PREPARATION FOR THE NOVEL CRISIS: A CURRICULUM AND PEDAGOGY FOR EMERGENT CRISIS LEADERSHIP.

Tom Pine

Submitted to the University of Hertfordshire in partial fulfilment of the requirements of the degree of Doctor of Education.

June 2017

ACKNOWLEDGEMENTS

I begin by recognising the support that my wife, Rosemary, has given me in my research project and throughout my career. This has meant some sacrifices on her part but her encouragement has been unwavering.

My supervisors have played a major part in helping me reach this point. William Fisher was my postgraduate tutor when I started on a university teaching career and over a coffee sowed the seed for attempting a doctorate. Professor Eddie Blass and Dr Rodney Day were my initial supervisors. Professor Philip Woods took over from Eddie as my principal supervisor when she moved to Australia and has patiently followed or nudged my changes in direction whilst providing encouragement and meticulous feedback. Eddie continued as my second supervisor and I was also greatly supported by their colleagues from the doctoral programme as well as the fellow students of my cohort.

My interest in crisis has been almost life-long and I have been influenced in my development and thinking by a great many people. Despite the scepticism that my chosen career inevitable cultivated I am proud to have been a Metropolitan Police officer in such an exciting global city as London. I worked with the best from all walks of life and services. After leaving the police, I was involved with international teams on EU funded aid projects in capacity building. I was humbled and inspired by those I met, many of whom work in unpleasant and sometimes personally hazardous conditions to prevent, prepare for, and respond to crises.

During my career, I have met many of the researchers that I now refer to in my own research. I can now fully appreciate their work and achievements and regret that their findings were not always valued or used.

ABSTRACT

The context for this study is the convergence of global trends and risks, especially environmental and social changes, with the interconnectedness of the modern world leading to new, larger-scale, and unforeseeable crises. This convergence has the potential for a shift from what the author describes as the current resilience paradigm to a new crisis paradigm, labelled the *novel crisis.* The proportion of the global critical infrastructure that is in private or non-state ownership exacerbates the challenges for crisis management systems and leadership. It means that a wider range of stakeholders will be involved, testing the skills and knowledge of the individuals confronting crises. This coincides with the changes to the nature and provision of Higher Education that are happening already or expected in the future and with changes to employment patterns and student profiles.

A case study analyses the immediate impact Hurricane Katrina had on New Orleans in 2005 as an exemplar of the novel crisis. Secondary data are used to explore the organisational response of the authorities and the initiatives and leadership networks that emerged to respond to that catastrophe.

There is still a need to improve and invest in conventional crisis management structures but the key to confronting future novel crises will be with the temporary networks that emerge of those with specialist knowledge, connections, or proximity to the event. An appropriate crisis leadership curriculum and pedagogy is developed from the literature and evidence from the case study to meet their needs.

CONTENTS

GLOSSARY OF ACRONYMS

9/11	In common usage to represent the terrorist attacks on the US on 11.9.2001
AGS	Alternative government structures
All-hazards	Inclusive hazards of nuclear war and civil emergencies
ANDROID	Academic Network for Disaster Resilience to Optimise Educational Development
APEL	Accredited prior experiential learning
BRONZE	Operational sector command level, geographic area or role based.
CADRE	Collaborative Action towards Disaster Resilience Education
CHE	Complex humanitarian emergency
COBR	UK government's crisis management facility in London.
CPD	Continuous Professional Development
DHS	Department of Homeland Security
DRC	Disaster Research Centre (University of Delaware)
EC	European Commission
EMBA	Executive MBA
EMON	Emergent Multi-Organisational Network
EOC	Emergency Operations Centre (US)
EPC	UK Emergency Planning College, Easingwold, Yorkshire
FEMA	Federal Emergency Management Agency
FRONTEX	European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union
GEC	Global environmental change
GOLD	Strategic level incident command/commander (UK)
HE	Higher Education
HEI	Higher Education Institution
ICS	Incident Command System
IGO	International Governmental Organisation e.g. EC, UN

INGO	International Non-Governmental Organisation
IPCC	Intergovernmental Panel on Climate Change
JESIP	Joint Emergency Services Interoperability Programme (UK)
LDWF	Louisiana Department of Wildlife and Fisheries
MS	Member State (EU)
NGO	Non-Governmental Organisation
NIMS	National Incident Management System (US)
Nonprofit	Funded non-state service provider
NRF	National Response Framework (US)
OECD	Organisation for Economic Cooperation and Development
PMC	Private Military Company (Mercenary)
PS	Participating State (European Civil Protection Mechanism)
RPL	Recognition of Prior Learning
SAGE	Scientific Advisory Group for Emergencies
SILVER	Tactical incident command /commander level (UK)
SITREP	Situation report
TMS	Transactive Memory System
WEF	World Economic Forum

TABLES AND FIGURES

List of Tables

List of Figures

CHAPTER I. INTRODUCTION

1. The Context and the Problem

We are left in no doubt by a daily barrage from the media and the global governance establishment that the world is a dangerous place with growing threats to our future wellbeing. An early warning came from Secretary General U Thant when he addressed the UN in 1969 that there were "perhaps ten years left in which to subordinate their ancient quarrels and launch a global partnership to curb the arms race, to improve the human environment, to defuse the population explosion, and to supply the required momentum to development efforts" (in Meadows et al 1972: 14).

A generation later, an assessment by the Reflection Group on the Future of the EU (2010) was equally pessimistic listing "a global economic crisis; ageing populations threatening the competitiveness of our economies and the sustainability of our social models; … the challenges of climate change and increasing energy dependence …. And on top of this, the threats of terrorism, organised crime and the proliferation of weapons of mass destruction hang over us" (p3).

We have stark statistics for 2015 with the UN recording 346 disasters, 22,000 deaths, damage estimated at 66.5 billion dollars, affecting 1000 million people (UNISDR CRED 2016). Although it is difficult to quantify events affecting the private sector we should not forget that whilst companies go bankrupt and directors move on, the employees and their families suffer, sometimes just as much as in a humanitarian crisis if there are no state benefits.

This research project originates from my career as a practitioner in fields related to crisis management, both operational and in policy development, and latterly as an academic. In the former I relied on experience and tacit knowledge largely ignorant of research that could have informed our operational planning. As a new academic, interacting with former colleagues that were now my vocational students, I became aware that the curriculum which included terrorism, natural and technological disasters, business continuity etc. seemed inadequate for their future needs. I also felt personally hampered by the lack of a supportive parent discipline with an organised knowledge base.

Early in my academic career Ackoff's (1979) concept of *messes* struck a chord with me and still rings true, that "managers are not confronted with problems that are independent of each other, but with dynamic situations that consist of complex systems of changing problems that interact with each other. I call such situations messes … Managers do not solve problems: they manage messes" (in Schon 1983: 16). The messes remain but we now have global risks (WEF 2016) or rather "the anticipation of catastrophe" (Beck 2016: 43) where "what was ruled out beforehand as utterly inconceivable is taking place – as a global event" (pxii).

I contend that there is a convergence of challenges, including

- Global risks such as environmental change (UN IPCC 2012; OECD 2011, 2014; UN ISDR 2015) with inherent social injustice (Beck 2016) which may lead to unforeseen, novel, and larger crises,

- the interconnectedness of the modern world (World Economic Forum 2016) which exacerbates the challenges for crisis management systems and leadership across a wider range of stakeholders, and tests the skills and knowledge of individuals confronting crises (Barnett 2004; Lagadec 2009a), where

- education in support of the higher-level problem solving and decision-making skills (Comfort & Wukich 2013) that are needed may be affected by changes to funding and delivery such as in the Higher Education and Research Act 2017 (Hubble & Foster 2017), changes to student profiles (Andres & Carpenter 1997, employment patterns (King 2008; HE Commission 2012), austerity policies (Hillman 2015), globalisation and competition (Fielden & Middlehurst 2016).

An issue for professional education is the gulf between practice and academia resulting in a lack of awareness among practitioners of the research, published or ongoing, and its usefulness. In my multidiscipline literature review I found that sometimes promising avenues of research reach conclusion without adoption or further development.

2. Crisis Concepts and Terminology

Crisis is an over-used word, having been adopted by the popular press in the same way that adjectives such as awesome, infinite and unbelievable have been trivialised. This is far removed from the dictionary definition of a crucial stage, a turning point or an

unstable period (Collins 1979). To add to this a number of expressions are currently used as though they were interchangeable namely, emergency, major incident, critical incident, disaster and catastrophe. This imprecise terminology, Shrivastava's (1993) "Tower of Babel" with "many different disciplinary voices, talking in different languages to different issues and audiences" (p33), has been acknowledged (Quarantelli 1998; Perry & Quarantelli 2005) and remains an obstacle to students and policy makers (Britton 1999; Jensen 2016).

Crisis management has been defined as "the sum of activities aimed at minimising the impact of a crisis" (Boin et al. 2013: 81) which include a wide range of measures such as risk assessment, prevention, evacuation, etc. and other non-routine measures (BSI 2011). The non-routine nature of crisis involves disruption and rapid change with leadership playing a large part as these activities take over from the everyday (Heath 1998; Coombs 2007; Crandall et al. 2010).

In practice, leadership is implicit in crisis management perhaps because as Gilpin & Murphy (2008) suggest management "implies a level of control … that does not exist in most crisis situations" (p7).   Uhl-Bien, Marion & McKelvey (2007) consider that both leaders and managers are the collective *administrative leaders* that "plan and coordinate" (p305) in crises. Some charismatic individuals may be strategic crisis leaders, for instance Mayor Giuliani after 9/11 (Giuliani 2002), although a network of hundreds of organisations supported the response (US National Commission on Terrorist Attacks upon the United States 2011).

Although there is a lack of consensus about defining crisis (Boin 2004; Lalonde & Roux-Dufort 2013; Alexander 2013) and that '*disagreement exists over whether or not such a consensus should be a goal'* (Dayton 2004:165) leading scholars in the field have speculated about a new emerging crisis phenomenon, using labels such as transboundary (Ansell, Boin & Keller 2010) meaning absence of time and spatial constraints; the prefix 'mega-' (Alpaslan & Mitroff 2011; Helsloot et al. 2013) and catastrophe (Quarantelli 2006) to denote scale; the poetic '*Terra incognita'* (Lagadec 2009) to represent unprecedented; and '*fractal'* (Topper & Lagadec 2013) as crises within crises.

Defining terms is an educational imperative but crisis has proved to be an elusive and shifting concept. To this end I distinguish between a crisis, that is, a real or perceived

extreme situation requiring decision-making under pressure, and the crisis *context*. The context includes emergencies, disasters and catastrophes whether natural, accidental, or malevolent (see Chapter II).

3. The Objective and Importance of the Study

It seems that new crises are more complex, without boundaries, more connected and interdependent, more destructive and "not just more of the same … something completely different, a totally new ball game*"* (Smet et al. 2012), a view echoed in high-level policy papers (IPCC 2012 & OECD 2014).

An event that had scale, novelty, and was trans-boundary was the impact of Hurricane Katrina on New Orleans in 2005. Afterwards the Bush Administration admitted "our current system for homeland security does not provide the necessary framework to manage the challenges posed by 21st Century catastrophic threats" (Townsend 2006: 52) and that was despite investment, restructuring, training, and exercising post 9/11.

The emergence of the novel crisis concept does not mean that conventional crises will no longer occur. There is still a need to improve and invest in formal crisis management structures including those who staff them. The question is whether we should do more of the same, that is more and longer training courses in risks and response with the danger of overloading the curriculum (Fry & Marshall 2002) or should we rethink our approach. With this in mind, I explore the context, curriculum, and pedagogy of crisis education to assist in preparing students, or as Lagadec (2009) put it "equip our future managers and citizens … in a world fraught with crisis and discontinuity?" (p483).

In future crises, as in Katrina above, the likelihood is that the responsible organisations will be the victim of events and their physical and human infrastructures degraded. In a crisis, hitherto esoteric subject-area expertise may be the key to resolving the crisis, especially given the proportion of the global life sustaining infrastructure e.g. water, energy, food, power and communications that is in private ownership and interdependent (Auerswald et al 2006).

4. Contribution to the Practice of Education

A professional doctorate is "driven by a desire to change practice in some immediate sense" (Scott et al. 2004: 157), in this case the education and preparedness of future crisis leaders and managers through a curriculum that is multi-disciplinary, in both an academic and professional sense, and fit for the future.

For practical reasons that range from resourcing to employment profiles, a new curriculum cannot expect to include the traditional systematic approach to hazards and risks, risk management, legislation, and who-does-what of conventional emergency management training (Emergency Planning Society 2008; JESIP 2016; EC 2016) and education nor the extended Homeland Security span of responsibility (McCreight 2009, 2014) but will focus on higher-order transferable skills that are generic and future-proof (Kiltz 2012; Jensen 2013; Comfort & Wukich 2013).

The premise is that crises, and especially future crises, require multi-disciplined and multi-organisational solutions and leadership. Although there is still a place for education programmes in emergency planning and disaster management for professionals in these fields there is a need for a growing range of specialists to be prepared for a role in this multi-organisational network response.

Few people employed as day-to-day leaders in organisations expect to be active crisis leaders so in a sense the skills are relevant to all who may find themselves unexpectedly in such a role, especially since there is a paucity of guidance in the vocational literature on crisis leadership as opposed to the protecting reputation through public relations.

There are hints in the literature of the skills and techniques that individuals who emerge as crisis leaders might draw on, many of which are based on transferable everyday behaviours such as: imagination and creativity; intuition and naturalistic decision making; improvisation and bricolage; ethical awareness and reflexivity. In the organisational setting this list might include committee skills and assertiveness.

Early studies in the USA (Quarantelli & Stalling 1985) described how families, neighbours and communities, including local industry and local professions, were the first to respond in crises. It seems reasonable that emergent pro-social behaviour in a crisis should be more effective with some form of organisation and leadership (Drabek & McEntire 2003; Tierney & Trainor 2004).

The means of delivery already exists in the form of the accredited Short Course or free-standing postgraduate module that could be available as an addition to any academic programme for the student's specialist or professional development.

5.. Methodology

A seminal paper on organisational crises by Pearson and Clair (1998) concludes with the stark caution "We cannot overstate the challenges of doing crisis management research" (p74). They go on to say something that I am familiar with at first hand, that "organisations are reluctant to open current or past wounds to external examination … furthermore, in the worst cases evidence blurs or dissipates as the afflicted organisation is reconfigured or dies…" (ibid).

The research approach taken was phenomenological (Saunders et al. 1997) with the advantages of explaining social life and being adaptable and the disadvantages of time consuming collection of data and its analysis, with the risk that "clear patterns may not emerge" (p74). The research strategy was a case study relying on secondary data from diverse sources.

6. Autoethnography: Insights and Bias

For many, doctoral research comes at the beginning of their career whereas my research is towards the end of a portfolio career that began when I joined the Metropolitan Police in 1967 as an act of rebellion following rejection by medical schools. After beat patrol, I went on to experience all aspects of policing from Special Branch to vice before specialising in public order contingencies. The latter included many tasks for which there was no statutory responsibility, e.g. natural and technological disasters, but where it was necessary to deploy officers in large numbers in unusual circumstances.

Mid-career after graduating from the London School of Economics I specialised in the then unusual policy area of futures and contingency planning, the latter from a multi-agency perspective. I became quite intimately involved in the aftermath of many major events and shared conference platforms with many of the researchers featured in subsequent chapters.

My police service was followed by consultancy, mostly in capacity building both overseas and domestic, forensic investigations, and then a post as the programme tutor

for the MSc Emergency Management at the University of Hertfordshire, one of the first of such courses in the UK before its closure in 2010.

As for my motivation, Scott et al (2004) described three distinct models for those undertaking professional doctorates, based on employability, career development, and *intrinsic-personal/professional affirmation* (p123), that is personal fulfilment and professional credibility which I like to think describes me.

Writing reflexively after a career spanning fifty years presents a considerable risk of being anecdotal. However, I can relate to Denzin (2001) who writes that "*meaningful biographical experience occurs during turning-point interactional episodes …*" (p145) which he subdivides into the *major*, *cumulative, illuminative* and *relived* epiphanies (p145-6). Setting aside marriage, births and bereavements, my *major* epiphany was winning a substantial undergraduate scholarship at the London School of Economics despite a dependant family. A less dramatic cumulative epiphany underpins my thesis. I presented a short paper, as the only practitioner, at an EU/UN conference (Pine 1995) which opened and closed with the same plea that I have heard repeatedly since: how can the findings of research be made available to assist practitioners? I was acutely aware of this issue in my own practice where UK national contingency plans were influenced by received wisdom rather than research such as that of Quarantelli, Dynes, Kreps, Perry, Perrow etc.

It must be clear from the above that account must be taken of the influence experience has on my research which "may be likened to light striking a crystal, reflecting different perspectives" (Ritchie & Gill 2007: 1) which change as I change.

7. Structure of the Dissertation

I begin in Chapter II. by discussing the issues of terminology already raised above and differentiating between emergency, state of emergency, and emergency powers. I conclude with a working definition of *crisis* and *crisis context*.

In the following two chapters I use the concept of the paradigm as research inspiration, identifying in Chapter III. two distinct paradigms, an historical *Need-to-Know?* period of Cold War secrecy and the current *Resilience* paradigm. The last of these is challenged by an emerging paradigm which I explore in Chapter IV.

In Chapter V. I review the literature on both elements of crisis management and crisis leadership although as I point out the term crisis management has been adopted by practitioners to include leadership because of the context in which it is employed. Whilst this chapter focusses on the formal or *established* organisations (Dynes 1970) in Chapter VI. I explore the various informal networks and forms of leadership that arise to cope with crises, i.e. emergent crisis leadership.

As we have seen above research into crisis and crisis contexts is difficult (Pearson & Clair 1998). In Chapter VII. I describe the path that my research took, including the influence that my pilot study had on my direction and choice of methods. I explain the ethical constraints on research in this field and justify the choice of a case study.

The next three chapters examine the case of the impact of Hurricane Katrina on New Orleans in 2005, an event that justifies the label *catastrophe* (Quarantelli 2006) and provides a context for a *novel crisis*. Chapter VIII. deals with the response of the establishment to the event, describing the political failure reported in post-event analysis (Townsend 2006; US Senate 2006; US House of Representatives etc.) and the degrading of the institutions responsible for response. This situation is picked up in Chapter IX. where I focus on the organisations and leadership, especially the networks that emerged to deal with the crisis. In Chapter X. I draw some conclusions from the case study before discussing in Chapter XI. how we might better prepare individuals for their role as emergent crisis leaders.

CHAPTER II. CRISIS: CONCEPTS, TYPOLOGIES, SYNONYMS, and POLICIES

1. INTRODUCTION

It is not unreasonable in any activity to define the various concepts of a subject and in education to expect the student to be at least familiar with them and at best, certainly in the physical sciences and jurisprudence, to be word perfect with the text and accompanying formulae, even down to the detail of punctuation for aspiring lawyers. One might therefore expect that this chapter would seek to accomplish this and indeed that was the original aim. I have had to review this and accept that the revised aim is to give the reader a sense of the complexity, confusion and frustration, sometimes even the futility, of trying to define the commonly employed terms that stem from the many academic disciplines and public policy organisations engaged in the field of crisis and similar phenomena. Indeed, even my choice of *crisis* rather than *disaster* in the last sentence conveys my bias. This confusion over terminology will only grow as the number of disciplines adding their contributions to the study of the serious and often existential threats facing the world grows. For example, university departments studying what is termed 'the built environment' as well those in civil engineering with an interest in major infrastructure risks are joining geographers in competition for attention and students. An awareness of the many and various definitions that the different disciplines bring and the reasons for this is nevertheless a valuable precursor to any discussion about the pedagogy since the problems facing us recognise no such boundaries and our students will be working in a multidisciplinary, ideally interdisciplinary, organisation.

A simple example of the interchangeable use of terms can be found in a handbook of the US Communicable Disease Centre, "When something bad or unexpected happens, it may be called an emergency, a disaster, or a crisis depending on who is involved, the magnitude, and the current phase of the event" (CDC 2014: 8). Yet in other contexts each term may have precise definitions and trigger different responses. The confusion is compounded by there not being a parent profession or academic discipline so that outdated and historic terms survive in literature reviews whilst new policy initiatives generate their own lexicons (Cabinet Office 2013d). The confusion has implications for professionalisation of those employed in the various complimentary fields, the body of

organised knowledge, and the education of future professionals and potential future emergent crisis leaders.

I conclude with a working definition of *crisis* and the *crisis context* which I will carry forward to the discussion of crisis management and leadership in subsequent chapters.

2. PERSPECTIVES OF CRISIS

The concepts of crisis and crisis management can be found in many disciplines such as interventions in illness, mental health, and social work (Thompson 2011) that deal with care for the individual. For my present purposes, I am concerned with the collective experience of crisis which falls into two camps, namely the private sector, dominated by profit and reputation protection, and the public sector which includes humanitarian issues and policy challenges, albeit often resulting from the actions and accidents of the private sector. I shall begin with a brief review of the former but thereafter my thesis will widen and focus on public life.

From the perspective of the private sector the concepts of crisis and crisis management were historically used in quite a different context, that is, reputation and profit. For instance, crisis was defined in a seminal work by public relations consultants Regester and Larkin (1997) as "an event which causes the company to become the subject of widespread, potentially unfavourable, attention …" (p131). In a definition, which marks the divide between private and public, a crisis was held by Millar and Heath (2004:2) to be an event that "has actual or potential consequences for stakeholders' interests as well as the reputation of the organisation suffering the crisis." Thus, it was likely to be something that impacted on brand reputation and sales, not human welfare or the environment.   In the same vein Gottschalk (2002:6) writing a 'pocket guide' for executives, defines a crisis on the opening page as "a significant business disruption which stimulates extensive news media coverage. The resulting public scrutiny will affect the organisation's normal operations and could have a political, legal, financial, and government impact on its business." There is no mention of people in this definition but it does represent a plethora of similar texts aimed at business executives (Curtain 2005; Heath 1998; Mitroff 2005).

A more scholarly approach was taken by James and Wooten's definition of "a rare significant and public situation that creates highly undesirable outcomes for the firm and its stakeholders" that requires "immediate corrective action by firm [company]

leaders" (2010:17). The supposed rarity of crises is reiterated by James et al. (2011: 458) but despite distinguishing them "as a distinct construct from run-of-the-mill business challenges" empirical evidence suggests that they are more common in some commercial environments (Engledow 2009) than might be supposed.

In 1998 a major insurance company commissioned a study by a Cambridge University research team (Knight and Pretty 1998). They examined the impact of real crises involving deaths, injury and damage in the context of IRA attacks on share values of several companies over a period. Their conclusions showed a positive correlation between the value of the company, or whether it had even survived, after twelve months and the performance of its management team in dealing with the crisis. Its findings were reinforced by a later report dealing with crises involving fatalities which reflected the post 9/11 environment (Knight and Pretty 2005).

Whereas from the literature cited above there was once a clear divide between the private and public perspectives, this has been blurred by the adoption of the *business continuity* policy (Collins 2006; Hiles 2007) across the public sector in the Civil Contingencies Act 2004 and the influence of human rights (ECHR 1950; 2010) and access to information (de Marchi & Funtowicz 1994). In respect of major crises, the divide has been largely superseded by the influence of the OECD in global risk management (Baubion 2013) and the "humanitarian marketplace" (Weiss 2013:4) of NGOs and both for-profit and nonprofit organisations, represented by the Private Military Companies (PMCs) that protect humanitarian (Liu 2010) and other interventions (Freeman 2015).

3. THE VERNACULAR OF CRISIS

3.1. Emergencies, disasters, and catastrophes.

There is not an accepted definition or concept of crisis and similarly the concept of disaster is also ill-defined (Quarantelli 1998) compounded by a "crisis-disaster-catastrophe" continuum (Aradau & van Muller 2013: 23) and various terms that authors have added in their attempts to clarify things. This often depends on the originating discipline, the jurisdiction, the media, and the public's perception, and yet these terms have serious connotations for human welfare. Apart from definition "classifying crises means shooting at a moving target as future events may differ from the incidents known today ... making almost any classification approach to be a transient procedure" (Gundel 2005: 106).

The problem is international. Business continuity management is also known in the US as *crisis management* and although English is the official language of the European Union when crisis and disaster are translated from the languages and technical documents of the Member States further interchange and overlap arises (Kuipers et al 2015). McLean et al. (2011) carried out research on homeland security education across Europe and found terminology a challenge quoting the political scientist van Deth (1998) that "The first problem encountered in international comparative research is the translation of terms and concepts … due to different cultural meanings" (p6) and that translation does not "capture the full richness of a concept or its relations to other concepts" (Roberts 1972:25).

An *emergency* is widely understood by the public and responders by virtue of the universal adoption of telephone alarm services but it has a statutory definition in many jurisdictions to justify public expenditure. In the UK, the Civil Contingencies Act 2004 defines *emergency* as an event or situation which threatens serious damage to human welfare, the environment, or the security, whilst in Part II of the same Act *emergency* becomes a potential trigger for the use of temporary unlimited *emergency powers.* Events anywhere can lead to declarations of a *State of Emergency* lasting years, quite different from the original meaning of emergency.

In the US one definition of a disaster is "an event in which a community undergoes such severe losses to persons and/or property that the resources available within the community are severely taxed" (Drabek 2004). This might fit well with an event befalling small-town America but does not meet the UN definition of "…a serious disruption of the functioning of society, causing widespread human, material, or environmental losses which exceed the ability of the affected society to cope using its own resources" (UN 1992). The American experience of 9/11 and Hurricane Katrina led to the term catastrophe, formerly used in describing the impact of nuclear war, to re-enter the lexicon, with Quarantelli (2006:1) summarising the thoughts of his peers that "just as disasters are qualitatively different from everyday community emergencies, so are catastrophes a qualitative jump over disasters*."* According to the US National Framework the criteria for a *catastrophic incident* is "… extraordinary levels of mass casualties, damage, or disruption" (US DHS 2008: Appendix). The London Strategic Emergency Plan is less precise and political defining a *catastrophic incident* as of "such a magnitude" as to require a minister to be involved (London Resilience 2010:3).

Crisis management involves the concept of a threshold described by Scraton, Jemphrey and Coleman (1995) as the moment in the context of their analysis of the Hillsborough Stadium disaster by which they mean "that relatively short period when a situation has gone beyond control and cannot be reversed" (1995:10). Similarly, in the context of the Cold War, Aradau & van Munster (2013) wrote that crisis "refers not just to the actual moment of decision but includes the broader prior strategic choices and actions" that prevent further development of the crisis or mitigate its impact. They consider that in a security context crises and disasters "circulate in a constant back-and-forth movement of practices and schemas of knowledge" (p26).

The understanding of crisis in the literature has changed over time. Keown-McMullan (1997) serves as an early benchmark when she examined the many descriptions (often a more appropriate term than definitions) of crisis beginning with Herman's (1972) three dimensions of "high threat, short decision time and an element of surprise" in an international relations context. After an extensive literature review she concluded that "a universally accepted definition of what constitutes a crisis has not yet been developed and it is unlikely to emerge in the near future" (Keown-McMullan 1997:8).

In 1995 the Kobe, Japan earthquake that killed 6,434 people was analysed by Heath (1995) revealing the extent of the unnecessary delays in response caused by cultural attitudes and lack of preparedness which may have contributed to the death toll. He relied on the contemporaneous observations of a journalist (van Biema 1995) and considered the 'magnitude' of such events not just in terms of scale but of "the number of major sub-event crises triggered by the impact of the event" (11) which chimes with the cascading effect of Pescaroli and Alexander (2015) below. Heath also discussed the need for "meta-strategic missions and objectives" not dissimilar to Marcus et al.'s (2006) later meta-leadership model discussed in Chapter VI, and perhaps ahead of his time he adapted the familiar medical triage priorities to a wide-area crisis management concept to prioritise rescue.

Since then there has been a change in thinking of both academics and practitioners about crisis in terms of both scale and complexity. Writing after the 9/11 terrorist attacks on the US, Hills (2002) coined the term *catastrophic terrorism* and sought to make sense of what seemed to be a paradigm shift in the threats facing modern society by using a model of a ladder of escalation from traditional to *compound* disasters. This label shortly proved inadequate for events such as the 2002-4 SARS epidemic, 2004

Asian Tsunami, 2005 London suicide bombings, and Hurricane Katrina 2005, that soon followed. Beck, in a re-evaluation of his new modernity theory (Beck 1992), commented on the spatial, temporal and social "de-bounding" (Beck 2002:41) of the War on Terror crisis to preserve internal security of the state rather than the traditional role of meeting external threats.

The de-bounding of crisis was followed-up by Boin and Rhinard (2008:3) who, examining the new phenomenon of transboundary crises in the context of EU enlargement, defined crisis as "a threat to core values or life-sustaining systems which requires an urgent response under conditions of deep uncertainty" with the caveat that this relies heavily on peoples' perception. This latter issue I argue is a very important element of crisis which I will return to later. They go on to describe a disaster as "a crisis with a bad ending" and a catastrophe as a disaster with unprecedented loss of life and damage, both rather subjective criteria.

The 'domino' effect has long been used by practitioners as a metaphor to represent a sequence of events, for instance in planning for industrial hazards (EC 2012), whilst Fuerth (2007:2) has drawn parallels with complexity theory, whereby "… seemingly small events can lead to massively consequential results."   A similar metaphor of cascading has also been used colloquially (Moynihan 2009) to describe the escalation of an incident and examined in papers by Buzna et al. (2007) and Berariu et al. (2015) in relation to infrastructure.   The concepts of *cascading effects* and the resulting *cascading disaster* were explored by Pescaroli and Alexander (2015) who underline the problem that underpins this chapter, in that "failure adequately to define terms starts to complicate objectives …" (p58). In keeping with Fuerth (2007) above they consider that cascading effects are complex and evolving and offer a definition of cascading disasters as "extreme events, in which cascading effects increase in progression over time and generate unexpected secondary events of strong impact" (p65). Cascading disasters are a contemporary research theme (Helbing 2013; Shimizu & Clark 2015; Pescaroli & Kelman 2016) with implications for future crisis management.

I began this section by defining an emergency but the extreme of this in every sense is the Complex Humanitarian Emergency (CHE) defined as a humanitarian crisis where there is a "significant breakdown of authority resulting from internal or external conflict" (UNIASC 2008:11) in which many die or are displaced but as Klugman (1999:1) adds "some may benefit". CHEs present the biggest challenge in that they are multi-

faceted crises with associated disasters that exacerbate each other and resist attempts at either resolution or humanitarian assistance, be it from NGOs (Stein 2001) or peace-keepers (Burkle 1999). There may be military conflict, insurgency, tyranny, corruption, underdevelopment and terrorism or all of them. There will probably be civilian casualties, and populations besieged or displaced; serious political or conflict-related issues, such as border disputes, that prevent or delay the delivery of assistance; inability of people to pursue normal social, political or economic activities; and associated personal risks for relief workers (Albala-Bertrand 2000).

3.2. Extending the vocabulary

Stepping aside from the above discussion, although I shall return to the concepts of transboundary and cascading crises, complex humanitarian disasters, and catastrophes in subsequent chapters this overview would be incomplete without considering some of the other ideas on crisis. An important concept that has come to the fore in practice in the past decade is the *wicked problem*. Urban planners Rittel and Webber (1973) addressing the perceived failure to solve social problems noted that it had been a serious error to think that the "social professions … could solve problems in the ways that scientists can solve their sort of problems" (p160). Thus, the problems that physical scientists focus on are described as *tame* where the problem can be identified and solutions sought even though they might be very complex and challenging. On the other hand, the *wicked* problem is unique, ill-defined and likely to be a symptom of another problem, distorted by political considerations, unlikely to have a long-term solution which will also depend on how the problem is framed. It is not wicked in the sense of being evil but as a mathematician might use it to describe resistance to a solution.

Many well-known writers have added their own neologisms including LaPorte (2005:2) with his *rude surprises* which he described as "those unexpectedly overwhelming events that alter things" with "punishing blows to the status quo." The insurance industry uses an equally colloquial expression of *pear-shaped phenomena* referring to relatively low probability but high consequence events that pose substantial risks to industry and the economy (AON Benfield 2013). Similarly, Mendoca et al. (2004:203) refer to the *wild card,* something that is improbable yet has serious consequences. The *Black Swan* metaphor caught the imagination in the last decade when its "rarity, extreme impact, and retrospective (though not prospective) predictability" was used as an analogy by

Taleb (2007: xviii) for financial and other crises that are recognised with hindsight. Alpaslan and Mitroff (2011) returned to the idea of a *mess* (Ackoff 1979 in Schon 1991:16) which they describe as a web of complex and dynamically interacting, ill-defined, and wicked problems (Rittel & Webber 1973) and are clear that "their definition let alone solution, cannot be found in any single field of inquiry or profession" and thus "every crisis calls for interdisciplinary, and even transdisciplinary, thinking" (2011: xviii).

3.3. Attempts to classify crisis: typologies and scale

Typologies offer a tool for identifying and ideally then managing the crisis and for the scholar a way of linking the perspectives of different disciplines. Typologies can be lists such as the early descriptive categories of Rosenthal and Kouzmin (1993) ranging from mine disasters to terrorism or the seven functional descriptors of Mitroff et al. (2004), that is economic, information, physical, reputation, natural disasters, human resources and deviance.

Perhaps the most well-known attempt was by Gundel (2005) who acknowledged that it meant "shooting at a moving target" (p106) but saw the value of the exercise as identifying the common features shared by different crises with a view to matching these against preventative measures or the response to such crises.

His crisis matrix identified four types:

1. *conventional* crises, which he describes more as incidents or emergencies,
2. *unexpected* crises, like the above but rare which tests the response,
3. *intractable* crises, can be anticipated but are difficult to deal with because of the attributes of the systems involved, conflicts of interest, and scale of harm, and
4. the largely unknowable *fundamental* crises e.g. future uncontained gene technology.

Whether the matrix could be of much assistance in preventing or responding to a crisis is doubtful but as a teaching aid it seems to be a useful way of stimulating discussion.

A typology that appears to have been developed from a military leadership perspective but which the authors seek to transfer to civilian organisations is that of Hannah et al. (2009) who propose a typology of five components of an *extreme event*. This, they

assert to be different from a crisis and define as "a discrete episode or occurrence that may result in an extensive and intolerable magnitude of physical, psychological, or material consequences to - or in close physical or psycho-social proximity to - organization members" (p898). The five-component typology comprised the magnitude of consequences, the form of threat, the probability of consequences, location in time and physical or psychological–social proximity. From a practice perspective, it is thought provoking, not least because of their misconception of crisis and I will return to this in Chapter IV section 2.1 when discussing leadership in extreme conditions.

Attempts to quantify disasters are many and varied but with limited value in informing the public, serving more as alerts. Foster (1980) used the concept of *community stress* which was the sum of deaths, injury, illness, infrastructure damage, and population affected, linking this to an event intensity of 1-12 and the corresponding designation of "very minor" to "catastrophic" (pp38-39). Another early attempt was the Bradford Disaster Scale (Keller et al. 1990) that measured fatalities on a logarithmic scale but it was not widely adopted. Except at the extremes neither scale has much bearing on the scale of the crisis that might arise from the event in question.

An illustration of the difficulty, even naivety, of the single discipline approach can be seen with Fischer's (2003) attempt to explain disaster by examining the scale of an event and confining himself to a sociological approach. He suggests that a linear view of a disaster would begin with the existing social structure suffering the impact of a precipitating event which causes the disaster. Eventually this leads to an adjusted social structure, as Fischer puts it "what disaster sociologists actually study is social (structure) change under specialised circumstances" (p94). However, Fischer confesses that he "has grown weary of fighting the vernacular" and that as far as the lay person is concerned, and this would include most responders, a disaster is "an occurrence causing widespread destruction and distress" as defined by the American Heritage Dictionary 1992 (Fischer 2003:94).

Many things are missing from Fischer's perspective on disaster including the complications inherent in the precipitating event, transboundary, domino and cascading effects, and surprisingly the affected community and its resilience. Continuing with a sociological approach Fischer goes on to propose a disaster scale based on two dimensions of disruption and he terms adjustment, involving ten levels or descriptors from "everyday emergency" (p1) through to the final level of "annihilation" (p10).

Fischer's disaster scale has not been adopted but rather like Heath's (1995) model of strategic crisis management which adapted the medical triage tool, such a scale may become useful both to communicate and to prioritise in the novel crisis landscape of the future (Chapter VI).

The Richter scale, M_L, is still referred to by the media to convey the magnitude of earthquakes despite having been long since replaced by the Moment Magnitude Scale, M_W, except for local events in the UK (British Geological Survey).   Other examples include the Saffir-Simpson Hurricane Scale, the Volcanic Explosivity Index, and the International Nuclear and Radiological Event Scale of the International Atomic Energy Authority which act as alerts rather than management aids, hence the stark description issued by the US Meteorological Service in 2005 of the likely impact of Hurricane Katrina (see Chapter IX).

The growing complexity and scale of crises and disasters fuels the search for other ways of assessing scale and judging the response. One attempt was the Initial Rapid Assessment (IRA) tool (UN IASC 2009) which aims "to enable faster and better multi-sector rapid assessment in the first few days of a sudden-onset crisis" (p2) but when trialled in the Haiti 2010 earthquake it failed (UN OCHA 2010). It has since been revised as the Multi-Sector Initial Rapid Assessment tool (UN IASC 2015) but is yet to be evaluated. This led to an alternative assessment tool being proposed by Byram et al. (2012), the Public Health Impact Severity Scale (PHISS), aimed specifically at Complex Humanitarian Emergencies (CHE). This uses the key humanitarian parameters of the Sphere Project (2011) known as *clusters*, namely water and sanitation, health, shelter and nutrition, as representing the scale of a crisis. Rubrics are designed around these that then provide data about the human scale and severity of the crisis. A predictable rubric to the layman is the number of excess deaths, that is, the number of deaths greater than that expected of a given population in normal circumstances. More chilling is the number of under-5 excess deaths which stands out from the other rubrics as the most strident alarm signal.

3.4. The UK: an exemplar of confusing terminology

In the UK, the proliferation of terms associated with crisis is a challenge. New policy initiatives generate new terms that may survive or be superseded, often complicated by regional and local adoption and uneven promulgation.

Incidents are initially dealt with at the lowest level by the appropriate organisation but when this proves insufficient a *Major Incident* is declared, defined as "an event or situation with a range of serious consequences which requires special arrangements to be implemented by one or more emergency responder agency" (JESIP 2016:8). A multi-agency strategic 'GOLD' group is convened for major events, often with political links. The legislation (Civil Contingencies Act 2004) refers only to an *emergency* however the accompanying non-statutory guidance is more creative.   In their guidance, the Cabinet Office (2005/2010) considered *local emergencies* as synonymous with *major incidents* but then described levels of *severe emergency* that would require activation of the government crisis management facility COBR, so named because it evolved from the very modest Cabinet Office Briefing Room A. Severe emergencies may be *significant, serious,* or *catastrophic,* the latter necessitating the Prime Minister's personal attention. A new term *disruptive challenge* (Cabinet Office 2010) was extended to *disruptive incident* by the London Resilience Partnership (2012) to describe such events as power outages and industrial action. The London Strategic Emergency Plan uses the above terms but defines a *catastrophic incident* as where "the Designated Minister is of the opinion that it [the incident] will require a specific or exceptional response" (London Resilience 2010).   The reconstituted London Resilience Partnership, represents a wide range of power, transport, water and other utilities and it is the managers and technical experts of these second-tier non-emergency services that may have an increasingly important part to play in future contingencies.

In contrast to the above the current UK doctrine is quite clear about the two phases of an emergency that is *crisis management* and *consequence management*, defining crisis management as "the phase of the response that attempts to prevent or avert an imminent emergency" and listing examples such as hostage negotiation, evacuation, and informing the public. It is noted that the duration of the crisis management phase can vary from a few hours or a few days in the case of an accident of explosion, or a few weeks or even months following an outbreak of a human or animal disease, until the situation is brought under control (Cabinet Office 2010 para 1.5).   The *consequence management* phase covers the restoration of services and infrastructure, and dealing with hazardous waste (ibid). The issue of lack of clarity is important because the events in question are life threatening, even involving mass casualties, as well as threatening the long-term stability of government and the economy.

3.5. Emergencies and emergency powers

The UK provides a useful example in the Civil Contingencies Act 2004 of the difference between emergency, and other synonyms, and crisis. An e*mergency* is defined but no powers to manage an emergency are given, only to plan. Part II of the Act is quite different and deals with *emergency powers*, powers that are of "awesome scope" according to Walker and Broderick (2006: 153). These powers which are time limited would be invoked ideally by an Order in Council or, to avoid serious delay, by a senior Minister. Whilst subject to subsequent parliamentary scrutiny the scope of the potential regulations is wide and can be further extended by resort to the Royal Prerogative (Maer & Gay 2009; UK Ministry of Justice 2009; Blick 2014). Walker & Broderick (2006) conclude that the Civil Contingencies Act 2004 is "the most powerful and extensive peacetime legislation ever enacted … Indeed, it contains within it the tools for dismantling civil society" (p188).

There is a potential paradox between the concerns of Gross and Ni Aolain (2006) who warn "if a time of crisis permits stepping outside the legal system, no limits – and certainly no legal limits – can be set on how far such deviations would go and how wide in scope they would be" (p147) and the suggestion by Borodzicz (2004; 2008) that successful crisis leadership is almost synonymous with rule breaking.

The European Convention on Human Rights (ECHR 1950) acknowledges the need to accommodate States in times of crisis by the derogation in Article 15. An emergency justifying derogation had to be "a situation of exceptional and imminent danger or crisis affecting the general public, as distinct from particular groups [e.g. political party, corporation] and constituting a threat to the organised life of the community …". In other words, this is a curb on the authorities who might for instance declare a state of emergency because of legitimate protests or trade union gatherings (Gross & Ni Aolain 2006:249).

This brings us to Article 2 - Right to Life, that asserts "Everyone's right to life shall be protected by law. No one shall be deprived of his life intentionally save in the execution of a sentence of a court …" (ECHR 1950:2.2). It is a positive obligation (Akandji-Kombe 2006) but with exceptions that might be applicable in a crisis, especially if emergency powers are used, such as self-defence, riot, and insurrection (ECHR 1950: 2.2).

Human rights were the driving force behind the establishment of a worldwide early warning system (UN Secretary-General 2005) consistent with the national and international duties to inform the public of risks e.g. Civil Contingencies Act 2004, Seveso Directive (EC 1982; 2012), Aarhus Convention (UN 1998), and REACH (ECHA 2010).

4. CONCLUSION: WHAT IS A CRISIS?

In this chapter I have explored some of the many concepts and attempts at defining crisis which both indicates the complexity of the topic and the challenge for practice. The problem of the lack of agreed terminology was recognised by Britton (1999) as "a major cause for confusion and distancing between the researcher and the practitioner" (p230) whilst Flin (1996) got around the problem of "terms used interchangeably to describe equivalent events" (p2) by adopting whatever term her source used. A symptom of the challenge in defining the field is well illustrated by Blanchard's (2008) collection of definitions, acronyms, guidance and legislation running to 182 pages to support FEMA on-line training courses. Later, Alexander (2013), when discussing the teaching of the subject area, skirted the issue by saying that the terms "crisis, emergency, and disaster will be used more or less synonymously" (p61) for the sake of simplicity.   A contemporary survey by Kuipers et al. (2015) found a common understanding of crisis across Europe, but the terminology and procedures of individual Member States varied greatly (p9).

A striking example is given by Shrivastava (1987) in his case study of the 1984 Bhopal, India industrial disaster which killed 3,800 people (Broughton 2005). He noted that the terms disaster, tragedy, and massacre were used by the victims, whereas the Indian government described it as an *accident* and the report by Union Carbide, the operators, referred to it as an *incident*. More recently, Laakso and Palomaki (2013), writing about the operational importance of common understanding, claimed that "the concept of an emergency is quite clear" but then went on erroneously to say "in this paper we treat the concept of disaster as synonymous with a major accident" (p1704).

In view of the above I am reluctant to add to the many interpretations, but to proceed I will select key elements from several authors to construct a working definition of crisis. I begin with the traditional meaning of "a situation in which important decisions involving threat and <u>opportunity</u> [my emphasis] have to be made in a particularly short time"

(Shaluf et al. 2003:24) and where the event, be it an emergency, disaster or catastrophe is an "agent of the crisis". Thus, a crisis is "more comprehensive than the disaster*"* (31). To this I would add Heath's (1998) list of characteristics: a threat to resources and people, a loss of control, limited time in which to respond, the need for rapid decision-making with unreliable or missing information, where the response required often exceeds the available resources. These characteristics remain valid but to them must now be added the drivers of a rapidly expanding and increasingly digital media (Bowman & Willis 2003), citizens' constitutional rights to information, and accountability manifested in litigation, public inquiries, and election defeats (Boin et al. 2008). I would also add *extreme context* (Hannah et al. 2009) to distinguish crisis from its sometimes trivial use, and add the "host of venal factors" (Bohn 2004: xiv) of crises associated with corruption, conflict, organised crime, and terrorism. Thus:

> *A crisis is an extreme situation requiring timely decision-making about the response to real or perceived threats and opportunities, often exceeding available resources, and based on limited or unreliable information, with a risk of accountability and personal consequences. Crises arise from the failure to anticipate, understand, and prepare for threats, manifested in emergencies, disasters, and catastrophes, be they social, economic, political, or environmental.*

In this definition decision-making implies leadership and to distinguish crisis from the other terms discussed in this chapter that many authors use as though there was no difference, I will return to Hannah et al.'s (2009) idea of *extreme contexts.* This they define as an environment where events are occurring or are likely to occur with an "intolerable magnitude" of consequences (p898) so that in the same vein emergency, disaster, and catastrophe provide the *context for crisis*. The separation of crisis from the context such as a disaster is crucial to my argument for a trans-disciplinary approach to preparing potential crisis leaders. However, this separation is not easy to maintain because the respective literature overlaps and terminology is used interchangeably.

In subsequent chapters I explore the past, present, and future paradigms of crises and the response before addressing the notion of crisis management, widely understood by practitioners to encompass many leadership attributes, especially decision making, because of the unusual circumstances in which it is initiated i.e. to prevent or avert an emergency (Cabinet Office 2010, 2013e).

CHAPTER III. PARADIGMS of CRISIS

1. INTRODUCTION: PARADIGMS OF CRISIS AS RESEARCH INSPIRATION

This chapter is based on the proposition that to explore future developments and associated crises we need to understand how we have arrived at the position today. This approach is given credence by Hart's contention that "a basic requirement for the research student is that they should understand the history of the subject they intend to study" and that this "serves the purpose of providing a perspective on how the subject has developed and become established …" (1998:27).

Reflecting on my long career I was able to link the research problem to my own experience of events and their context, some of which could be described as step-changes, 'sea-changes', or paradigm shifts. It seems to me that information and knowledge have been the driver of change and it is this that I seek to demonstrate in this chapter, identifying two paradigms. The first I label with an interrogatory *Need-to-Know?* This was the answer throughout the Cold War and beyond to requests for information, be it from co-workers, the public, journalists, researchers, and even Parliament. Whether and what to tell the public about risks and action they might take was also questioned (Hennessy 2002, Parker & Handmer 1992). This paradigm was gradually replaced by the still dominant *Resilience* paradigm, a period associated with greater access to information, both through government policy (Pursianen 2008; Cabinet Office 2004 & 2015) and the global media machine (Bowman & Willis 2003; Gowing 2010) augmented by social media (Van Alstyne 2011; Veil et al. 2011).

The concept of a paradigm shift, rather like crisis, is a convenient and widely used and abused term. McEntire et al (2002) sidestepped this with the caveat that "in order to limit excessive repetition the terms approach, concept, perspective, paradigm, model and policy guide will be used interchangeably through this article" (p277). Paradigms in research refer to philosophy and choice of methodology (Hammersley 2012; Tracy 2013) but here I will use the paradigm concept to place the understanding and application of crisis concepts within a temporal context. This use of the paradigm concept within research has been used for example by Sudmeier-Rieux (2014) on development and Welsh (2014) on governance.

Thomas Kuhn in the preface to his seminal work, *The Structure of Scientific Revolutions* (1962) defined paradigms as "universally recognised scientific achievements that for a time provide model problems and solutions to a community of practitioners", where as he later explains practitioners are the community of a hundred or so natural scientists working in a subject area. The paradigm concept was adopted for the social sciences by Ritzer (1979), a sociologist, who defined it as "a fundamental image of the subject matter within a science. It serves to define what should be studied, what questions should be asked, how they should be asked, and what rules should be followed in interpreting the answers obtained …" (1979: 7).   Ritzer was not without criticism, summarised by Eckberg and Hill (1979) as including his application of paradigm to a discipline rather than a field and describing the concept in sociology as "nebulous" and referring to a "general theoretical perspective" (p929).   Nevertheless, this suits my purpose and provides a useful instrument for looking at the radical changes that have taken place in crisis policy and its context. The link between crisis and paradigm shift was explained by Henry Kissinger (1977: 182) as those "brief moments when an old order is giving way to a pattern new and unseen; these are times of potential disorder and danger; but also opportunities for fresh creation."

2. THE *NEED-TO-KNOW?* PARADIGM (1945 … 1995)

It is not intended that the paradigm argument should be obfuscated by much history of the Cold War but as Brodie (1949) said, the threat of nuclear war had "transformed all recognition with the past... the change being so unprecedented that historical comparisons fail us completely" (in Aradau & van Munster 2011:18). The first use of an atomic weapon, 'Little Boy', by the US at Hiroshima on 7th August 1945 and the global realignment of nations at the end of World War II is an easily identified historical marker that signalled the start of the Cold War. However, although the paradigm may have an easily identifiable start, closure is more difficult to date because aside from the proliferation of nuclear weapon technology and the desire to acquire it (CIA 2015) attitudes lingered with slow change beginning in the 1980s.

From a crisis perspective, two things mark the Cold War as a distinct paradigm. The first, which was an over-riding characteristic obvious at every level of public administration, was secrecy (Hennessy 2010). Secrecy extended to all areas of public life including industry, public health, pending privatisation, and restrictions on parliamentary questions, summarised by Parker & Handmer (1992:264) quoting Michael

that "...Britain is about as secretive as a state can be and still qualify as a democracy" (1982: 9).

Not only did secrecy exist administratively from where I remember the *Kneed-to-Know?* catch phrase but as a paternal culture to protect the public, including the electorate and shareholders, from disturbing information at a time when there was as yet no right to be informed of risk and nor were the positive rights under the European Convention on Human Rights widely recognised (Akandji-Kombe 2006) (see Chapter II). This was in the context of the profound changes taking place in society, in large part due to the social and economic upheaval caused by World War II described by Judt (2007) in his history of post-war Europe.

To the scholar and the practitioner, the *Need-to-Know?* paradigm could be observed as a shift in policy from Home Defence (later called civil defence) to civil emergencies (Alexander 2002a). Initially the former was the dominant influence with civil emergencies playing a much lesser, secondary role. Various drivers were to inexorably change this including some notable emergencies and the policy changes that followed them (Barrett & Howells 1992), a global media, industrial safety legislation (EC 1982), human rights (ECHR 1950), civil disorder that was often racial or industrial in origin (Reiner 1998), and geopolitical changes with their associated complex emergencies (Weiss 2007).

The decisions that surrounded the use of an atomic weapon by the USA were analysed by Kurzman (1986) who had access to those involved who "...were caught up in the merciless machine activating the bomb, some reluctantly, others willingly, most unwitting" (p11). The lesson from this is that if human weakness was a factor in something as important as Hiroshima then we must be aware of it in modern crisis decision making.

The technology of the atomic bomb was soon superseded by the thermonuclear bomb. At first sight, the aim of the prevailing paradigm in crisis management during the Cold War period would seem to be the avoidance of mutual destruction and maintaining the balance of power, failure referred to by Garwin (1979) as a condition of "crisis instability" and a major risk of war. If that strategy failed, the UK was to rely on Home Defence which had as its core objective protection of the machinery of state and its ability to make war where Civil Defence was the role played in this by local government.

The protection of the population was considered at the beginning of the Berlin Crisis of 1948 as revealed in a declassified Cabinet paper, *Background and Policy for Civil Defence Planning 1948* but effectively dismissed as neither shelters nor dispersal would be an "economic or practical possibility" (Hennessy 2002:125). According to Grant (2009) between 1948 and the collapse of the Soviet Union at no time did the UK have home defences adequate for a nuclear attack.

However, to think that crisis management was consumed by the 'mutual destruction' issue is an oversimplification. Thermonuclear war was the existential threat that created what could be thought of as the ultimate parameter within which the key crisis management skill was that of 'brinkmanship' (Dulles 1956).

For three decades, little consideration was given to the fate of ordinary civilians in contrast to the central government facility hidden under Box Hill, Wiltshire, code named 'TURNSTILE', and the eight similar regional bunkers from which it was planned that the UK's elite would govern a post-attack Britain (Hennessy 2010). This was in contrast to the strategy of discouraging evacuation by the population and the advice to improvise a shelter under the stairs as described in the leaflet issued to all households (Home Office 1980), popularised by the cartoonist Raymond Briggs (1982). The secret arrangements were exposed by the investigative journalist Duncan Campbell (1982) who quoted the anonymous rationale from the *North-East Thames Regional Health Authority War Plan* to justify the government's selective policy

> "If all the great trees and much of the brushwood are felled a forest may not regenerate for centuries. If a sufficient number of the great trees is left however, if felling is to some extent selective and controlled, recovery is swift. In its way a nation is like a forest and the aim of war planning is to secure the survival of the great trees".

The historian Peter Hennessy whose team was given access to the tranche of declassified Cold War archives for research purposes captured the sense of the ridiculous in the planning for a post attack Britain as

> "Eleven shrivelled irradiated fiefdoms ... theoretically governed by men in bunkers and probably ruled, in reality, by armed soldiers and policemen with ultimate powers over life and death ... is too ghastly to contemplate. But

contemplate it, in secret, the planners were regularly required to do. At every level one finds scepticism tinged with irony …" (Hennessy 2010: 208).

Looking back Dory (2003) summed up the public's attitude to civil defense in the US as a mixture of indifference and denial whilst others "considered a program that might not save all people to be immoral" (p41).

It seems that it was not only in the UK that the *Need-to-Know?* paradigm prevailed. Maurice Grimaud, the Paris Prefect of Police in 1968, ruefully remembered the secrecy of the time,

> "Not that we hadn't made very lovely plans long before … once signed and stamped with 'Secret' seals they were apparently all locked carefully in safes full of confidential documents located in each ministry … it wasn't just by coincidence that they generally bore names inspired by mythology – rarely was an organisation more mythical than that one" (Grimaud 1977 in Lagadec 1993: 57).

The picture painted by Grimaud is one that was very familiar in the UK for several decades and the idea of the mythical plan was later picked up by Clarke (1999) in his analysis that "organisations and experts use plans as forms of rhetoric, tools designed to convince audiences that they ought to believe what an organisation says. In particular, some plans have so little instrumental utility in them that they warrant the label *fantasy documents*" (p2).

Much of Clarke's thesis was derived from examination of the Cold War civil defence plans published by the authorities in the USA. However, unlike the UK, from the outset of the Cold War the American authorities were open to dual use, later to become FEMA's *dual-hazards concept* under President Carter. Although the policy appears to have been subject to the same wrangles over funding as the permissive powers in the UK in 1981 FEMA's policy was that "the funds must be used primarily for attack preparedness purposes but may be used for emergency preparedness support as well" (p125). There was open high-level support for this policy as in this clear statement in 1975 by James Schlesinger, Secretary of Defense: "Civil defense readiness generates, as a bonus, an improved capability on the part of a State or local government to conduct coordinated operations in the event of peacetime emergencies" (p124).

From Home/Civil Defence to Emergency Planning

The Civil Defence (General Local Authority Functions) Regulations 1983 required local authorities to carry out many functions but prohibited the building of emergency centres. An indication of a change in attitude to secrecy in the UK was signalled when the socialist led Greater London Council ignored the above regulations and diverted the civil defence budget into commissioning the *Greater London Authority War Risk Study* (Clarke 1986) and publishing the report. Although the latter exposed the inadequacies of London's civil defence provision, because of its provenance it was less influential than might be expected and was eventually lost in the politics of the day (The Times 1989). However, it is a chilling reminder of Cold War planning which has contemporary lessons in its examination of urban social behaviour under an extreme threat and the risk to London should the flood defences be attacked (pp158-165).

The concept of *all hazards* planning, all hazards in addition to war that is, emerged alongside rather than replaced war planning. Local authorities, hitherto constrained by the Civil Defence Act 1948, were "permitted", but not required, under the Civil Protection in Peacetime Act 1986 (Home Office 1986) to use such resources when a disaster was anticipated, imminent or had happened. This was only three years after local authorities were required to undertake civil defence planning and "permitted" did not include a duty to make emergency plans or carry out risk assessments. Under this policy civil defence planning and assets could be used in the response to civil emergencies but the reality became evident as the UK experienced several lesser emergencies.

The late 1980s and early 1990s have been described colloquially as '*The Decade of Disasters'* because the United Kingdom suffered a string of transport accidents, pollution events, urban disorders and crowd disasters (Parker 1992).   The same colloquial expression was used for the US by Larabee (2000) for major technological disasters during this period. Larabee opens her book of the same title describing the period as "signalling an age of limits" (pIX) meaning our failure to acknowledge technological limits and an exemplar of the shift from the then *Need-to-Know*? crisis paradigm.

The Cold War began to thaw with the collapse of the Soviet Union and the televised spontaneous demolition of the Berlin Wall by citizens in 1989. Understandably across

the world there was a period of upheaval but throughout this the crisis management arrangements of the UK remained unchanged, still largely secret and without any release of budget for civil emergencies in the peace dividend. In London, there was no formal end, more a withering away creating a hiatus in policy and practice. For instance, in 1990 in a local unilateral decision Home Defence training for police inspectors was given over to a presentation on major incident inter-agency coordination whilst shortly after this the secret *Police War Duties Manual* became a curiosity and its planning merged with other more pressing everyday contingences.

Throughout the period social change was marked by demonstrations and sometimes civil disorder from the 1958 Notting Hill Race Riot, the 1981 Brixton Riots and urban disorders in the provincial cities, landmark industrial disputes such as the 1984 'Battle of Orgreave' (Hernon 2006), to the London Poll Tax Riot of 1990. The *Scarman Report into the Brixton Disorders* (Scarman 1982) raised two issues: the need to include communities in the development of policing policies, and secondly recognition of the "need to deal swiftly and firmly wherever [disorder] may break out" (p153), a response to the criticism that police had not been effective in dealing with the disorder. The significance of public order policing was the increasing need for police to operate temporarily in paramilitary formations, the opposite of the legendary constable on the beat. This provided a resource and later a command and communication structure to fulfil the police coordination role in the absence of any other resource.

The Review of Civil Emergencies 1989: a false dawn

In 1988 the Home Office circulated a discussion paper followed by a seminar for invited participants (Handmer & Parker 1992). Accordingly, it was agreed that "the basis of the response to particular disasters should remain at the local level: it is here that expertise and knowledge exists ..." (p27) and the plea from local authorities for a statutory duty to plan for civil emergencies was refused. In what was seen as a positive step a new Civil Emergencies Adviser was appointed; reporting directly to the Home Secretary but without powers. Brief guidance (Home Office 1992) intended to link together the many existing single service emergency management manuals into a doctrine labelled "the combined response" (pp4-10) was later published.

Many were critical of the Review, seeing it as "... essentially a document protecting the existing system" (Parker & Handmer 1992: 70) whilst Milne-Henderson (1992)

compared the apparently complacent attitude of the UK with the progressive attitude of Australia, Canada, and Belgium. The political context and why the *Need-to-Know?* paradigm was slow to give way was made clear by correspondence from the County Emergency Planning Officers' Society and the Society of Local Authority Chief Executives (Gainsford 1992) to which the Times leader on 15 August 1989 responded, "… The old GLC so politicised emergency planning as to refuse to sanction civil preparedness for a nuclear attack."

In the policy and political vacuum that existed in London those involved in the operational response had been forced to develop their own systems. Although there had been an early typewritten memorandum, in 1993 the London Emergency Services Liaison Panel circulated its joint *Major Incident Procedure*, now in its ninth edition (LESLP 2015). Although originally a grass-roots initiative the manual and the Gold-Silver-Bronze command structure that it promulgates has been used at all pre-planned major events and emergencies in London since then and has been widely adopted in other jurisdictions.

3. PARALLEL POLICY STREAMS: THE INFLUENCE OF EUROPE

The *Need-to-Know?* paradigm did not just affect officials and the public but extended across departments and ministries. This 'stove pipe' (Dolk & Euske 1994) or 'silo effect' (Fenwick, Seville & Brunsdon 2009) was encouraged by the *Secret State* (Hennessey 2002) and inadvertently by the *Lead Government Department* policy (Home Office 1992; Cabinet Office 2004, 2010, 2011a). However, the influence of Europe (Knill 2001; Radaelli 2004) had a surprisingly major influence on UK crisis management through regulation, exchange of knowledge, and European solidarity. Thus began the shift from the control of information and paternalistic protection of the public towards the provision of information to enable officials to assess risk and citizens to take steps to protect themselves - features of the Resilience paradigm.

The explosion and release of toxic dioxin in 1976 from a factory near Seveso, Italy, gave its name to the Seveso Directive (EC 82/501/EEC) which required that Member States "shall ensure that persons liable to be affected by a major accident ... are informed in an appropriate manner of the safety measures and the correct behaviour to adopt in the event of an accident" (Article 8). The Directive, which was transposed into UK law by the CIMAH (Control of Industrial Major Accident Hazards Regulations) 1984, led to the

first statutory duty in the UK for local authorities and the emergency services to plan, consult, exercise, and inform the public, albeit in limited contexts.   The regulations were implemented by Local Authorities and overseen nationally by the Health and Safety Executive (HSE) but there were few systemic links with practitioners concerned with other risks for example flooding, public health, transport, and counter-terrorism since they were from separate organisations with "parallel agendas" (Gregory 2007:204).   The public information requirements were strengthened further in the Seveso II Directive (96/82/EC), subsequently implemented by the COMAH (Control of Major Accident Hazards) Regulations 1999.

Although for our purposes public information was the most revolutionary idea raised by the Seveso Directive other elements were just as radical. It defined a *major accident* (Article 1) ten years before London's *Emergency Procedures* (LESLP 1993) or the Home Office (1992) defined a major incident and two decades before there was a statutory duty to exchange information between responders (Civil Contingencies Act 2004). Where civil emergency planning had hitherto been a moral obligation it was now a statutory requirement, albeit only in limited contexts.   Other similar Directives for hazardous technologies such as pipelines, nuclear facilities, aviation, railways and bio-technology institutes followed as did concepts such as risk assessment but still not in mainstream emergency planning.

European safety initiatives also impinged on terrorism contingencies, a good example being the problems posed by bomb threats to the London Underground system. On 19 February 1991 two bomb alerts at separate stations on the Central Line that later proved harmless caused seven fully laden trains to be trapped in deep tunnels and it took several hours to evacuate the 6,000 passengers (HSE 1991: 2).   The HSE commissioned Sir Brian Appleton to urgently carry out "... an inquiry into the health and safety aspects of stoppages caused by fire and bomb alerts ..." (HSE 1992). He approved the use of quantified risk assessment to reduce unnecessary fire alerts but rejected its use for bomb threats instead relying on better public information which is still in force today.

The public's right to information in the Seveso Directive Article 8 provision was challenged for fear that terrorists could use the information to better target their attacks given the 1995 Tokyo sarin attack (Kaplan 2000) and the subsequent fear of CBRN mass casualty attacks (Smithson & Levy 2000). The US Government Accounting

Office (US GAO 1999) warned that "toxic industrial chemicals can cause mass casualties and require little if any expertise …" (p21). This issue is still unresolved although there is now provision for national security derogation in the latest Seveso III Directive (EC 2012) implemented in the UK by the revised COMAH (Control of Major Accident Hazards) Regulations 2015.

Perhaps one of the most profound generic influences on practitioners was the Framework Directive on Safety and Health at Work (EC89/391) partly transposed to the Management of Health and Safety at Work Regulations 1992. Its scope was wide reaching and applied to employers, individual managers and operatives. A structured risk-based approach became mandatory including *in extremis* operations such as prison riots and hostage taking, replacing the hitherto ad hoc planning (Wells 1995). Full adoption of the Regulations was resisted for some time, over a decade in some cases, by organisations that claimed exemption, notably in disasters (HSE 2001), police operations (HSE 2009), and fire service operations (HSE 2010). It was a learning process for all but the importance of transparency, providing information to those that need it and publishing the results of the considered examination of hazards and risks marked the decline of the *Need-to-Know?* paradigm and the gestation of an affirmative *you do need to know this and why* era.

A serious explosion and fire at the Buncefield Oil Storage Depot in Hertfordshire on Sunday 10.12.2005 was a significant event. Although there were no major injuries because few workers were on site, the damage was extensive. The toxic plume crossed to Europe and a largescale mobilisation of UK emergency services was required (Hertfordshire FRS 2006). It was the subject of a lengthy inquiry and report to the European Commission with long-term disruption and distress to surrounding communities and criticism of public information and communication (Buncefield Major Incident Investigation Board 2006). The issues raised were instrumental in the adoption of the Seveso III Directive (2012) which goes much further than previous directives especially in terms of enhanced public information.

The Civil Protection Mechanism and European crisis management

The transposition of European environmental protection and public information directives into UK legislation had discernible influence on domestic contingency planning and the shift away from the secretive *Kneed-to-Know?* paradigm. A less

obvious influence was the emergence in Europe of *civil protection*, first mentioned in the 1957 Treaty of Rome as an activity under the catch-all Article 3(u) "measures in the spheres of energy, civil protection and tourism." There was little activity until 2001 when the European Community Civil Protection Mechanism was established (EC 2001). Later its remit was extended to humanitarian interventions in third countries (EC 2005) and was further reinforced in article 176C of the Lisbon Treaty (EC 2007). Following the activation of the Mechanism to Banda Aceh 2004 and New Orleans 2005 several proposals were put forward by ex-Commissioner Barnier (2006) which led to further development of its capacity as an instrument for external crisis management (EC 2012, 2014).

The Civil Protection Mechanism is a practical tool. It coordinates the deployment of resources that make up the **European Emergency Response Capacity (EERC)**, from a well-resourced **Emergency Response Coordination Centre (ERCC)**, to both Europe and beyond its borders in humanitarian aid. The response capacity is made up of trained operatives from MS operating in modules. These are self-sufficient units such as fire-suppressant aircraft with their crew and spares, field hospitals, and urban search and rescue teams with their heavy equipment.

Until 2001 the capacity of the UK to cope with either a natural disaster such as flooding or the aftermath of a terrorist attack was limited yet ironically some fire fighters and paramedics were well established international volunteer rescuers in NGOs affiliated to the **International Search and Rescue Advisory Group within the UN**. However, investment by the *New Dimension* programme in both skills and equipment for the fire service led to the adoption of the module concept for urban search and rescue teams, mass decontamination, and high-volume pumps, the latter delivered in time for the 2005 Buncefield fire. As part of the European bi-annual exercise programme all elements of the Mechanism, from the trigger request to the ERCC in Brussels to deployment of the international response, were exercised in the UK in 2010 for an earthquake scenario. For the host nation, it revealed issues of data transfer and liaison at strategic level, and   ignorance at operational level (Hertfordshire FRS 2011).

4. THE RESILIENCE PARADIGM

4.1. The introduction of *resilience* policy

The *Need-to-Know?* paradigm did not end neatly with the end of the Cold War and, as we have seen, nor did civil defence morph seamlessly into civil emergency planning. Similarly, the new paradigm which for reasons that will become clear I have labelled the *Resilience Paradigm* cannot be ascribed to any particular driver be it the New Labour Government elected in 1997, growing *Europeanisation*, mentioned earlier, the general clamour for reform following the *Decade of Disasters*, or the conflated threats of weapons of mass destruction (WMD) and international terrorism. Information, that is its availability, accessibility, quality and quantity, and the realisation of the state's limitations in terms of resources and organisation were probably the drivers for the step change or paradigm shift.

In 1997 the outgoing Conservative government had taken steps to reduce the size of the Civil Service and modernise it whereas the new government had planned extensive programmes where the state would play an important part in public and even private life (Richards 1996). As far as civil emergency planning was concerned, apart from acting on promises made in opposition such as the public inquiries referred to below, reform was slow in coming on "this low policy priority and, potentially, financial black hole" (Rogers 2011:93). Early in the new Millennium a number of crises were handled badly and caused embarrassment to government, namely flooding in 2000, a fuel 'crisis' caused by non-violent protests by the haulage and farming industries, also in 2000, and the 2001 foot and mouth outbreak. All were managed by separate government departments and none was recognised as a crisis until later.

4.2. Resilience

In February 2001, the UK Government instigated another Emergency Planning Review (Cabinet Office 2001) and transferred responsibility for overseeing emergency management to the new Civil Contingencies Unit in the Cabinet Office (O'Brien & Read 2005). This was prior to the 9/11 terrorist attacks in the US although those events soon overshadowed UK domestic threats. The Review reported in October 2001 and contrary to previous reviews called for a hierarchical national, regional and local approach to "... do everything that can be done to enhance our resilience" (Walker & Broderick 2006: 46).

To the practitioner 'resilience' is a convenient collective neologism, but it is a very old idea given new life (Alexander 2013). A "veritable cottage industry on resilience" (Kahan 2015:1) has arisen that is global in its adoption and resilience has been used as an "interdisciplinary boundary object" in both crisis research and politics (Welsh 2014:15). In the UK, the concept was initially able to link the divergent strands of civil emergencies, civil defence, counter-terrorism and especially the growing focus on risk and business continuity management under a unifying policy agenda and do so with relatively little reorganisation and cost to government. The latter is an important advantage because adoption of the resilience doctrine enabled government to gradually shift the state's responsibility for the protection of its citizens to self-help by citizens and corporations (Anderson 2015), by "harnessing local resources and expertise to help themselves in an emergency, in a way that complements the response of the emergency services" (Cabinet Office 2011b: 4), only possible with greater access to information about hazards, risks and threats. A council official noted that the change in title from emergency planning officer to resilience manager seemed to "enhance the term's visibility and embed the term within the council's decision making" (Shaw & Maythorne 2011: 49). The ad hoc arrangements that had evolved post-Cold War to fill a need with their language of 'association', 'society', 'groups', 'panels' and 'liaison' (Norman & Coles 2003) were replaced by Local Resilience Forum, Resilience Team and, to convey action and order, simply '*Resilience*' as in London Resilience and RESILIENCE-UK (Rogers 2013).

 Internationally the term resilience was defined for disaster risk reduction purposes as "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and function" (UNISDR 2009:24). This is not dissimilar to the definition promulgated by the Cabinet Office of the "ability of the community, services, area or infrastructure to detect, prevent, and, if necessary to withstand, handle and recover from disruptive challenges" (Cabinet Office 2013d). However, the devil is in the detail.

To the UN definition was added the important caveat, that "The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organizing itself both prior to and during times of need" (UNISDR 2009:24) and it is this link between the policy and

the resourcing of that policy, or failure to do so, that raises doubt about the usefulness of resilience for future catastrophic crises (see Chapter IV).

The Coalition government 2010-15 published its policy on emergency planning online in two separate documents, and both were re-affirmed on 8 May 2015 by the new Conservative government. The policy on *Emergency Planning* opens with "It's important that local communities can be resilient in the event of major emergencies" and then rather briefly focuses on the local authority role as though it were only a holding policy. Reflecting the difference between aim and delivery in the longer more detailed policy on *Emergency Response Planning* the government claims "We work to ensure society is better prepared for, and able to recover from, emergencies … working with organisations and individuals from across the UK" in an inclusive way coupled with a pro-active information strategy, utilising the opportunities presented by technology (Cabinet Office 2013b; 2015b).

In the USA, a definition of resilience as *"the ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies"* was offered by President Obama (US DHS 2011) and resilience features in the Quadrennial Homeland Security Reviews (US DHS 2010 & 2014). Homeland Security policy analyst Kahan (2015) has found that despite the above guidance there exists "a spectrum of definitions" and that "innumerable variations of definitions abound, depending upon the needs and perspectives of the definer" (p2). In his conclusion Kahan draws our attention to the danger of relying on this new policy of resilience. Firstly, the complexity and ubiquitous nature of its application defies performance measurement, a major concern for any government. More importantly, he expresses concern that whilst the American implementation of resilience policies at all levels will inevitably lead to increased preparedness and resilience, that implementation is so complex and such a challenge to governance that improvement may fail. In other words, the same argument about resourcing and organising that was raised by the UN caveat above. Concluding on a humorous note he notes that resilience will "remain resilient for a long time, although not competing with the cockroach" (p11).

Resilience has other critics. The concept of community resilience is challenged by Rogers (2013) using the 2011 August riots in the UK as an example. He describes three types of resilience in UK policy, that is organisational, technological, and community, highlighting the negative aspects of the community's reliance on "state-centric expert

knowledge" and "technological fixes that govern at a distance" of the first two types. The paradox of community resilience is that "it excludes citizens from decision making but seeks to render them more responsible for their own safety" (p322).

In the wider context of disaster risk and climate change adaptation, influenced by her interdisciplinary research in Nepal 2008-11 on communities affected by landslides Sudmeier-Rieux (2014) reminds us that those literally '*living on the edge'*, displaced by more affluent groups, and characterised by poverty and food shortages are often quite resilient because they have adapted to the conditions, are familiar with the dangers, and although they are the first to suffer an event they are the first to recover or "bounce-back*"* (p68). Summing up the literature on resilience and development she points to the contradiction that resilient communities may still be vulnerable and at risk as well as corrupt and inequitable (Levine et al 2012) and resilience as a policy can be a 'Band-Aid' that ignores the "dangerous living conditions and high vulnerability that created risk as well as resilience in the first place" (Sudmeier-Rieux 2014: 69). In a similar vein Grint (2009) raises the question of resilience inhibiting necessary changes "... what if we become so resilient that we withstand forces that ought to lead to change and ought not to be resisted" (p1).

4.3. Resilience and public information

Several unsynchronised and diverse drivers at the cusp of the new Millennium meant that any attempts by the authorities to control either the access to information or the flow of information became unsustainable. The *Need-to-Know* paradigm of secrecy was gradually replaced by a new crisis paradigm where ideas and initiatives mushroomed and spread as websites and the internet replaced traditional ministerial letters, confidential memoranda, circulars to chief executives and Green/White Papers, so that now politicians, policy analysts, journalists, academics and interested citizens all had opportunities to review and debate the material. Because it happened over a period of years one cannot put a date on this sea-change nor assign any events to mark it. However, there is no doubt that the 9/11 terrorist attacks on the World Trade Centre and the Pentagon were a global paradigm shift in keeping with Kuhn (1962) even though other countries, including the UK, had previously suffered similar levels of casualties, for instance the 'Troubles' in Northern Ireland (McKittrick & McVea 2001). The newly created Cabinet Office Civil Contingencies Secretariat was without a website and initially

had to direct the public to the website of the Australian Emergency Management Agency for advice.

A combination of technology miniaturisation which replaced shoulder mounted video tape cameras with handheld digital cameras linked to satellite telephones, globalisation of the media, competition for audiences and the birth of citizen journalism (Bowman & Willis 2003) not forgetting the need for governments to justify expenditure to taxpayers, meant that for the first time in history ordinary people could watch events unfold in real time. The terrorist attacks on the Twin Towers in New York in 2001 were seen in their full horror in real time by a global audience alongside subsequent cruise missile targets in Afghanistan in 2001 and Iraqi in 2003.

 The Asian Tsunami of 26 December 2004 was filmed by tourists, often using mobile phones, as were scenes from the explosions in the London Underground in July 2005. Not only could the media entertain and be used for real time public safety information, it could also expose failings by the authorities. For instance, during the London Bombings 2005 the media were "aware of the explosions on the Underground within minutes of them taking place" (London Assembly 2006: para 6.18) well before the police issued advice to the public. Later that year the world saw the ineptitude of the US handling of the impact of Hurricane Katrina as very quickly the media had teams on the ground in New Orleans. For instance, SkyNews/ITV presented their programmes from the flooded city immediately the storm had passed, a broadcasting technique which is used routinely now for every major event and puts early pressure on the crisis leadership. The March 2011 Japanese earthquake and tsunami were also played out in real time continuously throughout the day by all the international news channels, in contrast for instance to the secrecy that had surrounded the 1986 Chernobyl, Ukraine nuclear accident (Harman-Stokes 1995; Porfiriev 1998).

The resilient citizen

The involvement of the public in counter-terrorism evolved in the UK in response to the private sector's desire to play a part, as discussed in a booklet *The Unlikely Counter-Terrorists* (Briggs 2002).   In the context of surveillance Vaughan-Williams (2008) revisited the concept of the citizen-detective, quoting Benjamin (1938/2003: 21) that "In times of terror, when everyone is something of a conspirator, everybody will be in the position of having to play detective" and then the 2006 public information pamphlet of

the EC that "The battle against terrorism requires the mobilisation of all citizens to guarantee freedom and security for all" (p70). The citizen-detective concept is more sympathetic to the revolutionary history of continental Europe than the UK but has been taken further by Malcolm (2013) in a more convincing argument in which he introduces the *resilient citizen*.

Some counter terrorism initiatives now run joint police-public-business events with the aim of improving resilience e.g. Project Kraken for maritime leisure and business, Project Pegasus for aviation, and Project Argus for general business and crowded areas such as shopping centres with many civilians given additional training and security information (NCTSO 2014). Malcolm (2013) has taken the citizen-detective concept forward to the *resilient citizen*, the latter "… considered a more privileged" (p318) citizen because of the up-to-date unclassified threat information, planning checklists and CPD certificates that those in Project Argus etc. receive. He summarises the resilient citizen as "capturing a bargain that is struck between state and citizen – greater knowledge for greater responsibility" (p319). Witnessing an Argus training seminar, he observed how the resilient citizen can feedback knowledge about their specific areas to the authorities. The importance of this is that the local citizen can distinguish risks, for instance spotting unusual transport movements or distinguishing between the activities of devout Muslims and those that could be radicalised, and thereby influence the authorities towards a more sensitive and accurate response. This is an organised example of the spontaneous pro-social behaviour observed in natural disasters (Dynes & Quarantelli 1977; Rodriguez, Trainor & Quarantelli 2006; Voorhees 2008).

5. CONCLUSION

I began this chapter by outlining Thomas Kuhn's (1962) paradigm theory and discussing how I would use this as inspiration for my research into the crisis phenomenon. This was more gestalt in the manner of Ritzer (1979) than in Kuhn's original natural science context. I went on to construct two paradigms in UK crisis practice, beginning with the post-World War II first and last use of nuclear weapons, a period marked by a paternalistic and secretive state protected by the *Need-to-Know?* culture. This was succeeded by a paradigm where almost unlimited information became available to all and responsibility was transferred from the state to the individual or at least their socio-economic groups with the "pervasive idiom" (Walker & Cooper 2011:144) of the *Resilience* doctrine. The two paradigms were separated by an untidy and ill-defined

hiatus rather than a boundary and as far as practice goes resilience, as a concept or rather as a doctrine, continues to be promoted. One of the two policy strands of the 2015-17 Conservative government, largely unchanged from the Coalition government of 2010-15, seeks to achieve a resilient society by "providing opportunities to share news, ideas and good practice, publications and practical guides" (Cabinet Office 2013b; 2015b).

CHAPTER IV: TOWARDS THE *NOVEL CRISIS* PARADIGM

1. INTRODUCTION

In the last chapter I argued that two distinct crisis paradigms (Khun 1962; Ritzer 1979) can be discerned since World War II, the *Need-to-Know?* paradigm of paternalistic secrecy that reflected the Cold War period and the still dominant *Resilience* paradigm which replaced it with its almost unlimited access to information and promulgation of data on hazards, risks, and threats and the steps to be taken. In this chapter I will explore the indications that we are looking towards a new crisis paradigm, as yet ill-defined as in Lagadec's "terra incognita" (2009: 474), which I label the *Novel Crisis* paradigm after Howitt (2012) and Mueller (2013) in a context of accelerating environmental change (Endter-Wada & Ingram 2012) and other mega-trends (Blackburn & Marques 2013; Halal & Marien 2011). This is not to forget the continuing proliferation of nuclear weapons (Delpech 2012) which has continued despite the end of the Cold War.

Nuclear weapons, as Nitze (1956) noted, affected all conflicts. He used the analogy of chess where although the queens, representing the then NATO and Soviet nuclear arsenals, might never be used their positions have "a decisive bearing on which side can safely advance a limited-war bishop or even a cold-war pawn" (p195) in the context of international development, complex humanitarian emergencies, and political coups. Indeed, as nuclear proliferation progressed Kahn (1966) even gave some thought to the ethical principles that might govern a retaliatory strike. In a recent analysis of the continuing efficacy of nuclear deterrence Delpech (2012) used the term "strategic piracy" (p162) to describe the failure of a "small number of obnoxious states" to follow international protocols not unlike the bishops and pawns of Nitze (1956). Now there are nine nuclear powers and others that aspire to such weapons including non-state actors that may not be deterred by sanctions or retaliation (Delpech 2012).

In keeping with crisis and disaster research we cannot set up experiments to explore ways of for instance managing a nuclear attack or even mitigating the detonation of a small improvised device although crude estimates of casualties are possible (Dallas & Bell 2007). Looking back Ghamari-Tabrizi (2000) observed that nuclear war was an unknown quantity that relied on simulations for planning which replaced the knowledge of military officers drawn from combat experience with "civilian virtuosi of the

techniques of Monte Carlo, systems analysis … and other innovations in simulating combat operations" (p164). An over-simplification perhaps because as Delpech (2012) notes in the crisis that might precede the strike reading the opponents intent and resolve would rely on human skills. However, the idea that a new paradigm required different expertise is one that may apply to a future paradigm.

In 1962 Kahn wrote about the challenge of planning for the unthinkable, an adjective as relevant now to planning for environmental change as it was then to the threat of thermonuclear war. The latter "are not only unpleasant events they are, fortunately, unexperienced [my emphasis] events, and the crises which threaten such wars are almost equally unexperienced." (Kahn 1962:143 in Aradau & van Munster 2011:74). He went on to say that "few are able to force themselves to persist in looking for novel possibilities in this area without aids to their imagination". As an aid to the imagination we now have extensive data and even video footage of what we can expect from future environmental impacts based on events such as the Asian Tsunami 2004, New Orleans 2005, the Great East Japan Earthquake 2011, and Hurricane Sandy 2012.

2. A NEW CONTEXT: GLOBAL ENVIRONMENTAL CHANGE

Whilst the nuclear threat still looms over us, be it the proliferation of nuclear weapon technology (Delpech 2012) or accidents such as Chernobyl 1986 (Malone 1987) and Fukushima 2011 (Hindmarsh 2013), there is an equally pressing existential issue, the environment.

Human influence in shaping, or rather degrading, the natural environment was recognised by the UN Conference on the Human Environment, Stockholm 1972, for which the bio-chemist Hans Palmstierna prepared a short landmark briefing paper, *The Future Imperative for the Human Environment* (1972), in which he warned that conventional crises are temporary and can be managed whereas the environmental crisis was more a historical landmark from which there was no going back. This is a view that has been reiterated by Paglia (2015) who agreed with Palmstierna that environmental change was "not a proper crisis" although he conceded that the "concept of crisis is ambiguous and applied differently in various social and scholarly contexts" (p249). His reasoning was that anthropocentric environmental impacts are not amenable to short-term management nor do they revert to the pre-crisis state. They are more in keeping with an "historical period" (p250).

The possibility of irreversible environmental change through human influence challenges the policy of resilience. It was illustrated by the Great Acceleration graphs produced by the International Geosphere-Biosphere Programme (Steffen et al 2007) showing socio-economic activity and the impact on the natural world. The programme also spawned the *Anthropocene* concept (Crutzen & Stoermer 2000; Zalasiewicz et al. 2011), where man's impact has been on a geological scale. As a sign of how little was achieved in the 40 years since Palmstierna (1972), the biologists Anne and Paul Ehrlich gave this perspective to the Royal Society in 2012 "... for the first time, humanity's global civilisation – the worldwide, increasingly interconnected, highly technological society in which we all are to one degree or another, embedded – is threatened with collapse by an array of environmental problems". After listing the many environmental threats that range from ocean acidification to over exploitation of ground water the Ehrlichs concede that "these are not separate problems but interact in two gigantic complex adaptive systems: the biosphere system and the human socio-economic system" (Ehrlich & Ehrlich 2013:1). Three decades earlier Beck had pointed out that **"**Environmental problems are not problems of our surroundings, but – in their origins and through their consequences – are thoroughly social problems, problems of people, their history, their living conditions, their relation to the world and reality" (Beck 1992:81).

Shortly after the 1972 UN Conference on the Human Environment the landmark paper by Molina & Rowland (1974) on the destruction of the ozone layer that arguably started the climate change debate was published tying in with the general awakening of interest in the environment discussed earlier in this chapter. Ecological theories of resilience (Holling 1973) from which the current ubiquitous resilience doctrine is derived and the ecological concept of *surprise*, defined as "a condition in which perceived reality departs qualitatively from expectations" (Holling 1986 cited by Longstaff 2009), were inappropriately adopted perhaps to give the new doctrine greater weight.

The increasing importance of global environmental drivers has persuaded some authors to apply the conceptual models more literally (Baker & Refsgaard 2007; Gunderson 2010) to explain socio-eco issues and address future crises such as concatenating crises (Biggs et al. 2011). The latter draws attention to the ways in which increasingly global shocks or crises such as natural disasters, because of globalisation and connectivity,

have the potential to "spread, synchronise, and interact in novel ways" (p1) although those same features may be the tools of our salvation if we can reverse their direction.

Yet another ecological concept, that of Panarchy, described by Gunderson & Holling (2002:21) as "an antithesis to the word hierarchy (literally, sacred rules) …. a framework of nature's rules," was invoked initially as a metaphor for the complex man and nature interaction.   However, influenced by the impact of 9/11 (Holling 2004) the original theoretical model has since been used to conceptualise a new threshold in human affairs (Briske et al 2010) and has been applied to cultures and business (Allen et al. 2014). As the latter explain "Panarchy is different from typically envisioned hierarchies in that control is not just exerted by larger-scale, top-down processes, but can also come from small scale or bottom-up processes" (p1) which if applied metaphorically to crisis is relevant to the emergent crisis leadership discussion in following chapters.

There is now little doubt that, whatever the cause, global systems are already in crisis and faced with difficult decisions, the risks and impacts summarised in the UN IPCC *Summary for Policy Makers* (2012) as

> "substantial warming in temperature extremes by the end of the 21st century. It is virtually certain that increases in the frequency and magnitude of warm daily temperature extremes and decreases in cold extremes will occur in the 21st century at the global scale …" (p12).

As a result, they warn of more frequent heavy precipitation, increase in maximum tropical cyclone wind speed, sea level rise with extreme coastal high-water levels and adverse impacts such as coastal erosion and inundation, heat waves, glacial retreat, and/or permafrost degradation.   This is reiterated in the subsequent UN IPCC *Fifth Assessment Synthesis Report* (2014) as

> "Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development. Increasing magnitudes of warming increase the likelihood of severe, pervasive, and irreversible impacts for people, species and ecosystems. Continued high emissions would lead to mostly negative impacts for biodiversity, ecosystem services, and economic development and amplify risks for livelihoods and for food and human security" (p64).

Global Environmental Change and the potential for crises

Along with environmental change, the growing global population and urbanisation are tangible precursors of crisis.   In 2010 the United Nations reported that a milestone had been reached whereby it was estimated that half the world's population was now living in urban areas, mostly in coastal towns with populations of 500,000 but growing (UN HABITAT 2010).   Already there are 23 urban areas worldwide that are described as megacities, that is, their population exceeds 10 million although many of them top 20 million. Of these megacities 16 are within the coastal zone, the area of land that is no more than 100 km from high-water with an elevation of less than 50m.

The picture is complicated by a number of rapidly expanding cites that are just short of being megacities whilst huge coastal metacities have arisen through agglomeration (UN HABITAT 2006), such as Hong Kong-Shenzhen-Guangzhou in China, estimated population of 120 million, the Tokyo-Nagoya-Osaka-Kyoto-Kobe region with an estimated population of 60 million, and the West African coastal corridor stretching from Lagos to Accra through four countries (UN HABITAT 2010).   If the conceptual distance from the sea is extended to 200km many other riparian cities and regions share the risks (Nicholls 1995) along with the economic benefits (Blackburn & Marques 2013). This ribbon of land is populated by 3.2 billion people of whom more than one billion are settled in slums or informal suburbs (UN HABITAT 2006). Such unplanned settlements are vulnerable, lacking a stable community structure and state services such as health and policing. Along with crime, major disorder can erupt such as that in the slums of Nairobi in 2008 in which 1200 people died and 300,000 were displaced (Parsons 2010).

Early crises from the impacts of global environmental change and other *global shocks* (OECD 2011) are likely to be experienced by communities in the coastal margin (McGranahan, Balk & Anderson 2007; Glavovic 2015) such as Bangladesh (Blitz 2014) and in Small Island Developing States (Kelman 2006; Simon 2007; Boto & Biasca 2012; Wright 2013).   In a situation, similar to Nitze's (1956) analogy of conflict under the umbrella of a nuclear hegemony, a climate "Leviathan" (Wainwright & Mann 2014:314) will be needed for global climate adaptation. Beneath the "off-the-scale" (Topper & Lagadec 2013: 6) context of global environmental change, practitioners will face multiple "fractal" crises (p10) or crises within a crisis, albeit perhaps mega by conventional standards and "unexperienced" (Kahn 1962: 143).   Using imagination, I liken the coast to a defensive border with *crenellations* where the geomorphological

features of cliffs, marshes, estuaries etc. augmented by coastal defences create metaphorical strong and weak points, the "hotspots" of Newton, Carruthers & Icely (2011:1). Within these crenellations, and the mesocosms they create, natural hazards interact with poor governance, corruption, and poverty (Transparency International 2011), starting with minor "nuisance" events before an irreversible "tipping point" is reached (Sweet & Park 2014:19). This vulnerability is increased by the population "footprint" of megacities, that is the need to import food, water, and energy, often from across the globe (Swaney et al 2012: 22), taken together making the "wicked challenges" of Moser et al. (2012).

3. CHALLENGES TO THE RESILIENCE PARADIGM

The resilience paradigm is based on an institutional approach that at its best has developed to meet hazards and threats "through knowledge, emerging tools, consensual social collaboration, and preparations to be flexibly innovative" (Comfort et al. 2010: 273) but as we saw in chapter II resilience is only as effective as the available resources and organisation (UNISDR 2009). The policy is under pressure on a number of sides, including the sheer scale of some crises, and their novelty, which environmental change can be expected to exacerbate. To these we can add the impact of geopolitics, migration, population, organised crime, corruption, and global inter-connectedness which can be expected to present new challenges and opportunities.

Scale

Scale challenges the resilience paradigm and hitherto has been tackled by increasing and developing capabilities (Smet, Lagadec & Leysen 2012). However, some recent crises have had a spatial impact that transcends jurisdictions, even of the European Community, the *landscape crises* of Leonard & Howitt (2012) and transboundary crises of Herman & Dayton (2009) and Ansell et al. (2010), which has led to the generous use of the *mega* prefix to describe such phenomena. It was used by Naisbit in 1982 in his *'Megatrends'* which outlined his ten long-term global drivers that would move us from a post-industrial world to an information society. These and other new trends were revisited and expanded in *Megachange* by Franklin & Andrews (2012). The *megacity* concept was perhaps the earliest and most common use of the prefix, often linked to vulnerability and other problems (Institute of Civil Engineers 1995; Nicholls 1995; World Bank 2010; Pellin & Blackmore 2013; Suri & Taube 2014) and in the same context *mega-*

slums (Black & Sutila 1994), *mega-construction projects* (Barthel 2010) and now *meta-cities* (McGrath & Pickett 2011) were added. The *mega* prefix has been used by a number of scholars in relation to crises and disasters (Garrett et al. 2007, Rosenthal 2009; Halal & Marien 2011); "environmental *mega-crisis*" (Endter-Wada & Ingram 2012); financial "*mega-catastrophe*" (Rust & Killinger 2008); *mega messes* (Alpaslan & Mitroff 2011); and the potential for a mega disaster in the Dutch Delta (Engel et al. 2012).

The mega-crisis concept was explored for a compilation of topics including public health, finance, food security, 'fragile' states, and so on by 41 contributors, many of whom were leaders in their respective sub-disciplines (Helsloot et al. 2013). To quote the editors "Mega-crises are not just more of the same; they present a new class of adversity with many 'unknowns'. They defy boundaries, limits, neat demarcations, patterned connections and linear consequences … Mega-crises imply not only quantum but also quality jumps in coping with the defining features of crisis …" (p5).

Scale is also represented by the qualitative ill-defined term *catastrophe,* used interchangeably much like crisis and disaster. The key differences between catastrophes and major disasters are that the infrastructure is severely damaged or destroyed, including emergency responders, and local officials, medical staff and emergency personnel are affected, which makes recovery difficult. The communities and the economy are severely disrupted, perhaps beyond restoration, and the wide-area affected means that help may not be forthcoming. Despite the above, pro-social behavior and self-rescue is found whilst anti-social behavior such as looting is as rare as it is in disasters (Quarantelli 2000, 2006).

Novelty

The second property which is much more difficult to identify and describe is novelty. The novel crisis may arise through scale and complexity, risks that are "unknown unknowns" (Rumsfeld 2002: 11), or unprecedented and therefore unprepared for. It is a concept recognised by a relatively small group of crisis scholars including Lagadec (2009), Leonard & Howitt (2006; 2012), Boin (2012), and Mueller (2013). In some early thoughts on novelty Boin noted that "'The modern crisis does not confine itself to a particular policy area (say health or energy); it jumps from one field to the other, unearthing issues and recombining them into unforeseen mega-threats" (2004: 166).

Scale is easy to describe using well established concepts and techniques and therefore easy to recognise whereas novelty is almost by definition difficult to identify since we have little reference for it or the knowledge that would be useful is diffused or held by other disciplines. To some extent all crises have an element of novelty but key elements are familiar which enables a shared situational awareness of the crisis to be developed and responses generated even if plans have to be customised or adapted. In a *novel crisis,* there may be an initial search for a customisable plan but it may have to be improvised although without a shared situational awareness this will not be easy. Whereas a conventional crisis is likely to be managed according to hierarchical structures of authority with a response to match the situation facing us, the novel crisis presents issues of who is responsible, who recognises it, and who has the necessary specialist knowledge (Stern 2013). Scale and novelty may force us to base the response on what capabilities exist or can be improvised in a hitherto untried response rather than what the situation is or merits (Leonard & Howitt 2012).

The metaphor of the Swiss cheese slices, used as a teaching aid for crisis education (Smith 2006), can be used to help in understanding the development of a novel crisis. The randomness of the holes in imaginary slices from a block of cheese does not allow the transit of something representing a threat or hazard and therefore "does not normally cause a bad outcome." But if in unusual circumstances the holes in many slices, representing boundaries or safeguards, momentarily line up to permit a trajectory" (Reason 2000:769) this can lead to a crisis such as envisaged by Boin (2004) above.

Global inter-connectivity

Setting aside the environment, the post 9/11 project *Making the Nation Safer* by the National Research Council (2002) drew attention to the vulnerability of the infrastructure (transport, communications, food, water, power) in the US, most of it privately owned, a situation mirrored across the developed world. As if to underline the risks in 2003 widespread blackouts due to minor local events occurred across the North East United States & Canada and across South Eastern Europe. Other blackouts have followed. Byrd & Matthewman (2014) reviewed blackouts and their consequences, whilst Helbing (2013) has coined the term *hyper-risk* to describe the risk posed by the global systems of "networks formed from inter-dependent networks" (Gao et al. 2012:

40). The preface to an output from the above National Research Council project summed up the position:

> "Economic systems, like ecological systems, tend to become less resilient…as they become more efficient, so our infrastructures are vulnerable to local disruptions, which could lead to widespread or catastrophic failures.   In addition, the high level of inter-connectedness of these systems means that the abuse, destruction, or interruption of any one of them quickly affects the others. As a result, the whole society is vulnerable, with the welfare and even lives of significant portions of the population placed at risk" (p25)

The relationship between privately owned infrastructure, now vital for human survival, and crisis was taken up by the OECD which in 2011 inaugurated a forward-thinking programme of multidisciplinary 'invitation-only' workshops and an annual High Level Risk Forum on strategic crisis management accompanied by published guidance (Baubion 2013).   Concepts of resilience and conventional crisis still prevail in the discussions but 'landscape crises' and 'novelty' were introduced with other forward-thinking ideas, e.g. Sundelius (2013), Mueller (2013), and pre-eminently Leonard & Howitt (2012).

The crisis themes of novelty and scale, especially for the private sector are also addressed by the World Economic Forum (WEF), an independent Swiss not-for-profit foundation based in Geneva which describes itself as the *International Organisation for Public-Private Cooperation.* Apart from hosting an annual high-level meeting in Davos it publishes an annual Global Risks Report (World Economic Forum 2016), the core theme in 2016 being the "resilience imperative" (p8). However, although not subject to the same rigorous peer review as for instance IPCC reports, the number and breadth of contributors to the annual "perception of risks" makes them worthy of consideration. The immediate risks are fairly predictable with the three most likely being large-scale involuntary migration, extreme weather events and failure of climate-change mitigation and adaptation. Projecting forward for the next ten years the perceived risks in order are "water crises, failure of climate change mitigation and adaptation, extreme weather events, food crises and profound social instability" (p13). The latter has complex origins but is representative of what the WEF terms the Fourth Industrial Revolution, that is, the as yet little understood impact of digitalisation and connectivity.

Geopolitical and Security Implications

The geopolitical implications of environmental change, in particular the scenario of 'abrupt climate change' such as might result from the oceans' sudden thermohaline circulation collapse, were explored in detail by the US Committee on Abrupt Climate Change (2002) without attracting controversy. That could not be said for the report commissioned by the Pentagon (Schwartz & Randall 2003) on two counts. The report challenged the 'in denial' stance of the Bush administration towards climate change and recommended that "the risk of abrupt climate change, although uncertain and quite possibly small, should be elevated beyond a scientific debate to a US national security concern" (p3).   To date, their predictions, for instance that severe drought and cold in Scandinavia would lead to southerly migration in Europe, have failed to materialise, although their concluding observation that "Europe will be struggling internally, large numbers of refugees washing up on its shores" (p22) has, but for a different reason. The issue of climate and national security was subsequently raised by the Council of Europe (EC 2008) and has since become a theme in the literature (Raleigh & Urdal 2007; Barnett & Adger 2007; Abbott 2008; National Research Council 2013) with a recent meta-study by Burke et al. (2015) which focussed on one aspect of future crises, that is conflict.   They concluded that although there was not a single simple causal link between climate and conflict, research indicated "that adverse climatic events increase the risk of violence and conflict, at both the interpersonal level and the intergroup level, in societies around the world and throughout history" (p610).

The potential for displacement and migration caused by environmental change is considerable (Adamo 2010) and includes the negative impacts described earlier as well as secondary impacts on availability of potable water, decreasing crop yields, and public health (UN 2009; Foresight 2011).   The background estimate of the number of people forcibly displaced worldwide at the end of 2014 was 59.5 million, of which 51% were under the age of 18, and 80% were 'hosted' by developing countries (UNHCR 2015). The civil war in Syria has continued to add to this, straining the policy of an external border for the EU with internal freedom of movement (EU FRONTEX 2017).

Whilst there is uncertainty about the magnitude and timing, the movement of populations and the numbers of displaced persons as a result of environmental pressures is expected to rise with estimates ranging widely, potentially 700 million but with a considered estimate of 50 million by 2050 based on mapping of features and

population (Warner et al 2009) and 150-200 million by the Stern Review (2006). Current UN definitions of refugees, asylum seekers, and migrants are not adequate for those displaced by climate and so consideration is being given to how they might be protected (Kälin & Schrepfer 2012).

An extremely pessimistic but perhaps realistic view has been taken by Davis (2010) which predates but also mirrors the WEF perceived risks of the failure of climate change adaptation and resulting mass migration,

> ".... worldwide adaptation to climate change, which presupposes trillions of dollars of investment in the urban and rural infrastructure of poor and medium income countries, as well as the assisted migration of tens of millions of people from Africa and Asia, would necessarily command a revolution of almost mythic magnitude in the redistribution of income and power" (Davis 2010:5 cited in Wainwright & Mann 2014:314).

There is a danger when discussing the future that information may be partial and analysis missing. However, the conflation of security issues that must now include migration, a complex humanitarian emergency, international terrorism, war and nation building is being played out before us at the time of writing. The origins of the current migration crisis in Europe are too complex to do justice to them here but it demonstrates the characteristics of a complex, transboundary, landscape, and mega crisis which led the European Commission to move funding from the international budget to internal emergency humanitarian aid for the first time (EC 2016).

The ineffectiveness and corruption of international aid has been exposed by investigative journalism, e.g. Klein (2007), Polman (2011), perhaps triggering the political concern that led to a shift in UK policy from response towards preventative measures (Jones 2014). In a provocatively titled book, *Humanitarian Business*, Weiss (2013) claims that the metaphor of a humanitarian marketplace is the appropriate lens through which to examine the way neoliberalism is impacting on humanitarian aid across a range of organisations from the International Federation of the Red Cross and Red Crescent, big budget NGOs, not-for-profit companies, and the PMCs. All can be agents or even substitutes for state organisations in the delivery of aid in both disasters and complex emergencies but the use of corporate military resources for security in the latter, as well as the increasing substitution for state armies and police is highly

contentious (Liu 2010). This is especially so when their employment involves direct participation (Melzer 2009), examples being security in New Orleans in 2005 (Tierney & Bevc 2007), in Nigeria against Boko Haram (Freeman 2015), and the counter-piracy patrols in international waters by private maritime security companies and their floating armouries (Remote Control Project 2014), sometimes sanctioned by the International Maritime Organisation (IMO 2012). Although the above developments are a logical extension of the global privatisation of energy, water, sanitation, prisons, store detectives and so on, it is something of a step change, challenging the humanitarian principles of sovereignty and subsidiarity in the UN General Assembly resolution 46/182 (UN OCHA 2012).

4. CONCLUSION

In Chapter III I began by describing how I had used Thomas Kuhn's (1962) paradigm theory and its subsequent application to the social sciences by Ritzer (1979) as inspiration for my research, perhaps taking dramatic licence to convey the point. I proposed two paradigms in UK crisis practice, the secretive *Need-to-Know?* paradigm and the *Resilience* paradigm that replaced it, but diverging from the theoretical notion of paradigmatic shift I accepted that these two paradigms were not separated by a clear boundary but by an ill-defined hiatus because of the multi-disciplinary strands of research, policy and investment. I concluded that chapter with the UK concepts of community resilience, now a re-invigorated government policy (Cabinet Office 2016), and the resilient citizen (Malcolm 2013).

I have drawn attention to the challenge to the Resilient paradigm that global environmental change presents, where "a range of slow-onset events or trends" reinforces the "increasing frequency and severity of extreme events" (Simon 2007: 77). This is in addition to the potential impacts of natural hazards such as earthquakes, volcanic eruptions, and pandemics, notwithstanding that the proliferation of nuclear weapons has increased since the Cold War and therefore remains an existential threat. The gestation and course of conventional crises are of relatively short duration for which the institutional cycle of anticipation followed by preparation, response, recovery, and prevention, the disaster cycle of Alexander (2002a) and known in the UK as Integrated Emergency Management (Home Office 1992; HM Government 2013: 8) still serves. Whilst we can prepare for the challenges ahead, response may be inadequate, recovery irrelevant, and prevention superseded by adaptation at best.

As with the displacement of the *Need-to-Know?* paradigm by the *Resilience* paradigm the shift to a new paradigm that reflects the above challenges of scale and novelty, existential threats and interconnectedness, which I have labelled the *Novel Crisis* paradigm, will be resisted metaphorically by stretching the concept of resilience, probably until circumstances clearly demonstrate that it is no longer adequate. In answer to the global "anaemic policy response" to the likely impact of climate change the European Commission pointed out that it was only one of many issues of inequality facing nations and will create new vulnerabilities depending on countries' "relative economic and political power within the international system" (EC 2008b: 15).

CHAPTER V: CRISIS MANAGEMENT AND LEADERSHIP

1. INTRODUCTION

The previous chapter considered how the future natural and socio-economic worlds might collide leading to unforeseen and perhaps unknowable novel crises. These might include geopolitical and security challenges as well as catastrophes where our response systems are incapacitated by the scale of the event. The dilemma is whether to work against the instability and challenges by developing ever more sophisticated command and control systems, requiring "extraordinary skills on the part of the leaders", or to "work with the instability" (Grint 2002: 250) by encouraging and facilitating new forms of crisis leadership.

In the contemporary *Resilience* paradigm crisis leaders and managers are increasingly "…confronted by a maze of various dimensions of scientific, technical, organisational, economic, diplomatic, cultural and ethical issues" (Lagadec & Michel-Kerjan 2006: 464). The privatisation and globalisation of vital services including potable water and food distribution, and the critical infrastructure, impacts on how crises are dealt with given that "the business world is spread over several locations … with very different actors and frameworks of decision making in each" (p464). Governments may be operating in partnership or in parallel with the private sector and NGOs whilst the whole event is monitored by a diverse community of stakeholders through the media and the real-time social media (Gowing 2010).

For some crises, the response is the surge of people and resources either from the responding organisations or from within the community to the scene of the event be it a major incident or disaster. In other crises, it may be without a locus and manifested in one, or all, of: the heightened awareness of leaders and systems, perhaps provoked by the media or scientific advice; the release of strategic resources; and the transition of power or responsibility.

In this chapter I will begin with the organisational response to crisis because it is within systems and organisations that management and leadership are usually embedded and that what is meant by leadership can vary with organisation (Osborn et al 2002). I consider two theoretical typologies of crisis response organisations, the classic Disaster Research Centre (DRC) typology (Dynes 1970; 1990) and those operating in the more

contemporary *extreme contexts* of Hannah et al. (2009). I then outline and contrast the systems in use in the US and the UK, elements of which are widely used by other jurisdictions. I follow this by trying to distil crisis leadership from crisis management, the latter term used quite loosely by practitioners with leadership implicit because of the circumstances in which it is invoked, before discussing some of the qualities and characteristics of crisis leadership. I have opted for the collective *crisis leadership,* rather than crisis leaders, because in our digital social environment even individual leaders, the "*heroes* – great men and occasionally women who rise to the fore in times of crisis" (Senge 2002:22) are dependent on others in their networks although the relationships may be a spontaneous and a "fortuitous alignment of functions" (Leithwood et al. 2006: 63).

2. ORGANISATIONAL RESPONSE TO CRISIS

2.1. Typologies of the organisational response to crisis

Summarising the early collective work of the Disaster Research Centre (DRC) at the University of Delaware, Dynes (1970) published a typology of responding organisations based on whether the tasks they undertook were regular or non-regular against whether the organisational structure predated the event or was new, resulting in four types (Table 1).

Table 1: DRC typology of organisational response (from Dynes 1970)		Tasks	
		<u>Regular</u>	<u>Non-regular</u>
Organisational structures	<u>Old</u>	Type I: *ESTABLISHED*	Type III: *EXTENDING*
	<u>New</u>	Type II: *EXPANDING*	Type IV: *EMERGENT*

Type I *established* organisations match conventional structures to regular responses whereas Type II *expanding* organisations respond by adding resources to their structure. Type III *extending* organisations meet new challenges with their original structures but Type IV *emergent* organisations respond to new non-regular crises with new structures.

The original typology proved influential in stimulating many researchers to explore the response by organisations, reviewed by Britton (1988). Indeed, Brouillette and Quarantelli (1971) found that in a crisis, all four types could co-exist within a bureaucracy that would be thought of as Type I established organisation, whilst Dynes and Aquirre (1976) preferred to describe organisations as groups to reflect the often-looser arrangements this implied (Table 2).

Table 2: Examples of tasks (after Dynes & Aquirre 1976: 12)

Type I	Established group	Police cordon at the scene of an incident or a quarantine imposed by public health officials.
Type II	Expanding group	May only exist as a paper plan before the event such as activating dormant transport contracts or calling in volunteers to open a shelter.
Type III	Extending group	Construction company that uses its plant to assist in rescue.
Type IV	Emergent group	Survivors self-rescue efforts or experts from above organisations meeting for the duration of a crisis.

In many jurisdictions, the roles of the established organisations are augmented or even replaced by voluntary and not-for-profit organisations that share similar hierarchical structures, goals, selection, training, credentialing, accountability and budgets. Invariably they are included in the pre-planned response but individuals may be organised volunteers and simultaneously be members of established organisations sharing similar aims, eg. health service professionals in the military reserves or NGOs, and subject to contemporaneous mobilisation. In line with Whittaker et al. (2015) who used the DRC typology to distinguish *informal volunteerism* in Australia, the voluntary sector is considered part of the established response.

More recently Boin and Bynander (2015) used the DRC typology in their exploration of collaboration and coordination in crises which I shall return to later when discussing leadership. Their interest was in the tension at "intersection of two worlds" (p2) where Type I established organisations arrive to meet the Type IV emergent groups that had been dealing until then (Jarzablowski et al. 2012).

The context in which an organisation operates led Hannah et al. (2009) to attempt an organisational typology for *extreme* contexts (p899), involving a threshold of "intolerable magnitude" where life may be at stake. They categorise four such types of organisation:

I.   On a global scale, many people are employed in what the authors' term *trauma organisations* which are largely reactive and manage both surges in demand for their services and a safe working environment concomitant with objectives, for instance in emergencies. This is achieved through learning and professionalism because incidents are largely predictable and frequently repeated e.g. fire and rescue or trauma services.

II.   Whilst sharing some features of the above, *critical action organisations* (CAOs) deal with fewer incidents but they have bigger consequences, for instance at the tactical level a specialist hostage rescue team and at the strategic level the negotiators. Leaders, followers, and others involved share risks of extreme psycho-social and/or physical harm perhaps without the option of replacement for key staff who become overwhelmed or casualties.

III.   High Reliability Organisations (HROs) (LaPorte & Consolini 1991; LaPorte 1996) e.g. aviation and nuclear industries, are those "organisations that are able to manage and sustain almost error-free performance despite operating in hazardous conditions where the consequences of errors could be catastrophic" (Lekka 2011: v) and feature redundancy as a virtue rather than an extravagance. Redundancy as a means to avoid system failure may involve backup arrangements, cross-functionality or duplication (Nowell et al. 2017). HROs may be challenged or stimulated by novel circumstances.

IV.   Last in Hannah et al's (2009) typology are the *naive organisations*. These are the organisations and their leadership that become involved in unforeseen crises sometimes as collateral.

In the above typology, the naïve organisation is passive and whereas the other types may select and train staff with both performance and self-resiliency in mind, most naïve organisations are unlikely to have invested in either, although this is changing. For

instance, the number of shooting incidents in schools and colleges averages one per week in the USA (Everytown 2016) so that training in incident management for education principals is readily available (Muffet-Willett 2010). In the UK, many of what would once have been thought of as naïve organisations such as shopping centres are now recognised as terrorist targets with appropriate staff training programmes e.g. Project Argus (Malcolm 2013), see chapter III.

A wide variety of institutions that the DRC typology would consider expanding, extending and emergent organisations might be drawn in to the response to a crisis and may all be described initially as naïve in the Hannah et al (2009) typology. Although it is not explicit the discussion in the remainder of this chapter is more relevant to the established organisations which usually have pre-planned roles, responsibilities and resources.

2.2. Incident Command Systems

In all jurisdictions and at all levels the immediate response to incidents has the same aims: the protection of people and property, and the restoration of normal life, a responsibility vested largely in *established organisations*. How this is achieved varies because of different risks, vulnerabilities, resources, and communications as well as the capabilities of the responsible agencies (Boersma et al. 2014) but the mechanism is the *incident command system.* This facilitates the rapid gathering of resources, known among practitioners as the surge, and the control of the temporary organisation of different professional groups that forms at the scene of the incident (Bigley & Roberts 2001). It is likely that a crisis first manifests in a local incident and the development of the crisis might be that the incident "reveals a failure of the rules, norms, behaviour or infrastructure used to handle that type of surprise" (Longstaff 2005:16).

US Incident Command System

Different systems have evolved from the original rigid military command and control structure. The earliest was the Incident Command System (ICS), developed in the 1970s to fight widespread wildfires in California, and adopted by FEMA for controlling the range of government agencies that respond to an incident (Bigley & Roberts 2001). It was revised after Hurricane Katrina (figure 1.) claiming that it now "clarified roles of private sector, NGOs, and chief elected and appointed officials" and was included in the

National Incident Management System (NIMS) (US DHS 2008: i). It requires that all communities use the system so that it "institutionalizes … response practices" (ibid).

Each of the functions shown in figure 1. has up to six sub-functions and all require expertise and training. Supporting the incident commander are jurisdictional and functional Emergency Operations Centres (EOC) of varying standard: Lutz and Lindell (2008) identified 22 EOCs operating during Hurricane Rita 2005 in Texas alone. The history of the adoption of ICS in the US and its effectiveness is given by Buck, Trainor and Aguirre (2006) but significantly they noted that it required "training and shared experiences … to develop technical confidence and interpersonal trust in each other" (p14) to be effective.

Figure 1: US NIMS Incident Command Structure (US DHS 2008: 53)
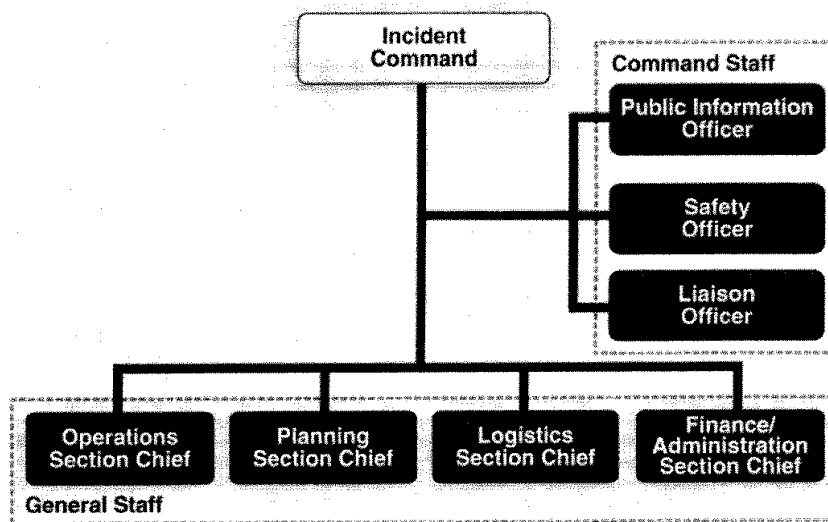
UK Arrangements

In contrast to the US as we saw in Chapter 3 the UK system has evolved, initially without budget, performance measures, statutory duty, or structure, except that which emerged operationally, the *GOLD-SILVER-BRONZE* hierarchy (LESLP 1993, 2012). The modest guidance (Home Office 1992a, 1992b; Cabinet Office 2012a) and policy (Cabinet Office 2013b, 2015b) has only been available relatively recently. Hence response is less structured with the emergency services, acting separately or jointly, drawing support from a wide range of other groups, where the DRC types (Dynes 1970) can be observed interacting as the response grows. This is coordinated by a three-tier structure, where

GOLD is the strategic level and may be divorced from the scene, SILVER is the tactical level, and BRONZE is the operational level (Figure 2). It evolved from where a role, not a rank, based hierarchy was needed for both pre-planned events and spontaneous disorder (College of Policing 2016).   Its strength is its ability to absorb incoming resources as they are mobilised into a very flat hierarchy with single Gold and Silver commands but many Bronzes, and hence it was adapted to multi-agency coordination (LESLP 1992; Pearce & Fortune 1995; Arbuthnot 2008). It has attracted little attention considering that it is still used daily across the UK (Flin & Slaven 1995, 1996; Flin 2008; Devitt 2009) although there have been occasional concerns about inter-agency communications and coordination at major incidents (New 1992; Home Office 2006; Briggs et al. 2011; Pollock 2013).

The UK system relies greatly on professional cooperation because each emergency service adopts this structure independently with different administrative and cultural norms as well as different lead ministries, and budgets (Allen et al. 2011).   Despite this and following the European Interoperability Framework Directive (EC 2010) a new doctrine was introduced to formalise this cooperation, the Joint Emergency Services Interoperability Programme (JESIP) (JESIP 2013), which defines interoperability as "the extent to which organisations can work together coherently as a matter of course". JESIP was originally about interoperability at incidents but is now as much about achieving savings through partnerships to cover staff shortfalls, sharing bases, procurement, and control rooms (Emergency Services Collaboration Working Group 2015), as outlined in a speech in November 2014 by a junior minister (Mordant 2014).

Figure 2: The UK Gold-Silver-Bronze ICS (College of Policing 2016: 5)
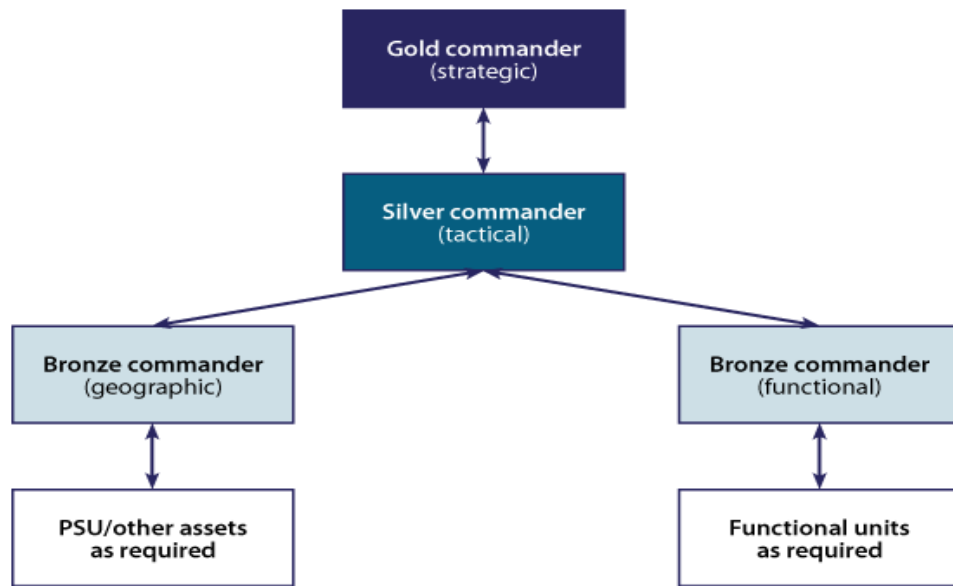
If an incident is considered too big for local resolution, policy in the Concept of Operations (Cabinet Office 2010) contains a political structure above that of the local level, "colloquially described" as the GOLD level (para 1.7), that can be implemented. This is usually a political rather than operational decision because of the loose definitions, see Table 3, with different arrangements in the devolved administrations and additional policies for certain government departments (ibid).

Table 3: Degree of political involvement in the UK (Cabinet Office 2010)

Type of incident	Classification	Involvement
Local response only		Single scene, routine
Local	*major incident*	Neighbouring services
Level 1.	*significant*	Dept. of Communities & Local Government liaison.
Level 2.	*serious*	Regional, with a coordinated central response from COBR (see page 30) and Lead Government Department(s).
Level 3.	*catastrophic*	National involvement, centrally directed from COBR.

A Level 3 *catastrophic* emergency has an "exceptionally high and potentially widespread impact and requires immediate central government direction and support", e.g. if the local responders are overwhelmed or emergency powers need to be invoked, and is overseen by the Prime Minister (ibid: 1.8). Hints of poor leadership at any level or lack of adequate resources for a foreseeable risk can elevate the political interest. This is likely to be further complicated by the new additional political levels of elected city mayors and Police and Crime Commissioners and the blurring of the traditional non-interference by politicians in operational matters. The convening of a crisis meeting, known as COBR (ibid), is sometimes announced such as for the attempted coup in Turkey (Prime Minister's Office 2016) but the statistics, proceedings, and processes are secret, quite different to the transparent and rigid structure of the US.

3. CRISIS MANAGEMENT AND CRISIS LEADERSHIP

The oft quoted Bennis & Nanus (1985) position that "Managers are people who do things right and leaders are people who do the right thing" where the choice is between "activities of vision and judgment (effectiveness) verses activities of mastering routine (efficiency)" (p21) is an attractive heuristic but in complex bureaucracies the distinction is less clear. Whilst Brookes (2008) was summarising a series of seminars about the transition from New Public Management (NPM) to Leadership (NPL) in the UK, he described management to be a "mechanical concept" yet he included "controlling and problem solving" as management functions whilst emphasising the "personal impact" of leadership as "vitally important" in "motivating and inspiring" (pp11-13). Later, Brookes & Grint (2010) in the same research programme found leadership and management to be "distinctive and complimentary", illustrated by the solving by management of *tame* but often extensive problems rather than the *wicked* problem where the leaders "facilitate a collective vision and strategies to produce the changes needed" (p11) borrowing the typology of Rittel and Webber (1973) and expanded by Grint (2005).

3.1. Crisis Management

The reference to wicked problems above, discussed in chapter II, leads us to the specifics of crisis. It is not simply that crisis management is management applied to crises. It is a term used loosely as "the sum of activities aimed at minimising the impact of a crisis" (Boin et al. 2013: 81) and, since it includes all the non-routine measures that are activated to meet the crisis (BSI 2011), leadership is implicit (Heath 1998; Coombs

2007; Crandall et al. 2010). Management, Gilpin and Murphy (2008) argue, "implies a level of control … that does not exist in most crisis situations" (p7) whilst Lalonde and Roux-Dufort (2013) consider crisis management paradoxical because the two parts are contradictory. Crisis management is also used to describe the strategic capacity building and conflict resolution of European states (Frisell & Oredsson 2006; Larson et al. 2005), very much leadership tasks. With a public sector leaning, Uhl-Bien et al. (2007) suggest that at least before a crisis both leaders and managers are the collective *administrative leaders* that "plan and coordinate to accomplish organisationally prescribed outcomes" (p305) such as preparing for high-impact but unlikely events.

Van Wart & Kapucu (2011) in a US context sought to draft what they describe as an operational definition of crisis management by separating it from emergency management, arguing that emergency management seeks to prevent or mitigate emergencies, using a combination of plans and resources, the inference being that emergencies are foreseeable. A timely response is important, for instance to a house fire or violent attack, and this efficiency is achieved by preplanning and training. In contrast, they suggest crisis management which they link to "catastrophic disaster management" (p491) is a special form of change management, that is sudden, forced and unplanned, "typified by surprise, or uncertainty in planning contexts, due to unexpectedness or size of an incident, short time frame, and criticality in terms of life-and-death consequences or organisational threat" (p496).

Rather than separating leadership and management functions, **t**he US National Preparedness Leadership Initiative programme (McNulty 2013) describes the shift in emphasis from management to leadership as a crisis develops. This representation (Figure 3) reflects importance rather than activity since leadership decisions may require concurrent large-scale mobilisation of resources requiring considerable management skill and planning.

Figure 3: Balancing the management–leadership continuum (McNulty 2013)
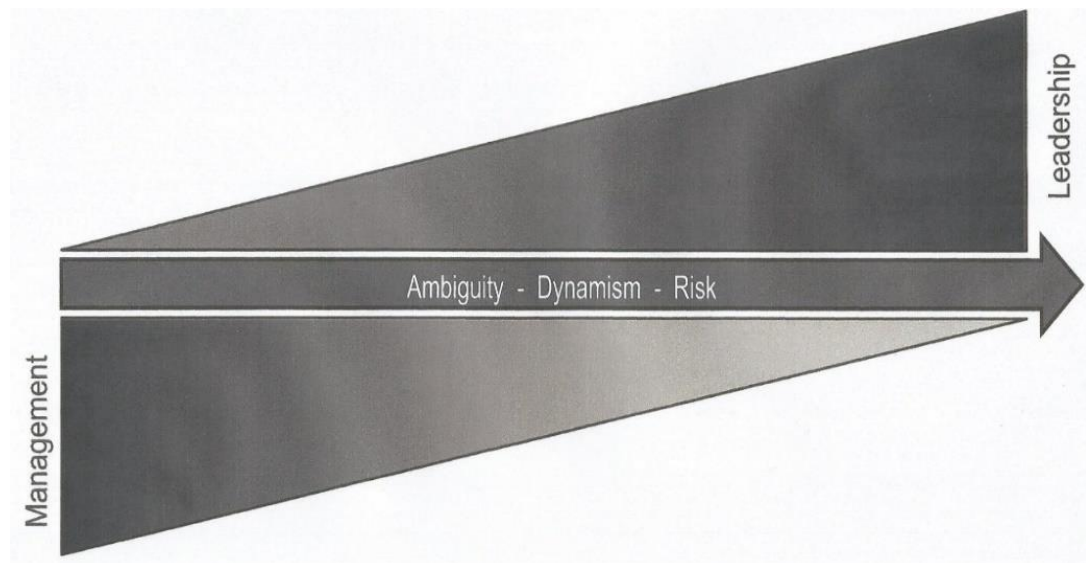
The 1998 North American Ice Storm in Quebec and the resulting power outage affecting a million people was used as a case study by Lalonde (2004) to study the performance of public sector managers.   She found three archetypes of manager: the *collectivists* who try to fulfil the different needs of various communities and municipalities; the *integrators* defined "by their rigor and their preoccupation with finding the best positioning and organisational fit"; and the *reactives* who are predisposed to react quickly which puts pressure on their colleagues (p83).   In terms of crisis management, she found that the collectivists, based in rural areas with more independence, performed best.   They could be further broken down into: *humanists,* concerned with people's well-being; the *pragmatists* who will "offer whatever is asked of them based on their capacities and consult the judgement of fellow professionals to establish services"; and lastly the *anti-conformist*.   The last of these acts on principles related to his or her community, not the plan.   She noted that the collectivists also appeared to display the most leadership, perhaps by virtue of their locations (Lalonde 2004).

In contrast to Lalonde's limited data Olejarski and Garnett (2010) studied some of the actors involved in the Hurricane Katrina crisis and found ample evidence to support Lalonde's archetypes but added a fourth, the *paralytic manager*, who delays or withholds decisions that may be required, fails to collaborate or fails to recognise the situation.   This may manifest as lack of awareness or lack of involvement, perhaps unquestioning faith that everything will be alright.   Neither Lalonde (2004) nor Olejarski

and Garnett (2010) are able to avoid discussing leadership as an aspect of crisis management, underlining the close link.

3.2. Crisis leadership

There is a considerable literature about leaders, their qualities, and leadership in its various forms, with definitions that are as elusive as that of crisis such that "there are almost as many different definitions of leadership as there are persons who have attempted to define it" (Stogdill 1974: 259) and much continues to be added (Avolio et al. 2009). The earlier discussion of the DRC typology **(**Dynes 1970) and the organisational response to crisis indicated the diversity of those that might be involved and the challenges in coordinating them. Coordination is the favoured term among practitioners in civilian contexts, rather than leadership or command, as it acknowledges the independence of diverse organisations yet reminds them of the immediate tasks and goals. In keeping with this I believe the distillation of Burns (2003) that the "distinctive role of leadership at the outset is that leaders take the initiative… The first act is decisive because it breaks up a static situation and establishes a relationship." (p172) is particularly relevant to crisis.

Strategic crisis leadership

Whilst the distinction between crisis management and leadership may often not be clear, for strategic leaders, those elite relatively small overlapping and dominant groups that share decisions of national importance (Mills 1956), their leadership role is clear. Some insight into how strategic leaders and their teams operate in foreign affairs is given by Schaffer and Crichlow (2010) who looked for high-quality decision making and sought to test the widely accepted 'groupthink' phenomenon of Janis (1972). They examined a range of foreign policy crises over a thirty-year period.   The leadership characteristics and quality of the decisions taken by the groups were judged using Hermann's (1999) leadership traits including: belief in ability to control events; the need for power; self-confidence; task focus; conceptual complexity; and distrust. In every crisis, the policy groups had to coordinate large complex bureaucracies to implement decisions and one issue that Schaffer and Crichlow (2010) found was that in several problematic cases the heart of the problem seemed to reside in a "contentious and damaging rivalry" between key foreign policy advisors. Thus, whilst "too much in-group cohesion can be problematic [i.e. groupthink] ... too little cohesion may be just as bad or

worse" (p249). They conclude that "It takes a strong leader to invite competing voices to be heard and at the same time manage them and get them to work efficaciously as a team" (p249).

Mayors in large cities, many of whom control budgets comparable to nation states and whose influence is similarly extensive (Barber 2014), may be included among elite strategic leaders.   A recent meta-review of the performance and effectiveness of mayors in crises between 1989 and 2014 was conducted by Jong et al. (2016) based on 34 peer-reviewed studies. The reported performance of the mayors was judged against the five critical tasks of Boin et al. (2005) namely: sense making, that is identifying from hazy information what the threat or risk is; decision making; meaning making which is the communication of the situation to the public; terminating; and learning. Disappointingly they found that "the literature reviewed offers little by way of guidance, general or otherwise, on how to operationalise these tasks in effective ways" (p56).

The outcome for crisis managers and leaders varies greatly and sometimes unpredictably. In what reads as a textbook for public service crisis managers Drennan and McConnell (2007) comment that "Elites routinely suffer an onslaught of scrutiny and criticism" but this does "not normally involve the career slaughter of those in positions of authority" (p178). The main factors in survival or even an upturn in fortune are suggested as low saliency, lack of blame in the public inquiry, strategies to undermine critics, or for politicians the support of their party and/or the opposition, and for public servants the support of the relevant policy community. Poor performance in any of these could lead to a "decline in fortunes" (p186).

It could be argued that strategic leaders are likely to be based in the established organisations of the DRC typology (Dynes 1970), both private and public sectors, with international, national and cities being the largest. Surrounding strategic leaders and in the next layers of society are many other politicians, professional advisers, and officials operating in all DRC types and faced with Boin et al.'s (2005) five critical tasks above. The reality of crises is that, unlike fires, transport accidents, and floods, they do not announce themselves so that managers and leaders must often "recognise from vague, ambivalent and contradictory signals that something out of the ordinary is developing" (p10).   Only then can decisions be taken and the situation framed in such a way that stakeholders and the public understand, a first step in dealing with the crisis.

Boin et al. (2005) remind us that terminating crisis management arrangements is fraught with difficulty as operations are downsized, sometimes with rescue and recovery activities incomplete, whilst the often protracted return to normality needs to be managed in a way that is sympathetic to the affected communities. It might be expected that following a crisis the opportunity would be taken to study the lessons and feed them back into policies and practices but this can be at odds with the "good chance to clean up and start anew" (p15), another facet of crisis.   However, from a commercial perspective James et al. (2011) remark on the advantages that learning can bring to firms in limiting their exposure to similar crises in the future and the opportunities that a learning-focussed leader could identify. In conclusion Boin et al (2005) acknowledge the importance of crisis leaders but as "designers, facilitators, and guardians of an institutional arrangement" within bureaucracies rather than lone all-powerful decision makers (p64).

Returning to the research by Van Wart and Kapucu (2011) mentioned above. They surveyed a sample of experienced emergency managers about the qualities of a crisis leader based on several generic competencies (Van Wart 2004). One third of generic leadership qualities were not mentioned by respondents whereas the *willingness to assume responsibility* was most widely selected with one respondent commenting "the successful leaders are the ones who have the willingness to accept responsibilities outside their experience and training" and another that "some [their peers] will seek or emerge to take on greater responsibility, others will step up if encouraged and guided, and only a few will resist" (p501). This willingness to assume responsibility is something that Devitt (2009) found in her study of a strategic level (GOLD) incident commanders' exercise where one participant commented that "you have to like being a Gold commander and that adrenalin buzz" (p160).

How crisis leaders should be assessed was taken further by Boin et al. (2013) who expanded the list of Boin et al. (2005) from five to nine headings to include early recognition, coordination, systems management, and enhanced resilience through pre-crisis preparations. In later years, foresight (Habegger 2010: Foresight Project 2012; Turoff et al. 2013), horizon scanning (Schultz 2006; Amanatidou et al. 2012; Konnola et al. 2012) and risk assessment (Cabinet Office 2017) have come to prominence for practitioners to facilitate early recognition and sense making (Cabinet Office 2013). Boin et al. (2013) refer to "orchestrating vertical and horizontal coordination" (p83)

which translates for practical purposes into intra-agency coordination (Leigh et al. 2012; Pollock & Coles 2015) and the multi-organisational meta-leadership of Marcus et al. (2015). *Coordination* can be used by crisis practitioners as a euphemism for leadership or command and is discussed in the next chapter.

Given the nature of crises there are qualities associated with crisis leadership such as creativity, improvisation, flexibility and intuition. Kendra and Wachtendorf (2002) took the 9/11 attack on New York as their case study to look for evidence of creativity and improvisation, sub-dividing creativity into individual *entrepreneurial creativity* (Amabile 1997) and *organisational creativity* (Woodman et al. 1993), the latter the result of individual entrepreneurs working together. They use Amabile's entrepreneurial definition of "the production of novel and appropriate solutions to open-ended problems" (1997: 18) which can be within an existing organisation but must involve successful implementation. Crisis adds urgency to creativity and Kendra & Wachtendorf (2002) linked creativity to the emergence of community responses in disasters and improvisation in the response. They subsequently developed a self-explanatory typology for improvisation that comprised *reproductive improvisation* where an existing capability is revived, *adaptive improvisation* where an existing plan is amended to deal with changing circumstances, and *creative improvisation* which involves an entirely new response where none existed (Kendra & Wachtendorf 2006).

In this and their other work they highlight the waterborne evacuation of Manhattan as an exemplar of creativity and improvisation (Kendra et al. 2003), an event that I shall return to with a different perspective in subsequent chapters when discussing the emergent response to crisis. Allied to improvisation, bricolage involves solving problems using what is to hand and not waiting for optimal resources. This could be using a smart phone in lieu of a crisis centre but the term is often used as a synonym for improvisation (Cunha et al. 1999).

To those who are inherently creative and comfortable with lateral thinking improvisation comes easily and examples given in the literature such as the evacuation of Manhattan above or the use of high-draught vehicles by the National Guard in the response to Hurricane Camille (Mendonca & Wallace 2004; 2007) seem like overstating the obvious especially to practitioners. However, the post event political judgement on 9/11 was that it exposed the lack of imagination in the bureaucracies responsible for intelligence and risk assessments (US National Commission on Terrorist Attacks upon

the United States 2004: 344 & 2011: 475) and a subsequent lack of awareness prior to Hurricane Katrina (US House of Representatives 2006), so that it clearly is an issue.

3.3. Leadership that fits the problem

Grint (2005 & 2010) offers a heuristic model that can help delineate crisis management, incident command, and crisis leadership by matching them to context. Grint takes Rittel and Webber's (1973) typology of t*ame* and w*icked* p*roblems*, and adds his own c*ritical problems*, the equivalent of routine but life-threatening emergencies or incidents. The latter present as self-evident with little time for decision-making and action where the incident commander knows what must be done or at least conceals any uncertainty (Grint 2005: 1473) for example a plane crash, traffic accident or terrorist attack. We put our trust, at least temporarily, in those who we perceive to be able to resolve the problem. A *tame problem* may be complicated but it is likely to have happened before and resolution is possible which fits it for a *managerial* solution. The current policy of Resilience is an example. A *wicked problem* is complex and often intractable with a huge degree of uncertainty, similar to a crisis, which Grint associates with *leadership*.

Having established his three types of problems Grint uses Etzioni's (1964) typology of power to match them i.e. *coercive, calculative,* and *normative compliance*. Coercive power, or hard power (Nye 2004), he suggests would rest with institutions such as the military and the emergency services i.e. command, and is suited to critical problems. Calculative power he attributes to companies and departments facing tame problems and hence management is appropriate. Normative compliance is value based and he suggests that this fits well with wicked problems and crises and the use of soft power (Nye 2004), consultation and persuasion, i.e. leadership. Figure 4 is a simplified illustration of this relationship.

Figure 4: Typology of problems, power, and authority (from Grint 2005: 1477)
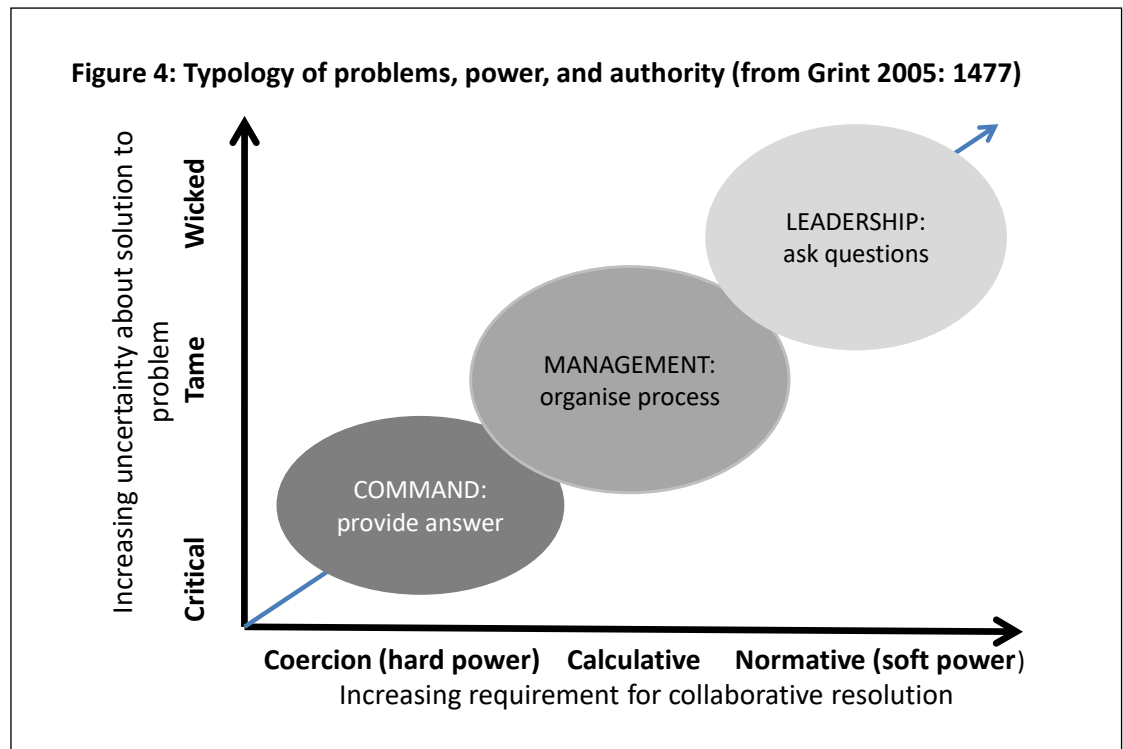
Based on my own experience I would contend that although the military and emergency services appear to share the same respect for rank or coercive power, command for the latter is a collective contract between commanders and followers based on recognition of experience and knowledge plus personality, including faults (Pescosolido 2002). The intentions of the commander can be thwarted by operatives (Rake & Nja 2009) or their peers in multi-agency incidents (Moynihan 2007).

The model is a useful tool for reflection but as Grint acknowledges leaders "will switch between the Command, Management and Leadership roles as they perceive – and constitute – the problem as Critical, Tame or Wicked, or even as a single problem that itself shifts across these boundaries" (2005: 1475). This has been translated into practice by the section *Know when to lead, command and manage* in UN policing guidelines which acknowledges that an officer "may be called upon to do one or all of these at the same time" (UN DPKO-DFS 2016:4).

Incident command and crisis leadership are about decision making in uncertainty and under pressure. Realisation that conventional approaches by psychologists to studying decision making were not appropriate for the needs of fast changing emergency scenarios led to the evolution of the Naturalistic Decision Making (NDM) model.

Defined by Zsamboc (1997) as "… the way people use their experience to make decisions in a field setting" (p4) she went on to summarise the drivers for NDM which subsequent writers including Flin & Crichton (2004), Montgomery et al. (2005), and Flin (2008) refer back to:

- ill-structured problems,

- uncertain and dynamic environment unlike simulated situations,

- shifting, ill-defined, or competing goals, with decisions leading to feedback loops,

- stress caused by lack of time, and

- real consequences for the decision maker, even life or death.

A supplementary model, Recognition-Primed Decision Making (RPD), suggests that through their experience decision-makers acquire a "repertoire of patterns" (Klein 2008). If cues from the situation match a pattern they "can successfully make extremely rapid decisions" (p457). Not only that, researchers noticed that fire commanders were able to play out their decisions in their heads to see what the outcomes might be (ibid). Command can be a misnomer because, as Rake & Nja (2009) observed, at incidents dealt with by the fire service, the incident commanders gave few commands relying on "the influence from tacitly understood routines and procedures" (p682) perhaps as a collective form of RPD. NDM is still an active area of research (Allen et al. 2011 and Groenendaal & Helsloot 2015) and comfortably fits with Grint's (2005) critical problems and coercive authority as command.

4. CONCLUSION

In this chapter I have outlined two typologies, Dynes (1970) and Hannah et al. (2009) to further our understanding of the response to conventional crises. I followed this with an outline of the US and UK incident response systems both of which have been adopted internationally. I then discussed the commonly used and all-embracing concept of crisis management and the less familiar crisis leadership before turning to Grint's (2005) heuristic and the Naturalistic Decision Making model (Zsamboc 1997) to illustrate the differences and the overlaps with incident command.

The other organisations involved in crisis management, the expanding, extending, and emergent organisations may have evolved less hierarchical and more open models of

leadership, such as *collaborative, collective, emergent, distributed*, shared, and *co-leadership* (Bolden 2011: 252). Since none of these were developed in the context of crisis, especially for the novel crisis paradigm, in the next chapter I shall adopt the label of *emergent crisis leadership* that draws on these leadership concepts to describe the circumstances of the response to crisis.

The ideas of Leonard & Howitt (2013) about crisis leadership in the context of future mega-crises, akin to the *novel* crisis paradigm, provide a link between the leadership of the established organisations and the emergent crisis leadership of the next chapter. They note that leaders must be still be able to exploit the efficiencies that come from "in the moment" leadership for predictable events, perhaps utilising incident command systems, but must also recognise the "appearance of novelty that may invalidate ordinary tactics" (p26) used by the established systems and require innovation.

CHAPTER VI: EMERGENT CRISIS LEADERSHIP

1. INTRODUCTION

In the last chapter I reviewed the organisational typologies of crisis management before going on to look at crisis leadership and incident command that are largely associated with the DRC's *established* organisations (Dynes 1970). Whilst this is still relevant the hierarchical vertically structured approach to crisis management is changing in keeping with the shift of public administration towards collaborative governance and its associated leadership (Getha-Taylor & Morse 2013). The need for organisations to work effectively in a crisis, or even less taxing routine emergencies, requires a wide range of skills that can span the gaps between public and private organisations as well as between their internal divisions (Comfort & Kapucu 2006).

1.1. Crisis leadership or coordination?

Whilst there is an overwhelming literature on leadership supporting many specialist journals leadership is rarely mentioned by practitioners who, perhaps in recognition of boundaries and sensitivities, substitute the term coordination. Nevertheless, the definition of situational leadership offered by Pearce and Conger (2003: 1) of "a dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organisational goals or both" seems to aptly describe crisis coordination. They go on to say that "this process often involves peer, or lateral, influence and at other times involves upwards or downward hierarchical influence" (ibid) which aptly describes what takes place in the temporary organisations that form in response to crisis. Drabek (1983) labelled such structures *Emergent Multi-Organisational Networks* (EMONs) but this was in the context of operational emergency response that was anchored in the established services, revisited by Owen et al. (2013). I use the concept to represent the more complex and dispersed arrangements that form in response to crisis (Uhr 2009; Rubens 2015) based on trust and peer recognition, and increasingly virtual in nature.

In managing a crisis, organisations that might at other times be competing for resources and influence are required to work together at all levels to overcome the "Robinson Crusoe syndrome" or "only ones on the island" of Auf der Heide (1989: 56) and are dependent on "the tact and sensitivity of key officials, and the willingness to de-emphasise organisational claims of leadership" (Quarantelli 1997: 48 in Drabek & McEntire 2002: 209). Having spent much of my career in capacity building or

responding to events through such multi-organisational structures I feel that Badaracco's concept of *quiet leaders* aptly sums up those key individuals:

> "They're often not at the top of organisations. They often don't have the spotlight and publicity on them. They think of themselves modestly; they often don't even think of themselves as leaders. But they are acting quietly, effectively, with political astuteness, to basically make things better, sometimes much better than they would otherwise be" (Lagace 2002: 2).

Quarantelli (1997) included the "development of overall coordination" in his ten criteria for disaster management stressing that it was "critically dependent on how officials handle the problem of integrating organisational and community responses" (p48) which was in parallel to the need to "blend emergent aspects with established ones" (p49). All this was well before the emergence of multi-organisational networks (EMONs) and coordination became an issue in the response to Katrina or the modern Australian wildfires (Owen et al. 2013, Curnin et al. 2015).

In this chapter I will explore the emergence of crisis networks and the important part played in them by knowledge and scientific advice. I use the contentious example of the civil-military networks that are now common in crisis response to illustrate the challenge of replacing the command and control model and I conclude with a discussion of *emergent crisis leadership.* This is where leadership emerges from the context or situation and where the role is unplanned and unprecedented. It can arise from the grass roots of communities, including online and social media groups, or it can be within an organisation or born of networking and multi-agency coordination.

2. THE EMERGENCE OF CRISIS ORGANISATION

2.1. Grass roots community

Whether prepared or not the scale or novelty of extreme events may cause a breakdown in communication and information flow as well as shortages in personnel and resources (Majchrzak et al. 2007). This may last several days as in Hurricane Katrina (Bluestein 2005; US Senate Committee on Homeland Security and Governmental Affairs 2006) and may lead to ad hoc improvised responses to fill the gaps (Wachtendorf 2004). The initial response by neighbours and the community was reported by Dynes et al. (1972) and Dynes and Quarantelli (1977). It was revisited by Kreps (1992) when describing the "false images versus realism in emergency management" (p167). Contrary to the assumption that victims are helpless it should be assumed in planning

that people will take the initiative and not wait for assistance. He added "timely coordination is more important than leadership" (ibid) where leadership referred to the upper level of officialdom.

The phenomenon of social groups that emerge in response to a disaster has been historically recognised by researchers and defined by Stallings and Quarantelli (1985) as "…private citizens who work together in pursuit of collective goals relevant to actual or potential disasters but whose organisation has not yet become institutionalised" (p94). Bosworth and Kreps (1986) described such groups as having four characteristics: domain with boundaries that distinguish one group from another; tasks or divisions of labour; resources and capacities; and activities which are the combined activities of individuals or social groups.

2.2. Ephemeral organisations

At about this time Lanzara (1983) looked at what he termed *ephemeral organisations* that form in response to a humanitarian need and then disband. The context for this was the 1980 earthquake in southern Italy which killed 3,000 people, injured 8,842 and left 450,000 homeless. The official response was slow and ineffective and the media coverage inspired many to converge and offer help. This led Lanzara to observe "the loose environment generated by the impact while lowering the effectiveness of formal organisations, contains many features that enhance the emergence and performance of ephemeral organisations" (p73). Such groups ranged from *extending* and *expanding* organisations after Dyne's typology (1970) to individuals and small groups. It was estimated that 6,000 volunteers responded against the 18,000 rescuers of the official agencies. However, the different methods of working between these groups and the formal organisations, such as an open market, direct transactions and face-to-face relationships versus procedures, vertical transactions, directives and bureaucracy, led to tension and obstructions. This "help or oppose" feature was later described by Uhl-Bien et al. (2007: 305) as *entanglement* between the top-down administrative forces and the bottom-up emergent forces, reflecting the multi-dimensional nature.

2.3. Emergent response groups

The challenge of coordinating the efforts of people and groups with expertise but where no prexisting structures, teams or roles existed was addressed by Majchrzak et al. (2007) applying Transactive Memory Systems (TMS) theory. This is an organisation science theory of knowledge coordination among groups outlined later in this chapter in

relation to expert advice for crisis leaders. They followed up the observations of *emergent social groups* in disasters by researchers including Drabek and McEntire (2003) and Tierney and Trainor (2004) defining such groups as *"*characterised by a sense of great urgency and high levels of interdependence, operating in environments that are constantly changing as new information arrives". This could apply to some teams from the statutory services in a disaster except that this "… volatility and the need to adapt create unstable task definitions, flexible task assignments, fleeting membership, and pursuit of multiple simultaneous, possibly conflicting purposes" (Majchrzak et al. 2007: 148).

Whereas corporate, organised volunteers, and public leadership groups, such as those in incident management systems, are role-based with recognised membership and procedures, emergent response groups have members who stay only whilst they feel the need or feel they can assist. They may represent a community association or may attach themselves for less altruistic reasons. The group may not know each other beforehand and may disperse afterwards without leaving records or having a debriefing. Unlike organised groups emergent groups probably have no planning or training and there is poor or non-existent communication, at least initially. Within the group benchmarking of expertise and establishing trust may be difficult and as the situation improves the original purpose of the group may evolve into one of putting pressure on public services to perform better or to be represented in the recovery programme.

More recently Vallance and Carlton (2015) took the earthquake in Canterbury NZ in 2011 as their case study and relying initially on data from an inventory of post event social activities and groups (Fitt 2011) found that within hours of the earthquake many community groups, NGOs, and faith-based groups, as well as social media responded and later the more organised groups began to link into the formal recovery processes. A subsequent inventory by them found that most of the groups still active 4 years later had been in operation before the earthquakes and had extended their role to include recovery on top of their core business. The authors suggest that the general capabilities that community groups have, to organise and chair meetings, lobby, arrange sporting events and concerts, distribute newsletters, and fund-raise, all of which display informal leadership, form a core upon which disaster risk reduction can be overlaid utilising the potential of those who are "first to respond, last to leave" (p 34).

Emergency response groups are diverse but have certain common characteristics noted above which they share with networks of organisations, both established and ad hoc,

that were not established with crisis response in mind and which have different aims and values.   Particularly in novel crises they unexpectedly find themselves "executing unpractised, creative, and never-before-tried combinations of existing capacities" (Leonard & Howitt 2012: slide 13).

 Table 4. explores the characteristics of the categories of crisis response organisations inspired by Lanzara (1983:88), incorporating Dynes' typology of established, extending, expanding, and emergent organisations, as well as the comparison of vertical and horizontal crisis arrangements by Burkle and Hayden (2001).

Table 4. Organisational characteristics of crisis

	Administrative includes NGOs/PMCs.	*Hybrid* intra-agency, inter-agency, bi-lateral and network arrangements	*Emergent* ad hoc community groups
Typology (Dynes 1970)	ESTABLISHED	EXTENDING >>> EXPANDING	EMERGENT
Leadership	Appointed, centralised, located, constant, supported	Emergent, ephemeral, confusing	Emergent, ephemeral, shifting, opportunist, and often lacking
Commitment	Professional with extrinsic rewards	Professional and self-motivated, institutionally competitive	Self-motivated with intrinsic rewards
Structure	Hierarchical	Heterarchical network, implicit hierarchy	Heterarchical network
Information flow	Vertical	Vertical and lateral	Lateral
Boundaries	Clear	Fuzzy	Fuzzy
Division of work	Highly differentiated, bureaucratic	Implicit but strict	Rudimentary
Tasking	Specialised, high levels of expertise	High levels of expertise	Non-specific, gap filling
Roles	Prescribed	Understood, emergent	Self-fulfilling
Rules/Procedures	Explicit, published	Implicit but strict	Implicit, varying
Activities	Institutionalised, domains	Ephemeral systems	Informal, need driven
Performance measures	Efficiency measures	Peer review and analysis	Visible effectiveness, goodwill
Public accountability & Media	Control	Avoid then control. Conscious of parent organisation's position.	Welcome or avoid, dependant on personalities.

I have labelled the formal or official established organisations and their leadership as *administrative* after Uhl-Bien et al. (2007). Administrative organisations set objectives, develop strategies, plan and coordinate tasks, acquire resources to achieve goals, and manage internal conflicts. This category includes government departments, NGOs, the domestic voluntary sector, corporate entities, e.g. health, military, power, transport, water, agriculture and some unlikely bedfellows such as PMCs and the private security industry.

My second category I have labelled the *hybrid* organisation to encompass the many aspects of both formal and informal crisis management including the response of the Emergent Multi-Organisational Network (EMON) concept of Drabek (1987) and the bi-lateral, inter-agency, intra-agency and multi-national arrangements that might be included under the umbrella or supra-organisation of Curwin and Owen (2013). *Hybrid* because the network could include administrative organisations of all shades interfacing with emergent community groups such as residents associations and faith groups that fit into a pre-arranged structure. Their inclusion helps to overcome the complaint voiced by Lasker et al. (2009) that "emergency response plans are developed without incorporating the knowledge of the people who need to be protected" (p661).

The third category includes the truly ad hoc emergent community groups such as the response groups described above (Lanzara (1983; Majchrzak, Jarvenpa & Hollingshead 2007; Vallance & Carlton 2015) but could also include online adhocracies (Dolan 2010) such as the Centre for Disease Control's *Team B* which takes a parallel and external view of outbreaks (Varley 2007), the *Rapid Reflection Force* of Lagadec, Beroux & Guilhou (2007 & 2008) and social media groups (Lindsay 2011; Veil, Buehner & Palenchar 2011). The latter came to the fore in the response to the Haiti Earthquake (Zook et al 2010), a blizzard (Birkbak 2012) and the Great East Japan Earthquake (Kaigo 2012). These unconventional social groups can quickly generate a global ephemeral community.

Frameworks and typologies are simplifications of social life (Gale et al 2013) but are useful in bridging the academic practitioner divide because they provide frameworks with which practitioners can reflect on and interpret their experiences and most importantly organise their tacit knowledge. The *hybrid* type is a label that covers a wide range of forms including collaboration between established organisations; some groups that are internal to established organisations and usually unseen such as IT and professional standards departments that may come to the fore; private sector suppliers, service providers and consultants; sources of expert advice; and any other groups and

individuals that have something to contribute to the response, especially to a novel crisis. There are two sides to this: the first may be the novelty of the event but the second may be the capacity and/or capability of those responsible for the response, moral or legislated.

Capacity and capability

Hood and Jackson (1992: 117) warned of the potential "recipe for disaster" that New Public Management might bring with its transfer of private sector practices to the public sector and the "downgrading of policy expertise", whilst Rhodes (1994) described the outsourcing of public services and the risk of removing capacity and capability, as the "hollowing out of the state" (p138). Busch and Given (2013) returned to this, recommending that to compensate "… agencies should recruit managers who are able to coordinate the actions of a wide range of public, private, and non-profit sector resources" (p18), the brokerage role described by Lind et al (2008) in relation to organisations that would not normally connect. It would be difficult to recruit such entrepreneurs in the public sector and so we must continue to rely on the emergence of such coordination (MacManus & Caruson 2011) which Marcum et al. (2012) suggest is most effective if it is not forced.

3. EXPERTS, ADVISORS AND KNOWLEDGE NETWORKS

An important facet of crisis management, given the generally complex nature of either the origin or the solution to a crisis, has been technical knowledge and advice, working with or against political and media advisors given that **"**policy makers and decision makers will tend to assess expert advice, however qualified, according to many criteria, only one of which happens to be the professional expertise involved" (Rosenthal & t' Hart 1991: 252). More recently the complexity of crises has led to individual advisors being replaced by groups of experts, often tapping into wider networks of expertise, the *knowledge commons* adapted for crisis by Comfort & Okada (2013). Observing emergent leadership in the Haiti 2010 and the Tohoku, Japan 2011 disasters, after delays by national governments, they remarked on the necessity and difficulty of "designing a forum in which this type of information search, exchange, and updating of obsolete information can occur easily and on a continuing basis" (p65). Expert advice is now an essential element of crisis decision-making similar to the dyad of clinicians and administrators in healthcare provision (Zismer & Brueggemann 2010; Patton & Pawar 2012).

3.1. Scientific advice in practice

In the United Kingdom, the BSE (bovine spongiform encephalopathy) crisis in the 1980s was a turning point when the Phillips Inquiry "eviscerated the structures and cultures of advice and decision-making" (Stilgoe & Burall 2015: 95) and concluded that the key was transparency and that uncertainty in science should be acknowledged with the deliberations of advisory groups being made public (Phillips with Bridgeman & Ferguson-Smith 2000). The changes are summarised in Table 5.

Table 5: Provision of scientific expertise (Stilgoe, Irwin & Jones 2006: 69)

Old model of expertise	New model of expertise
Closed	Open
Homogenous	Diverse
Hubristic	Humble
Demanding public trust	Trusting the public
Expecting expert consensus and prescription	Expecting plural and conditional advice
Managerial control	Distributed control
Presenting the evidence	Presenting evidence, judgement and uncertainty
Command and control	Collaboration and cooperation

Scientific advice in a crisis is furnished through the Scientific Advisory Group for Emergencies (SAGE) (BIS 2010, Cabinet Office 2012b) at either the local GOLD strategic group or the national COBR meeting but since the proceedings of COBR are classified the transparency recommended by the Phillips Inquiry is debatable.

More complex and long-term crises also benefit from scientific advice through the Foresight programme (Schultz 2006, Thomas 2008) which has produced reports on the international impact of climate change (Foresight 2011a), climate and migration (Foresight 2011b), and future disaster risks (Foresight 2012). Alongside SAGE the network of Chief Science Advisers representing all government departments can quickly convene to examine an issue and can draw in expertise from the private sector through the Prime Minister's Council for Science and Technology. Such arrangements exist in various forms in many other countries, some more transparent than others, notably the US (Beddington 2013). However, they are less structured and clear in the EU which is

currently considering options but is expected to follow suit (Wilsdon & Doubleday 2015).

3.2. Knowledge transfer

The issue of knowledge transfer (Fothergill 2000) between researchers and practitioners and the frustrations created is longstanding (NIgg 1982; Gori 1991; Malone 1993; Neal 1993) with Alexander (2007: 2) identifying the potential impasse as a "dialogue of the deaf" between researchers, practitioners and citizens.

Two climatologists, Feldman & Ingram (2009), focussed on knowledge networks and scientific advice for local environmental managers with implications for crisis management. They used four metaphors to describe the challenges to the provision and use of such information. There is the closed institution or *stovepipe* phenomenon where information is restricted to an academic discipline or rises up the hierarchy of the responding agencies and the *loading-dock* model where material is published but requires the potential user to know it is there, access it, understand it and use it. Alternatively, the *pipeline* moves knowledge directly from source to user with the danger that recipients are overwhelmed with material they may not understand. Finally, and particularly relevant in crisis, there is the *decision space* occupied by the decision-maker, possibly an elected official or politician with a different agenda, or an organisation constrained by role and responsibilities. There may also be an issue with internal procedures about how information is used in a bureaucracy especially if it is uncertain or probabilistic e.g. the 1 in 100-year flood. Another challenge is that the decision maker in a crisis must switch backwards and forwards between the big picture and the detail.

3.3. Heterarchical information sharing

Feldman & Ingram went on to look at knowledge networks and social interactions in decision support, defining a knowledge network as "built through such interactions across organisational boundaries, creating and conveying information useful for all participants from scientists to decision makers" (p12). To be effective knowledge networks may require the translation of technical terms into a form that can be understood by decision makers to counter the assumption that scientific information is automatically useful because of its origin. Bridging the gap requires knowledge and communication skill (p19).

An insight into knowledge sharing by national security professionals is given by Jarvenpaa and Majchrzak (2008) using Transactive Memory Systems (TMS) theory, that is organised knowledge held collectively by the group members or knowledge that they know others have and the processes they use to retrieve this. Ideally this means that the expertise of one individual can be shared by the group leading to trust and improved coordination or "who knows what and who knows who knows what" (p260). The aim was to see how the knowledge held by other professionals in a crisis can be quickly accessed when there may be conflicting interests such as commercial-in-confidence restrictions, reputation at risk, and value attached to information. They describe such groups as ego-centred networks because the professionals rely on prior contact rather than reputation from peer-reviewed research.

They point out that TMS theory had assumed that group members share the same goals but that is not the case in the mixed-motive situation generated by a crisis. Furthermore "others may know something but not have the necessary rights [e.g. security clearance] to share it for the specific context or problem, or may not share it because it may unduly harm their own organisations" (p261). TMS theory has also been used to explore emergent emergency response groups and improvisation in crises (Majchrzak et al. 2007) and police high-risk tactical teams where it was claimed that TMS in dynamic and unpredictable environments could enable better implicit coordination and situation awareness (Marques-Quinteiro et al 2013).

In Chapter V the relatively simple collaboration between services that forms at an incident was discussed but interoperability across the hybrid and supra-organisations that need to exchange information in a crisis is a big challenge. Researchers such as Andrienko and Andrienko (2006); Mishra et al. (2011); Allen et al. (2013); and Ley et al. (2014) have argued that technology could be used more to facilitate this. However, Reddick (2011) reminds us of the obstacles of security implications and lack of investment whilst Mendonca et al. (2007) summarised the limitations of ICT applications in this field because of the fallacies of "the hierarchical military model" where lateral information sharing is limited, hence the inability to achieve "situation awareness" (p46). In other words, ICT should fit the social structures and procedures and not be driven by what the technology can do. This was reinforced by Brooks and Fedorowicz (2010) who observed a multi-agency crisis exercise where although ICT was used, e.g. WebEOC, everything was duplicated in hard copy and displayed. This enabled people to glance at maps etc. without needing access to a workstation and newcomers to quickly

familiarise themselves. They also noted the importance of relationships involving "negotiation, persuasion, manipulation, and coercion" whilst there were frequent reminders that this was "horizontal collaborative" working rather than command and control (p207).

Analysis of communications traffic during the 9/11 attacks by Petrescu-Prahova and Butts (2005) used ICT in reverse to construct sociograms to map the networks that emerged. This revealed that a relatively small number of operators became coordinators and networked across channels revealing that the "unexpected lack of differentiation between specialist and non-specialist responder networks suggests the same processes may be governing emergent coordination in each" leading them to conclude the significance of "identifying the processes by which coordination emerges during the early phases of disaster" (p20).

Curnin et al. (2015) in the context of Australian bushfires have concluded that "… *liaison officers* at a strategic level are therefore crucial in facilitating the prescribed multi-agency coordination efforts and sustain them over time against a backdrop of changing demands and organisational involvement" (p301).

This is significant because although it smacks of re-inventing the wheel practitioners will have some familiarity with this concept which can be built on and applied to all organisations down to the smallest community group. An important point is that such groups and agencies do not need "to have the same situation awareness for all the elements in a system" but the facilitation of a "shared situation awareness" is an aim of the supra-organisation (p304).

The role of liaison officers is to develop the situation awareness, knowledge of intent, and limitations of both other organisations and their own bearing in mind that different agencies may have different objectives. As the *information orchestrator* (Bharosa, Janssen & Tan 2011) and *boundary spanner* (Janssen et al. 2010) of effective coordination and to some extent a *meta-leader* (Marcus et al. 2010) of the emergent hybrid ad hoc organisation, the ideal liaison officer has several roles. They are an information expert; collating, analysing, and disseminating information within their parent agency and across the supra-organisation; a lateral thinker accessing information from the most appropriate source; they resolve conflict avoiding frustrating delays; and a *legitimate enabler* with rapid access to decisions and authority, ideally anticipating such needs (Curnin et al. 2015).

3.4. Communicating uncertainty

At the strategic global level, there has been concern about communicating the uncertainty behind some scientific advice especially in relation to probability in the outputs of the IPCC that are intended for decision-makers where huge investment and policy decisions are at stake. The IPCC lead authors use a seven–step framework based on probability that ranges from <1% (extremely unlikely) through to >99% (certain) in accordance with IPCC guidelines (UN IPCC 2010). Given that the background of senior decision makers, and their lack of understanding of science when uncertainty is thus acknowledged in the advice, "the validity of its messages is dismissed" (Rickards et al. 2014: 4). A global survey of the understanding of the forecasts in the IPCC reports by Budescu et al. (2014) found that only 27% fully understood what the probability in the seven-step presentation meant yet a simple change from numerical values to descriptors greatly improved understanding (Gigerenzer & Edwards 2003).

This difficulty of communicating uncertainty through scientific advice was further explored in relation to volcanic eruptions which exhibit precursory phenomena with considerable uncertainty about the extent of the eruption and other impacts (Doyle et al. 2011 & 2014). The decision to evacuate is thus highly dependent on understanding scientific advice, illustrated by the advice given about aftershocks following the 2010 Canterbury and 2011 Christchurch earthquakes. "…A 23% probability of a magnitude 6.0 to 6.9 event somewhere in the Canterbury aftershock zone over the next 12 months …" was headlined as "*Little change to risk of big quake – expert*" (2011: 49). Subsequent research also shows that people, presumably including officials, faced with a probabilistic forecast will put off decisions resulting in failure to act or prepare (McClure et al. 2015)**.**

4. THE *EMON* IN COMPLEX EMERGENCIES: CIVIL-MILITARY COOPERATION

Dissatisfaction with the command and control model of crisis management seems to be an ongoing and unifying feature of researchers (Buck et al. 2006; Alexander 2008; Moynihan 2009; Grint 2010; Scholterns et al. 2014; Jensen & Waugh 2014; and Owen et al. 2015) and yet it persists. The juxtaposition of the military alongside civil NGOs and international agencies, known as Civil-Military Cooperation (UN OCHA), in complex emergencies (see Chapter II) presents a significant challenge which I shall use as an exemplar of the tensions created by flattening the crisis leadership structures.

The challenge for the military which conventionally operates in a rigidly vertical structure is to fit in with the horizontal civilian structures of the NGOs and what there is of the host nation, whilst under constant media scrutiny (Hornburg 2013). Based on their experience of peace keeping operations Burkle and Hayden (2001) listed the characteristics of both vertical and horizontal organisations (Table 6) and summarised the inter-organisational tension as "frequently marked by competition, rivalry for public attention and resources, disrupted communications, differing priorities, differential leadership styles, cultural differences, inconsistent procedures, and contradictory observations, all of which generate delays in response". Given the importance of information they go on "this is most evident when vertically structured civilian or military organisations either are reluctant or unable to share the proprietary information and intelligence property that is critical to the coordination process" (p88).

Table 6: Characteristics of crisis management structures (after Burkle & Hayden 2001)

Vertical or hierarchical	Horizontal or lateral
Defined by an organisational chart	Flat, not dependent on such charts
Hierarchical with authority concentrated at the top, centralised and independent	Distributed decentralised authority, friendly model for multi-agency collaboration
'Stove pipe' information sharing with predictable lines of internal communication	Functionally dependent on information sharing
Limited capacity to change	Requires flexibility in thought and action
Training is standardised	Requires education, training and exercises
Difficulties in dealing with new issues	Responsive to rapid change
Command and control model	Collaboration and cooperation

The overlaps and conflicts such as those between NGOs, private military contractors and military in Figure 5 are perhaps extreme but can be seen in the relationships between all organisations responding to crisis.

Figure 5: Civil-military coordination in Complex Emergencies (Hornburg 2013)
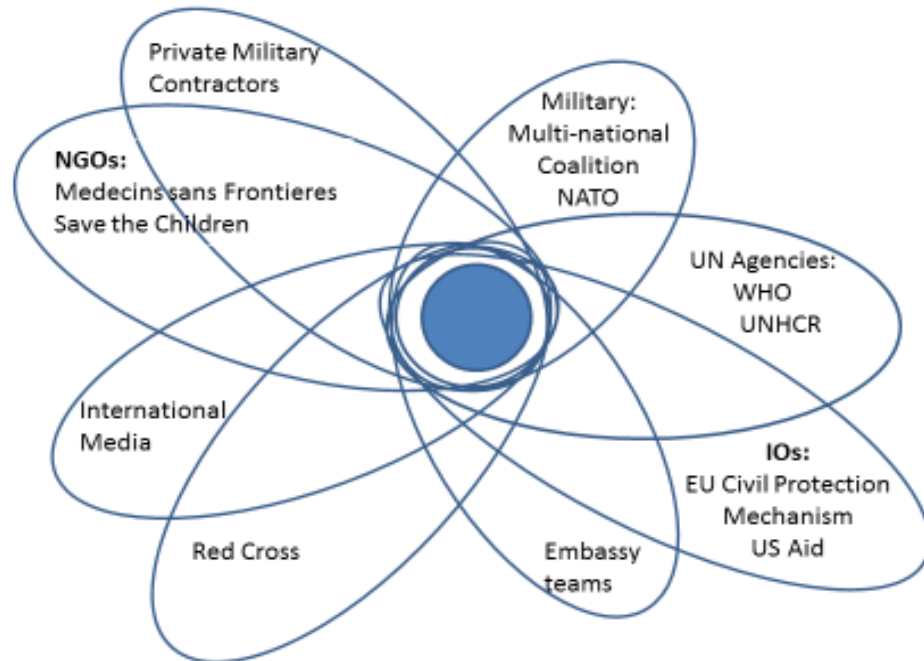
NATO (2013) guidance describes civilian organisations and their "different agendas, structures and procedures" suggesting that understanding their motivation "enables military personnel to minimise friction when interacting with civil actors" (6-1). It also warns against thinking that the civil organisations including police are homogenous, as they vary in "capability, doctrine, procedures, and understanding" and "widely in mandate, outlook, and degree of integration into the coordination system" (para 6-6) with language and terminology that "can cause misunderstanding and create loss of efficiency" (para 6-9). The language of the above insight helps to bridge the Civil-Military divide and compares favourably with the procedural approach of the *Oslo Guidelines,* last revised in 2007 (UN OCHA 2007), or the more recent Aide Memoire (UN OCHA 2014).

5. CONCLUSION: EMERGENT CRISIS LEADERSHIP

In the previous chapter I introduced the organisational typologies of crisis management focussing on *established* organisations (Dynes 1970). In this chapter I have explored the emergence of crisis networks or EMONs (Drabek 1987), such as the civil-military

networks that are now common in crisis and the importance of scientific advice. We can determine two divisions in crisis leadership that are linked to their parent organisations: the *regular*, where the role can be anticipated and therefore justify investment in time, resources, education and training, and the leadership associated with the *non-regular expanding, extending*, and *emergent* groups of the DRC typology (Dynes 1970). I label this latter division *emergent crisis leadership* (ECL)*,* where leadership emerges from the context or situation and where the role is unplanned and unprecedented. It can arise from the grass roots of communities, including online and social media groups, or it can be within an organisation or born of networking and multi-agency coordination. The characteristics are summarised and compared in Table 7.

Table 7: Comparison of crisis leadership characteristics

Regular Established Crisis Leadership	Emergent Crisis Leadership
Organisational role identity	Emerges for the occasion and retreats
Accountable (to judicial process, public opinion and career sanctions)	Less accountable, often to a professional discipline/civic duty.
Explicit leadership skills	Tacit leadership skills
Powerful status, either appointed or elected	Without strong organisational status
Originates from the parent organisation, and/or formal pre-planned agreements	May be family, community, intra- or inter- organisational origin
Altruistic (policy)	Altruistic (personal)
System activated	Self (or peer) activated
Avoidance strategies	Reluctant
Ignores gaps	Fills a gap or need
Management expertise	Esoteric knowledge / skills/expertise
Command and control	Collaboration and cooperation

Perhaps there is something to be learned from Google about emergent leadership. In an interview, their Human Resources director considered leadership, especially emergent leadership, as second only to intelligence in their recruitment criteria

"What we care about is, when faced with a problem and you're a member of a team, do you, at the appropriate time, step in and lead? And just as critically, do you step back and stop leading, do you let someone else? Because what's critical to be an effective leader in this environment is you have to be willing to relinquish power" (Bryant 2014).

This observation is equally applicable to the relationships between established organisations and the networks of organisations that extend their normal roles as well as the community groups that emerge in response to crises. I shall use the organisational characteristics of emergent crisis leadership summarised in Table 7 in my case study of the response in New Orleans to Hurricane Katrina in 2005. That event represents the potential scale of future crises and my aim is to explore what form crisis leadership might take and then what pedagogy might be appropriate.

CHAPTER VII. RESEARCH METHODOLOGY

1. INTRODUCTION: THE PROBLEM

I contend that there is a convergence of issues that will affect the skills and knowledge needed by individuals faced with crisis (Barnett 2004; Lagadec 2009a), the most important of which are:

- the context of the future global existential threats to mankind and the *novel crises* (see Chapter IV) they will initiate (UN IPCC 2012; UN ISDR 2015), and

- the challenges this creates for crisis management systems and leadership across a wider range of organisations and other professional actors than hitherto (Auerswald et al 2006) (see Chapters V & VI), and where

- education to support higher-level problem solving and decision-making skills (Comfort & Wukich 2013) may be affected by the changes to the funding and delivery of Higher Education in the UK (Hubble & Foster 2017). The sector is already adjusting to other influences including changes to student profiles (Andres & Carpenter 1997), part-time vocational students and employment patterns (King 2008; HE Commission 2012), and the impact of austerity policies (Hillman 2015) globalisation and competition (Fielden & Middlehurst 2016).

Relevant HE programmes are relatively rare and largely focus on those public and corporate officials employed in planning for emergencies or business disruptions, i.e. foreseeable events, who can reasonably expect to use their knowledge of the systems and resources in their careers. However, even their education and development is threatened by removal of sponsorship and investment with questions about the fit-for-purpose of the curriculum.

The situation is not helped by the confusion regarding the understanding of basic definitions around crisis (Laakso & Palomaki 2013) and the lack of an established academic discipline for crisis (Jensen 2012; Lalonde & Roux-Dufort 2013). Contemporary crisis research is summed up by James et al. (2012) as a "myriad of disciplinary approaches" including political science, management, and public administration, with diverse niche journals resulting in fragmentation that "has kept

crisis research on the periphery of mainstream management theory" (p457). To these disciplines we must add those that are concerned with the *context* of crisis (see Chapter II) including disasters, public health, engineering, built environment, and meteorology, with the difficulty of interaction between researchers and "limited use of one another's knowledge products" (Tranfield & Starkey 1998 in Buchanan & Denyer 2012:207) and the lack of integration (Boin 2005). Whatever the challenges, this diversity reflects the multi-discipline and multi-organisational response that may be required to respond to future novel crises.

2. CRISIS RESEARCH: CHALLENGES AND ETHICAL ISSUES

2.1. Background to Crisis Research

Ironically the stimulus for the Post-War disaster research was as much to do with Robert Burns' *man's inhumanity to man* as it was to Acts of God or technological failures. A study of the effects of aerial bombing on enemy cities (US Strategic Bombing Survey 1947) may be the origin of the pervasive myth of mass panic, noted by Baker & Chapman (1962: 12) which continues to feature in both the literature and the media (Alexander 2007; Clark 2008; Fischer 2008; Drury, Novelli & Stott 2013). Janis (1951: 29 in Barton 1962: 235) quotes from the report "Pandemonium reigned as the uninjured and slightly injured fled the city in fearful panic" referring to Hiroshima but when he examined the data he found to the contrary that "In general a sizeable proportion of the Hiroshima interviewees (over one third) referred to rational, practical actions carried out in order to assist other people" (p236), that is pro-social behaviour.

The issue of whether disaster research was just a perspective of sociological research has been a concern for some time with Killian (1956) making the point that although some types of research related to disasters presented no unusual methodological problems "It is in the analysis of significant psychological and sociological variables as they affect human behaviour during the course and the immediate aftermath of a disaster that special methodological problems arise" (p3) among them ethical considerations which will be dealt with in detail later.   The practical aspects were reinforced by Cisin and Clark's (1962) assertion that there were no special methods unique to disaster research but "its methods are the methods of social research" (p23) and again by Mileti (1987) that "from a methodological viewpoint disaster research is hardly distinguishable from the general sociological enterprise" (p69). This debate

persisted with Stallings (2002) conceding that otherwise competent researchers "will find the study of disasters is different" from qualitative or survey research, that difference being circumstance and context (p21).

Killian (1956) highlighted the early but continuing issues of disaster and crisis research

> "There is no area of social research in which the scientist must operate with less freedom than in the field of disaster study. Controlled experiments, except with small-scale, simulated models, are forbidden him. Since disasters are highly unpredictable, he rarely has the opportunity to select the locus of his study before the disaster has occurred ... Insistence on the control of a large number of variables may lead to no research at all" (in Stallings 2002: 53).

2.2. Primary Data: Crisis Field Research

Although the considerable ethical and logistical difficulties in carrying out field research mean such studies are rare, with appropriate resources, support and pre-planning researchers can be mobilised for selected events. Notable examples are studies undertaken by the University of Delaware Disaster Research Centre and the Quick Response Grant Program of the University of Colorado's multidisciplinary Natural Hazards Center (Quarantelli 1982; 2002). However, crises are often ephemeral and hindsight plays a large part in identifying their gestation.

The realisation that data may no longer be available if conventional research proposal procedures are followed has led to the concept of perishable information and in turn to a special version of disaster field research, quick response research for which the 9/11 terrorist attacks were the stimulus (Michaels 2003). They presented both a need and an opportunity, an example being the 9/11 field work by Kendra & Wachtendorf (2003) which they described as an exploratory case study. Again, context is all important, thus quick response research becomes about "understanding the meaning of exceptional events or daily events in exceptional circumstances from the perception of those being studied" (Michaels 2003:21) capturing data that would otherwise be lost.

2.3. Ethics and Primary Crisis Research

Ethics present a significant challenge to crisis research despite the assertion by Stallings (2002) that "it is the context of research not the methods of research that makes

disaster research unique" (p2). I inadvertently became aware of the ethical issues in research during a review of police maritime search and rescue and the use of data from Nazi medical experiments. Decisions about the likelihood of survival of casualties rely on data obtained under "the shadow" (Ferreira et al. 2015: 31) of such experiments and its use was passionately debated (Cohen 1988; Schafer 1986; and Angell 1990) until the adoption of the 1964 Helsinki Declaration (World Medical Association 2013). This is an extreme example but crisis management has serious life-changing and organisational consequences.

The ethical standards for disaster research are highlighted in an editorial by Stratton (2012) quoting selected principles of the Helsinki Declaration including that the community affected should benefit from the research. In addition, "Every precaution must be taken to protect the privacy of research subjects and confidentiality of their personal information and to minimise the impact of the study on their physical, mental and social integrity" (Editorial). The above principles have practical issues such as gaining timely ethics approval and guaranteeing privacy and confidentiality and whilst the research may greatly benefit mankind, the benefit to a local population is less clear. Almost in parallel to the above, the US National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1979) published the Belmont Report. The principles of the Helsinki Declaration and the Belmont Report have been combined into guidelines for social research of vulnerable people and communities in disaster by Ferreira et al. (2015), augmenting the earlier post-Katrina work of Richardson et al. (2009).

Any focus on leadership and decision-making is likely to have profound mental health and social consequences for those concerned given that a characteristic of crisis is the long-term consequences (Boin 2008). Crises can at best lead to much soul searching, however frequently individuals have been publicly castigated which is why post event interviews with practitioners are an ethical challenge. For instance, at the time of the 1988 Piper Alpha oil rig disaster which killed 165 men, the Offshore Installation Manager's role was production not leadership. Yet his lack of leadership was exposed in the public inquiry "...in my view the death toll of those who died in the accommodation was substantially greater than it would have been if such initiative had been taken" (Lord Cullen 1990: para 8.35). Although there are protections under

international law of functional immunity (ratione materiae) for those holding high public office, there is little protection for others (Franey 2009).

The vulnerability of officials and private sector managers who might otherwise be research subjects or interviewees is demonstrated by the pre-trial legal doctrines of discovery or search for information, and disclosure, where all information must be shared among parties to proceedings (Attorney General 2013). The search for information is thorough and relevance can be liberally interpreted, for instance a search would reveal research reports, potentially leading to requests for source materials such as interview transcripts. Tierney (2002) writing about the changes that had taken place in disaster research in the past fifty years noted the impact of litigation. Hitherto, interviewees could be assured of confidentiality and anonymity but McNabb (1995) highlighted the intrusive nature of discovery:

> "I engaged an attorney and learned that a comprehensive response would mean that I would deliver everything I had written since 1980; every source I had consulted since 1980 which meant virtually my entire personal library and all files, and an equivalent volume of paper and books from other archives and libraries; and financial records, including IRS returns, invoices, telephone bills, and assorted receipts since 1980 …" (p332 in Tierney 2002:357).

I have explored the ethics of crisis research at some length because, as well as the impact on individuals' wellbeing, I have seen from my contingency planning expert witness practice how extensive discovery, i.e. the wide-ranging collection of materials in litigation, can be. In our adversarial legal system, all parties trawl for any evidence, however tenuous, of organisational or personal negligence, so that the researcher becomes an "unwilling informant" (Picou 1996: 149). This has persuaded me to rely on secondary data that is already in the public domain albeit from diverse sources.

2.4. Secondary Data

Literature Review

Literature review is a major thread in my project and a dynamic process where the perspectives of the many disciplines were viewed through the lens of my own practice. Not only do I seek to build a sound foundation for my research (Hart 1998) but the literature review has greatly influenced my thinking and the direction of my study, for

instance the concept of crisis paradigms after Kuhn's paradigms in natural science, the focus on emergent leadership, and the widespread confusion over terminology. The latter and the importance of the literature in educational research are underlined by Boote and Beile (2005) describing how in sharing educational research across diverse disciplines and with policy makers "…it is very difficult for us to assume shared knowledge, methodologies, or even commonly agreed-upon problems" (p4). This is very apt for crisis given the backgrounds of potential students, their organisational level, and the multi-disciplinary sources of the literature.

The literature is also an important source for my research. Researchers can be caught up in crises as observers or victims and there is some quick response research available (Michaels 2003, Kendra & Wachtendorf 2003), especially in the US into natural disasters (Quarantelli 1982).

Grey Literature

In addition to peer-reviewed literature another source of data is the range of documents that a crisis generates. These can be official reports, correspondence, diaries, emails, photographs, news and investigative journalism, and social media, and as McDonald and Tipton (1993) point out their existence is the result of decisions to first produce the document and then to retain it, subject all the time to editorial policy, errors, distortion and the interests of the originator as well as editors, proprietors, readership, and pending litigation (p188). The most extensive list of document sources in the literature is that of Snook (2000) who made a case study of the friendly fire accidental shootdown of US aircraft over Northern Iraq in an event that lasted only a matter of seconds and included "… flight records, mishap reports, personnel records, military flight plans, oil analysis, medical evaluations …." (pp16-17).

I have made extensive use of grey literature in my research to explore directions that it might take, as examples of policy and practice, and because of its immediacy. I have also based literature searches on signposting by grey literature, usually where the latter has restricted circulation, to find a peer-reviewed substitute.

Other Sources: Journalism and Oral History

There is often convergence at disasters and crisis events of the media followed later by researchers (Stallings 2002:37; Tierney 2002:363). Killian's contention was that "... news

stories are useful, particularly in the early stages of a study, for the general though tentative, description of the disaster" (1956, 2002: 81) but that was written before a 24-hour media with its global reach. Journalism is important in crisis for early situation awareness and particularly for shaping public opinion and is close to the research tool of oral history described by Abrams (2010: 2) as the "conducting and recording [by digital equipment] of interviews with people to elicit information from them about the past". She notes that it is a "cross-over" methodology "engulfed by issues which make it controversial …" (p2) used by different disciplines and practices ranging from war crime investigations to geography (Riley & Harvey 2007). A comparison between the qualities of good investigative journalism and those of academic oral history was made by Felstein (2004) a former journalist (see Table 8) whilst the overlap of investigative journalists and anthropologists' methods, the "knowledge workers", during complex emergencies was explored by Marcus (2010: 362).

Table 8: Journalism and oral history compared (after Feldstein 2004).

Journalism	Oral History
Shared: Background research, interview based, open-ended questions, objectivity, ethics, evidence, establish rapport, perspectives	
Competitive & commercial	Non-profit & collaborative
Adversarial, silence filled	Patient
Evidence retained if it has commercial or legal value.	Evidence retained in entirety

Other issues of oral history are raised by Stein and Preuss (2006) including urgency in collecting evidence to avoid distortion by what a witness has heard from others rather than seen themselves, the researcher's responsibility often at the "intersection of grief and history" (p40), and the need for objectivity because "the voices of those … silenced by the dominant historiography" (p39) can be exploited for political or financial gain. Buchanan & Denyer (2012) consider that crisis research relies on "designs and methods considered unconventional in other areas" (p206) using "data from sources normally considered unreliable and biased" such as oral history, journalism and grey literature and where the "qualitative paradigm is dominant" (p216). This is fair comment and,

because I rely considerably on such sources in the case study, I have included an annotated bibliography (Appendix D) to assist the reader to judge evidential value against bias in the narratives.

The experience and performance of the strategic leadership and of the established organisations are available for many crises, albeit often in post event judicial inquiries, but little data is available about the effects of their decisions on the experience and perception of ordinary people caught up in the crisis. Oral history assists in this, whilst journalism can stimulate reaction and provide Michael's (2003) perishable data for later analysis.

2.5. Case Study Method

Whilst deliberating about disaster research methods as outlined earlier, Stallings (2002) decided that what makes disaster research unique is "the circumstances in which otherwise conventional methods are employed" that is the "context of research not the method" (p21). He goes further to consider the phase of the disaster being studied concluding that the immediate disaster context, as opposed to the lead up, has a greater effect on the collection and analysis of primary data and that researchers need training in how the circumstances of disaster affect the method. The most influential of these is ethics but as Dynes and Drabek (1994) put it "… disasters represent unique laboratories, ethically acceptable natural experiments. If viewed in this way, disasters are unique social experiments …" (p7).

Case studies have always been a major tool in crisis research and can be traced back to Titmuss's (1950) study of the British civilian population in World War II, and Nagai's (1951) study of Nagasaki. This tradition has continued, greatly helped by adversarial politics, e.g. public inquiries, and investigative journalism.

Perhaps one reason for the popularity of case studies with crisis researchers and in keeping with the phronetic research approach (Flyvbjerg 2001; Tracy 2013) is that if research is to be used it must considered from the perspective of the user (Ruddin 2006). The advantage of the case study is that it is bounded unlike the wicked problems (Rittel & Webber 1973) of professional experience. Lincoln and Guba (2005:205) suggest that the pragmatic appeal of the case study to the user is that the reader can relate their own knowledge and experience to it, and later pose the hypothetical question that a politician or decision-maker might ask "Are these findings sufficiently

authentic ... that I may trust myself in acting on their implications? More to the point, would I feel sufficiently secure about these findings to construct social policy or legislation based on them?" (in Tracy 2010: 837). These are significant considerations if research products are to be useful to policy development (Start & Hovland 2004) and one reason I chose a case study for my research.

3. MY RESEARCH PROJECT

3.1. The Literature Review Process

My approach to researching crisis and *emergent crisis leadership* follows the pragmatic paradigm (Mackenzie & Knipe 2006) in that methods are matched to the problem which appeared to be a convergence of inter-related issues, the "mess" of Ackoff (1979) and Mitroff et al. (2004). I quote from Flyvbjerg (2001) that my aim is to "clarify and deliberate about the problems and risks we face and to outline how things may be done differently …" (p140).

Flyvbjerg (2006) adapted the classical philosophical concept of *phronesis* or practical wisdom into a research methodology for social scientists and professionals, the "analysts who produce food for thought for the ongoing process of public deliberation, anticipation, and decision making" addressing real-world problems (p39). There is a strong connection to the use of case studies (Flyvbjerg et al. 2012) which play an important part in crisis research (Helsloot et al 2012) and education.

Phronetic research "that focuses on self-reflexivity, context, and thick description" is championed by Tracy (2013:4) with whom I empathise, not least her description of her qualitative research based on Lindlof and Taylor (2011) as "cyclical and layered rather than deductive and linear" with a view to an analysis that is "interesting, practically important, and theoretically significant" (Tracy 2007:108). This cogently describes the iterative process I used because of the multi-disciplinary nature of my sources and the confusion reigning over basic concepts.

Originally my project was the professionalisation of emergency management by educating reflective practitioners (Schon 1991). This led to exploring incident command (Grint 2005), and Naturalistic Decision Making (Zsambok et al. 1992; Flin 1996), coupled with Ericsson's (2005; 2008) ideas on expertise and the collective achievements of High Reliability Organisations (Roberts & LaPorte 1989; Roberts 1990).

I first carried out a scoping study of the literature, made difficult by the many disciplines with a peripheral and recent interest in crisis and their diverse concepts and keywords (Jensen 2016: ii). This coincided with the post-9/11 explosion of public and academic interest demonstrated by Crandall et al.'s (2006) bibliometric study (Figure6).

Figure 6: Crisis publications 1980-2006 (Crandall, Crandall & Ashraf 2006: 241)
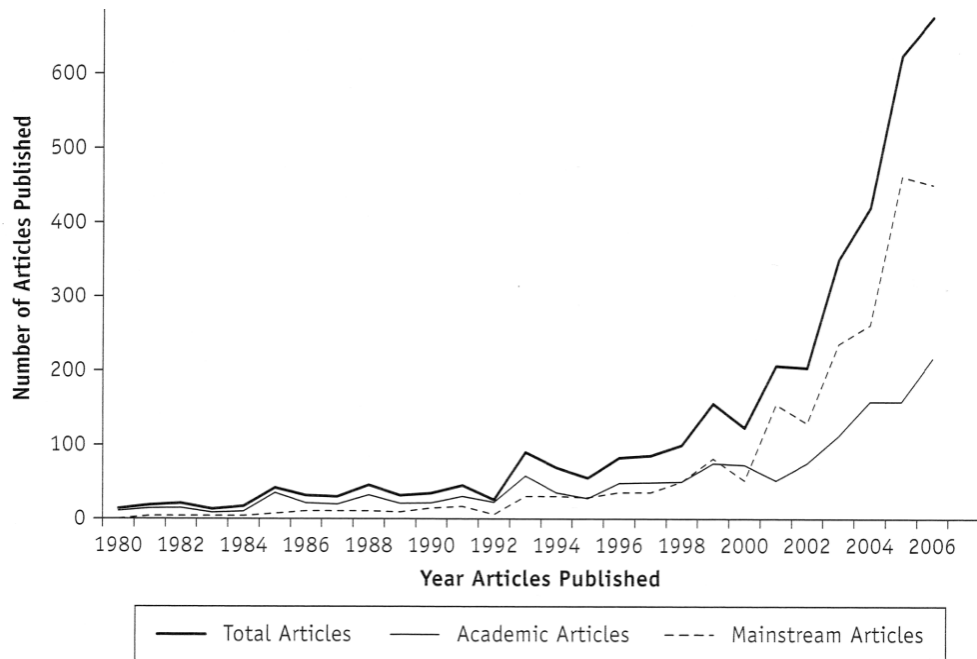
Subsequent rounds of the review were based on ideas thus collected, and repeating the process in an exaggerated version of Saunders et al's (2011: 60) literature review, effectively a personalised spiral curriculum after Jerome Bruner (Johnson 2012). It showed how dynamic and new the field was and I could plot the literature against stages in my career which assisted in developing the idea of crisis paradigms.

Early in my project I carried out a pilot study of the London Bombings of July 2005. This shifted my thinking about crisis leadership. Discussion with informants and reflecting on my own experience led me away from the post holder leader towards a focus on the informal networks that arise in a crisis (Dynes 1970; Majchrzak et al. 2007) and the individuals that emerge as leaders for the occasion (Drury et al. 2009; Cocking (2013). The pilot study also led me to reflect on the importance of the *crisis context* (see Chapter II) so that for my case study of a novel crisis I looked for a large 'landscape' event (Leonard & Howitt 2012) which would challenge the established response systems and the multi-organisational network that might emerge.

4. THE CASE: HURRICANE KATRINA 2005, A NOVEL CRISIS

Previous chapters have raised issues of scale and definition of crisis, the paradigm shift towards the future novel crisis, and examined the leadership models appropriate for this new paradigm. The chosen case represents these converging drivers. The parameters of the case are temporal and spatial (Yin 1994) and fit the criteria of being important, exploratory or exceptional (Yin 2009 and Pan & Tan 2011).

4.1. The *Crisis Context*

On 29 August 2005 Hurricane Katrina, which had already caused damage and disruption in the Caribbean and Florida, came ashore on the Gulf coast of Louisiana and Alabama east of the coastal city of New Orleans and tracked inland across the central United States before dissipating in the Great Lakes. The levees failed and the city was flooded. As a conservative estimate 1,800 people were killed from a population of 485,000 and over 200,000 evacuated, many never to return creating a diaspora as far as Alaska (Dynes & Rodriquez 2007). The catastrophe was only part of the crisis (Boin et al. 2010; Milasinovic & Kesetovic 2008; Shaluf et al. 2003). There was failure to appreciate how serious the situation was and to act on warnings, a history of environmental degradation, inadequate or failed engineering solutions, poverty, racial inequality, inept public administration, system failure, poor federal and state leadership, and apathy (Daniels et al. 2006; GAO 2006a, 2006b; DHS 2006), including Bohn's (2004) venal factors of corruption and misfeasance, witnessed live by a global audience.

4.2. Katrina as an Opportunity

In terms of being exploratory (Yin 2009), I see Katrina as a mesocosm of a future scenario much like the opportunity a coral reef or volcanic island presents to an ecologist. Hurricane Katrina presages the potential for future crises since population centres across the globe share many of the characteristics of New Orleans, be they infrastructure, environment or social (UN Habitat 2010; McGranahan, Balk, & Anderson 2007), including

- pre-existing racial tensions and poverty that mirrors the global North-South inequality (Pastor et al. 2006),
- the consequences of environmental, especially coastal, exploitation and mismanagement (Duxbury & Dickinson 2007; Blackburn & Marques 2013)

- the vulnerability of urban coastal settlements (Jongman et al. 2012; Bruns 2013) including the additional challenges posed by ageing populations (Redlener & Culp 2010; Bruncard et al. 2008),

- Population mobility, in this case both voluntary and forced migration, and the experience of the New Orleans diaspora (Peek & Weber 2012), subsequently studied by the UK Foresight Project as lessons for future climate and conflict refugees (Cutter 2011),

- the vulnerability of the infrastructure e.g. levees (van Heerden 2007),

4.3. Case Sources (Secondary Data)

The landscape scale (Leonard & Howitt 2012) of Hurricane Katrina brought a bonus for research. The area affected by Hurricane Katrina was extensive enough to involve many jurisdictions and institutions. The US freedom of information policy has ensured that there is a wealth of data generated by the responding organisations, including communications traffic, logistics, deployments, and organisational successes and failures, summarised in the official grey literature (US Senate 2006; US Senate Committee on Homeland Security 2006; GAO 2006), the response of the White House (Townsend 2006) and by academics (Ink 2006; Farazmand 2007; Burby 2006).

The poor response engendered a veritable industry of investigative journalism and academic research by leading figures, many of whom had been directly affected by the disaster. Luft (2009) noted that eighteen academic journals had produced special issues on Katrina and the Katrina research bibliography is 112 pages (Erikson & Peek 2011: Erikson 2014). A significant proportion of research has focussed on race and racism and how these underpinned interwoven issues of vulnerability in those who did not or could not evacuate in time. These issues included health, education, class, gender, public services, housing, ageing, and especially poverty that are "the cumulative result of a long history of institutional arrangements" (Hartman & Squires 2006: 3). "And that poverty has roots in a history of racial discrimination" admitted President Bush in a speech in New Orleans two weeks after Katrina (Bush 2005).

An early and depressing analysis of race and poverty with respect to Katrina was provided by Dyson (2006), depressing because the conditions of the urban poor in the US seem to have changed little in the decade since. Although the media played a large part in drawing attention to the crisis, Dyson emphasised the way in which the media

framed negative perceptions about the survivors, most of which turned out to be baseless but may have contributed to the delay in the humanitarian response to New Orleans. Even before landfall the legitimacy of the police as an institution and trust in individual officers (Hawdon 2008) was probably in doubt whilst racism is implicit throughout the narrative in Chapters VIII and IX, for instance in the framing of survivors in the Convention Centre refuge as requiring a military assault rather than rescue (Blum 2005).

Added to this huge database and of interest to this research are the personal accounts given to researchers and journalists (see Appendix D) of those caught up in the crisis who survived including elite decision makers, first responders, and affected citizens and volunteers. Sometimes the latter came from the communities, earning them the label the "Second Line Rescue" (Ancelet et al. 2013) after the non-professional mourners or second line of improvised dancers and singers in New Orleans street funeral processions.

Journalists, usually considered biased and unreliable research sources (Buchanan & Denyer 2012) played an important role in alerting the world to the crisis and the inadequate response (Johnson 2005b) whilst collecting data that was widely relied on in the first wave of research papers and subsequently re-reported. Later oral history interviews added to the available knowledge base including Stein and Preuss (2006), Sloan (2008), and Mann and Pass (2011). Research reached a milestone with the US Social Science Research Council's '*Task Force on Katrina and Rebuilding the Gulf Coast'* (Erikson & Peek 2011; 2014) and is still being published such as the longitudinal study of the displaced New Orleans Diaspora (Angle et al. 2012) and analysis of the reportage of Hurricane Katrina (Potts et al. 2015).

4.4. Limitations of My Research

Crises are by nature unusual events that cannot be replicated and experiments are unacceptable but there are additional limitations to my research:

- **Parameters of the case study:** Due to the scale of the case I set approximate parameters of two weeks during the acute phase of the crisis. However, literature, including oral history, continues to be published about the communities in New Orleans and those evacuated to other cities,

- **The military domain:** Except where it overlaps with mainstream crisis research, such as Hannah et al's (2009) extreme contexts and Burkle & Hayden's (2001) complex humanitarian emergencies, I have avoided literature in the military domain (Kolditz 2007). Here the *warrior ethos* of "Mission First …" (Riccio et al 2004: vii) is still discussed (Casto 2014; Boe 2016) and difficult to reconcile with humanitarian missions and thinking of Reed et al. (2004), Davis et al. (2007), and Markel et al. (2010) on educating future officers.

- **Acknowledgement of bias:** A lifetime of experience will have influenced my choices and direction but as Mikusova (2011) puts it well, crisis research requires "personal engagement", to have empathy with the suffering of those affected by crisis, be it a natural disaster or malfeasance, not a "scientist as an impartial observer" (p982),

- **Multi-discipline literature review:** Whilst I have strived to include the literature from many different disciplines it is inevitable that I have overlooked relevant research. At the same time, I have had to close off promising threads of research to keep to the main thrust. This exposes the project to Quarantelli and Dynes' (1977) early concern that interdisciplinary research is "often reduced to the lowest common denominator, which is sometimes only slightly, if at all, a common-sense level" (p44). More recently practitioners and researchers have made clear the value of a multi-disciplinary approach to studying and managing crises (Wlison 1999; Alpaslan & Mitroff 2011). This sometimes required that I was selective in the material chosen, recontextualising as necessary (Barnett 2006).

- **Research ethics:** I viewed ethics as especially important in studying crisis leadership and it led me in a direction that challenged the rigor of the research. I note that Casto (2014), who was head of the post-Fukushima 2012 US mission to Japan, interviewed many involved in that crisis without appearing to consider ethics whereas Porche (2009) who interviewed staff in a New Orleans hospital soon after Katrina persisted with interviews despite active litigation and obvious distress of interviewees. His ethical justification was that "contact information" for free support was provided (p44). I therefore revisited the specialist

literature on this issue (Picou 1996; Palys & Lowman 2002; O'Mathúna 2010; Bevc 2010; and Robinson 2016) for reassurance that ethics was a necessary limitation and my choice of secondary data was appropriate to the study.

5. SUMMARY

In this chapter I have sought to outline my research strategy, taking a pragmatic problem solving phronetic approach. I noted how the direction of my research changed, and discussed some of the issues and special conditions of crisis and disaster research, emphasising the predominance of the case study as a method in this field.

In the following case study, based on the extensive peer reviewed and grey literature and narratives of those who were intimately involved after Hurricane Katrina struck, I shall use the DRC typology as a framework (Dynes 1970). In Part I (Chapter VIII) the focus is on the established organisations that responded, including the degrading of their capacity. In Part II (Chapter IX) I focus on the expanding, extending and emergent organisational types and their networks. I conclude with the lessons identified in Part 3 (Chapter X).

CHAPTER VIII: CASE STUDY of HURRICANE KATRINA AND NEW ORLEANS 2005: PART 1. THE *NOVEL* CRISIS

> URGENT - WEATHER MESSAGE
>
> NATIONAL WEATHER SERVICE NEW ORLEANS LA
>
> 1011 A.M. CDT SUN AUG 28 2005
>
> DEVESTATING DAMAGE … MOST OF THE AREA WILL BE UNINHABITABLE FOR WEEKS … AT LEAST ONE HALF OF WELL CONSTRUCTED HOMES WILL HAVE ROOF AND WALL FAILURE … MAJORITY OF INDUSTRIAL BUILDINGS WILL BECOME NON-FUNCTIONAL … ALL WOODFRAMED LOW RISING APARTMENT BUILDINGS WILL BE DESTROYED … CONCRETE LOW RISING APARTMENTS WILL SUSTAIN MAJOR DAMAGE … HIGH RISE OFFICE AND APARTMENT BUILDINGS WILL SWAY DANGEROUSLY … ALL WINDOWS WILL BLOW OUT … PERSONS, PETS AND LIVESTOCK EXPOSED TO WINDS WILL FACE CERTAIN DEATH IF STRUCK … POWER OUTAGES WILL LAST WEEKS … WATER SHORTAGES WILL MAKE HUMAN SUFFERING INCREDIBLE BY MODERN STANDARDS … DO NOT VENTURE OUTSIDE!
>
> (Johnson 2006: 18)

1. INTRODUCTION

Reminiscent of a Cold War exercise scenario the above was the stark warning issued to officials and media outlets at 10:11am local time on Sunday 28th August 2005 by the US National Weather Service in New Orleans. It followed minutes after Hurricane Katrina Advisory No. 23 in the same vein but couched in more measured language (National Hurricane Centre 2005).

From when Katrina was designated as a tropical storm that was forming in the Caribbean on 23.8.2005 to when it reached Canada on 31.8.2005 and was spent it "crossed the jurisdictional boundaries of at least nine states, three federal regions, and international borders within the Caribbean and with Mexico and Canada" (Comfort & Hasse 2006: 1) not to mention a myriad of counties, parishes and cities. In other words, a transboundary crisis with all the challenges of coordination that entails (Herman & Dayton 2009; Ansell, Boin & Keller 2010).

A few days after Katrina made landfall General Honore overflew and later wrote that "for years military officials have speculated about what ground zero of a nuclear attack might look like. That's what the Mississippi coast reminded me of that day. The scope of the damage was almost beyond comprehension" (Honore 2009: 96).

1.1. The Structure of the Case Study

The case study is divided into two parts. In this chapter I loosely follow Stern's (2000) structure to describe the context of the crisis, its scale and novelty, albeit as we shall see below the triggering disaster was anticipated. The DRC typology (Dynes 1970) described in Chapter V will be used to explore the forms of organisation and leadership found in Katrina, that is: the *established organisations* of the federal, state and city governments in Part 1; the hybrid *expanding* and *extending* lateral collaborations and networks; and the *emergent* ad hoc community and individual responses in Part 2.

1.2. Background to Katrina

Following the terrorist attacks of 9/11 the Department of Homeland Security was created by merging over twenty separate agencies including the Federal Emergency Management Agency (FEMA). The restructuring and the publication of a lengthy new National Response Plan (NRP) alongside the new National Incident Management System (NIMS) was completed in early 2005 before Katrina. However, it would prove inadequate in every element during the lead up to and response to Hurricane Katrina, a "grand failure" according to Farazmand (2007: 153).

Many claims were made of the plan (US DHS 2005a), none of which were met (Moynihan 2009), with the one exception that it would enable "the incident response to be handled at the lowest possible organisational and jurisdictional level" (Walters & Kettl 2006: 258). Crucially this proved to be through emergent ad hoc community groups and individual survivors rather than the systems of the NIMS or NRP.

To the wider domestic and international public Katrina was symbolised by the appalling situation that developed at the Superdome, reported by the media and referred to later (Bahamonde 2005; Honore 2009). The Superdome was the designated *Last Resort Refuge* "intended to provide best available survival protection for the duration of the hurricane only" for people who were unable to evacuate (State of Louisiana 2000: VI1). The intention was that they would be rescued after the storm passed. Instead the Superdome became the refuge for up to 25,000 people for five days.

1.3. Katrina as a Laboratory

The impact of Hurricane Katrina on the southern states of the US, an area the size of the UK, and the city and environs of New Orleans, situated 100 kilometres from the coast, provides us with an insight that could help us to prepare for future novel crises (see Chapter IV). This is a view that was shared by the RAND organisation which saw in Katrina lessons for responding to future terrorist attacks involving weapons of mass destruction (Davis et al. 2007).

Hurricane Katrina was a disaster, meeting all the criteria of a "serious disruption of the functioning of society" (UN 1992) and with a little imagination, by substituting inter-racial tensions and deprivation for conflict it can also be conceptualised as a *complex humanitarian emergency* (UN IASC 1994; Stein 2001) (see Chapter II). According to Klugman (1999) complex emergencies are accompanied by "other forms of suffering including forced migration, hunger and disease" (p1), all present during and after Katrina. Katrina was also a *NATECH* that is a Natural Hazard Triggering a Technological Disaster with long term health and environmental consequences (Cruz et al. 2004; Steinberg et al. 2008; Picou 2009) although that descriptor seems inadequate.

What I seek to do with this case study is to demonstrate that Katrina was much more than a disaster, complex emergency or NATECH. Katrina was a catastrophe in scale and complexity (Quarantelli 2006), meeting the criteria for a *catastrophic incident* (US DHS 2005a) with "extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions" (p2) and represents a potential *novel crisis* (Leonard & Howitt 2012).

As well as meeting the above criteria New Orleans had characteristics shared with many coastal cities (listed in Chapter VII) namely racial tension and poverty, environmental mismanagement, ageing population, migration, and vulnerable infrastructure. The crisis highlighted

- the lack of effective leadership, both political and professional (US House of Representatives 2006, Bahamonde 2005),
- the tensions invoked with deployment of the military (Morris et al. 2007; Davis et al. 2007; Samaan & Verneuil 2009; Moynihan 2012), and
- the apparent social collapse leading to the emergence of altruism and *ad hoc* organisation (Hicks 2007).

These issues are dealt with in the following sections and because of the wealth of data which continues to emerge, I propose Katrina can be viewed as a crisis laboratory and an opportunity for us to explore a potential future scenario and prepare. This is similar to Birkman et al.'s (2010) "windows of opportunity for change" and new "policy windows" (p239), concepts originally proposed by Kingdom (1995). Policy windows are opened by extreme events such as Katrina when problems, policies and solutions come together and if the political climate is favourable then a window of opportunity presents.   I intend to use this window to support the need for a new crisis curriculum.

1.4. Prescience of Catastrophe

The catastrophe that was Hurricane Katrina was anticipated by environmentalists, scientists, journalists, and officials (Coast 2050 1998; Fischetti 2001; McQuaid & Schleifstein 2002; FEMA 2004; Tidwell 2003; Van Heerden 2006).

Despite this, "overconfidence, insensitivity to repeated warnings, and wishful thinking regarding existing policies, practices, and structures … left the US in general and New Orleans in particular unnecessarily vulnerable to natural disasters" (Parker et al 2009: 216).

In July 2004 three hundred participants from federal, state and parish organisations, including Arkansas and Mississippi, took part in an eight-day table-top exercise (IEM 2004). The scenario for the simulation, known as *Hurricane Pam*, was based on a hurricane with winds of 120mph and 20 inches of rain with storm surges that would overtop the levees and flood New Orleans. As the US Senate Committee on Homeland Security and Governmental Affairs (2006) later summarised

> "In many ways, the hypothetical problems identified in Pam predict with eerie accuracy the all-too-real problems of Katrina: overcrowded shelters undersupplied with food, water, and other essentials; blocked highways with thousands of people trapped in flooded areas; hospitals swamped with victims and running out of fuel for their emergency generators. The list goes on and on" (p4).

The outputs from the exercise were substantial intended by the organisers to be a "living document" and a "valuable tool for future catastrophic planning projects" (IEM 2006). A press release at the end of the exercise promised that "over the next 60 days, we will polish the action plans" (FEMA 2004). Unfortunately, actions were not followed up and lessons were not implemented, a situation summed up by Senator Collins, the

chair of the Senate hearing, as "Pam should have been a wake-up call that could not be ignored. Instead, it seems that a more appropriate name for Pam would have been Cassandra, the mythical prophet who warned of disasters but whom no one really believed" (US Senate Committee on Homeland Security and Governmental Affairs 2006: 4).

If Exercise Pam was not enough warning, in September 2004 Hurricane Ivan, at one point a category 5 storm, was on track for New Orleans but weakened and turned east missing the city. Laska (2004) hypothesised in an essay about the consequences for the city had the hurricane not missed, suggesting that it "had the potential to make the unthinkable a reality" (p6) but her timely warning apparently went unnoticed (Tierney 2008).

In April 2005, shortly before Katrina, a series of high-level counter-terrorism exercises known as TOPOFF III was held in the US. An internal report noted "unresolved issues from previous exercises that continue to affect and inhibit the ability of organizations at all levels to effectively coordinate an integrated response" (US DHS 2005b: 2). Furthermore "… the exercise highlighted, at all levels, a fundamental lack of understanding of the principles and protocols set forth in the NRP and NIMS" (p11).

2. THE RESPONSE OF THE *ESTABLISHED* ORGANISATIONS

The focus of my thesis is on crisis leadership and particularly emergent crisis leadership (see Chapter VI). The purpose in discussing the response of the *established* federal, state, and city organisations, e.g. military, police, prison and health, is to show that despite all the investment, re-structuring, training and education post-9/11 there was systemic failure and personal negligence (Adams & Balfour 2007; Preston 2008; Bateman 2008).

There were extensive investigations of what went wrong in the preparation and response to Katrina. At the political level this included the White House (Townsend 2006), the US Senate (2006), US House of Representatives (2006) and the Government Accounting Office (US GAO 2006). Reports were prepared by Federal departments such as FEMA (US DHS 2006) and the National Guard (2005), and at city level by New Orleans Police Department (Bayard 2005) whilst the performance of the physical infrastructure was examined by a consortium of universities, companies and agencies making up the Interagency Performance Evaluation Task Force (Ink 2006). This was in parallel with the equally extensive academic research effort epitomised by the Social Science Research

Council's task force (Erikson & Peek 2011).   With few exceptions, these investigations share a common theme of delay and failure, usually systemic but sometimes personal.

Strategic leadership

Congress harked back to the 9/11 Commission's finding that lack of imagination was the important failure in that instance and this time concluded that

> "Katrina was primarily a failure of initiative. But there is of course a nexus between the two. Both imagination and initiative – in other words, leadership – require good information and a coordinated process for sharing it. And a willingness to use information – however imperfect or incomplete – to fuel action" (US House of Representatives 2006: 1).

The Senate (2006) was equally frank, believing that "leadership failures needlessly compounded these losses [deaths]".   Their report went on to name Mayor Nagin of New Orleans and Governor Blanco of Louisiana for their part in the failures in the government's response and added that Michael Brown, the Director of FEMA, "lacked the leadership skills that were needed" and that Homeland Security Secretary Chertoff did not convey to his department that "government agencies were expected to think and act proactively in preparing for and responding to Katrina" (p7).

The strategic findings of the White House, Senate, and Congress were analysed by Ink (2006) who found "a public administration case study in failure of gigantic proportions" (p800) and listed: warnings that were not heeded; communications failures; information gaps; lack of coordination; inadequate training; medical shortcomings; lack of shelter; lack of initiative; and public administration failure.

The contribution of the White House to the analysis was seemingly candid, summarising the federal response as "a litany of mistakes, misjudgements, lapses, and absurdities all cascading together, blinding us to what was coming and hobbling any collective effort to respond" (Townsend 2006: x).   There was "disappointment and frustration at the seeming inability of the government…to respond effectively to the crisis" and "emergency plans at all levels of government . . . were put to the test, and came up short" (ibid).   Ink (2006) was impressed that it was "unlike many White House documents that are defensive in tone and content, carefully avoiding admission" (p802) but as Harrald (2012) reminds us the author was President Bush's political appointee as Homeland Security Advisor and hence the report was skilfully crafted to downplay Presidential failures.

Catalogue of failure

A journalist for the New York Times (Lipton 2006) who covered the various hearings highlighted the failings and missed opportunities from the testimony, including:

- The dire warning issued by the National Weather Service, quoted in part at the start of this chapter, did not trigger a reaction appropriate to an impending catastrophe;

- Although the warning was repeated by the director of the National Hurricane Centre by conference call with officials including President Bush and DHS Secretary Michael Chertoff on 28.8.2005 at noon, the consequences did not appear to be fully appreciated. The same day FEMA issued a storm warning that predicted flooding and 1 million people trapped.

- Although 1 million people evacuated ahead of Katrina's landfall a Louisiana official admitted that he had done nothing about the transportation of at-risk populations, an outstanding action from the 'Hurricane Pam' exercise debrief. At a FEMA planning meeting a month before Katrina the transcript shows officials were aware of the danger.

- A Louisiana official turned down an offer of assistance to evacuate medical patients two days before Katrina's landfall. In Louisiana 21 nursing homes were evacuated ahead of Katrina but 36 did not evacuate until afterwards and patients died.

- Hospitals were without power because generators were flooded.

- There was confusion about the levee breaches in that a sole FEMA official in New Orleans photographed a break in a levee on Monday 29.8.2005 at 5.15pm but this information was delayed by several hours.

- An urgent request for supplies was made to FEMA by Mayor Nagin but not met for days or not at all.

- The New Orleans Office of Emergency Preparedness "failed" (Bayard 2006: 3).

- The National Guard which eventually sent 30,000 troops to the area suffered a lack of situational awareness (National Guard 2005), namely that it was a humanitarian emergency and not an insurrection or terrorist attack (Blum 2005).

Personal testimony

A graphic picture was painted by individuals representing the established organisations. Bahamonde was an experienced FEMA official sent to Louisiana on Saturday 27.8.2005 ahead of the hurricane. After the eye had passed he made an overflight next day and saw that in his estimate 80% of New Orleans was flooded and that there was a levee break. He telephoned his findings shortly afterwards to Mike Brown, the head of FEMA, and stayed in New Orleans passing information back to FEMA. On 20.10.2005 he gave his testimony to the Senate Committee on Homeland Security including

> "I am most haunted by what the Superdome became … imagine no toilet facilities for 25,000 people for five days. People were forced to live outside in 95-degree heat because of the smell and conditions inside. Hallways and corridors were used as toilets, trash was everywhere, and amongst it all, children, thousands of them. It was sad, it was inhumane, and it was so wrong" (Bahamonde 2005:8).

This was an image shared by General Honore, another experienced professional, who led the military response to Katrina, and was later minded to say that "one of the most enduring images of New Orleans after Katrina was one of thousands of people at the Superdome standing hip to hip in their own waste without food, water, or sanitary facilities" (2009: 229).

Honore met and worked with many local politicians and officials in his role. A subtler image is provided by him when describing his impression of Governor Blanco of Louisiana "…it was clear that, like [Mayor] Nagin, she was under a great deal of stress and also was a victim of the storm. Victims tend to act and speak like victims and that becomes quite apparent to those who are not victims" (p16).

Another very personal and emotionally chilling account was given by Marcie Roth, now a Director at FEMA. In her testimony to Congress in 2010 she opened with "On the morning of August 29, 2005, I received a call that I will never forget" asking for her intervention concerning a New Orleans resident who was paralyzed from the shoulders down and had been trying to evacuate to the Superdome for three days. She went on "I was on the phone with her that afternoon when she told me, with panic in her voice, 'the water is rushing in' and then her phone went dead. We learned five days later that she had been found in her apartment, dead, floating next to her wheelchair" (Roth 2010: 2).

Rich and emotional descriptions such as those above and in the next chapter are essential to crisis leadership otherwise lessons are ignored and human suffering is lost in officialise, such as the summary by the US House Select Committee that during the crisis "there were lapses in command and control" and that "its impact on unity of command, degraded the relief efforts" (2006: 186).

3. CIVIL-MILITARY COOPERATION

The military response to Katrina was considerable, eventually involving 72,000 personnel from Department of Defense active duty, reserves and the National Guard as well as Private Military Contractors (GAO 2006b).

Although large, the response of the military was delayed. This became apparent quite early on with Bowman et al. (2005) in a briefing to Congress dated 19.9.2005 questioning "whether procedural obstacles, administrative failures, or both delayed the arrival of needed resources" and that considering the military to be the last resort may require "re-examination" (Summary).   The situation awareness of the military was distorted by the media reports that both exposed the plight of the survivors but arguably exaggerated the civil unrest in New Orleans. This may have been behind the chilling statement made to the media by Governor Blanco of Louisiana on 2.9.2005 which only added to this misrepresentation:

> "Three hundred of the Arkansas National Guard have landed in the city of New Orleans. These troops are fresh back from Iraq, well trained, experienced, battle tested, and under my orders to restore order in the streets. They have M-16s and they are locked and loaded. These troops know how to shoot and kill, and are more than willing to do so if necessary. And I expect they will" (ABC News 2005 online)

Tierney and Bevc (2007) wrote about the recasting of the victims of Katrina first as looters and urban rioters and then as enemy insurgents, a dangerous delusion that is evident in the language used in a National Guard briefing below.

National Guard

Three days after Hurricane Katrina made landfall General Blum gave a media briefing about the military action in New Orleans alluding to the "… potentially very dangerous volatile situation in the Convention Centre where tens of thousands of people literally occupied that on their own" (2005:1). The Convention Centre was a very large complex

that became an improvised overflow shelter without staff or resources such as food, water or medical care and although there were reports of crime, dead bodies and gang violence it was not a 'stronghold' i.e. a defended position and there were some police officers present. General Blum continued

> … we waited until we had enough force in place to do an overwhelming force … and yesterday shortly after noon, they <u>stormed</u> the Convention Centre, for lack of a better term, and there was absolutely <u>no opposition</u> … Some people asked why we didn't go in sooner … As soon as we could mass the appropriate force … then they went in and <u>took this convention centre down</u> … It's a great success story, a terrific success story" (ibid) [my emphasis].

General Blum added that the New Orleans Police department at full strength had 1,500 officers but had been degraded by the disaster and were now reinforced by 7,000 military police and other specialist units. He was subsequently decorated by Rumsfeld for the "amazing response of the National Guard following Hurricane Katrina in September 2005" (Smith 2005) but ironically shortly afterwards the National Guard completed its After-Action Review. This made many critical observations about performance, command and control, confusion over legal status, public relations, and ironically situation awareness especially of the national Bureau under General Blum's immediate command (National Guard 2005). One useful lesson to emerge was that in support of the literature (Burkle & Hayden 2001; Lind et al. 2008; Curnin et al. 2015) the report found that "Liaison officers (LNOs) proved invaluable. They assisted coordination efforts by providing situation awareness for the decision makers. LNO use of SATCOM phones during the early stages of response was essential to making and filling resource requests and to providing timely SITREPS to higher headquarters entities" (p59).

Joint Task Force – Katrina

Despite the delay of five days before deployment caused largely by political issues and the Posse Comitatus restrictions on the domestic deployment of the military (Bowman et al. 2005) the build-up of active duty resources in addition to the National Guard was considerable including 20 ships, among them a hospital ship, helicopter carrier and a Marine Amphibious group; 346 helicopters; 68 aircraft; and 72,000 active, reserve and National Guard personnel (US Senate 2006). The number of helicopters may seem significant but it was dwarfed by demand and since there was little coordination many operated independently so that there were overlaps alongside areas with no cover. The

priority of removing survivors to dry ground in short flights unfortunately meant that they waited there for evacuation without food and water for some days (ibid).

On 30.8.2005, the day after Katrina made landfall, the Joint Task Force was established under the command of General Honore, a native of Louisiana, who became the face of the Federal response. On 3.9.2005 the President ordered the deployment of land forces to Louisiana but it was not until four days later that full deployment was completed and troops started search and rescue (US Senate 2006).

In their report on lessons for army planning Davis et al. (2007) deal in detail with the numbers and units deployed as well as the many and complex command and control structures which may have added to the confusion whereas the memoirs of General Honore (2009) provide an insight into the human side. Although loyal to the military and the government, in his account he questions "whether troops coming to a national disaster need rifles? It's harder to lift someone when you are in full combat gear" and adds armed private security guards "with assault rifles and shotguns should not be used to protect property" concluding that "This is America, not Baghdad" (p135).

The use of military assets to perform policing functions within the domestic US is contentious and largely prohibited by the Posse Comitatus Act 1878 for reasons of constitutional freedom, the exceptions being the National Guard and Coast Guard. The advent of the 'War on Terror' concept and the establishment of the Department of Homeland Security and a domestic military regional command after 9/11 led to uncertainty among emergency managers (Milliman et al. 2006; Dunphy & Radel 2009) and debate about the continued efficacy of the restrictions which continues (Doyle & Elsea 2012; Sausville 2008; Gereski & Brown 2010; Bentley 2012; Burke 2015). The same restrictions prevail in the UK where there are strict guidelines for deployment of the military, invariably under police command (MoD 2016).

US Coast Guard

Although the US Coast Guard (USCG) is an armed military force it was incorporated into the new Department of Homeland Security after 9/11. More importantly apart from the US National Weather Service (Johnson 2006) the Coast Guard was the only federal agency that gained any credit in the response to Katrina largely due to its core roles of search and rescue, maritime safety and port security (US Senate 2005). In other words, "the Coast Guard did not do anything out of the ordinary: what was extraordinary was the scale of the event" (Morris et al. 2007: 100).

Amidst all the criticism of the federal government and established organisations the response by the Coast Guard was judged the exception (US GAO 2006c). It is estimated that the Coast Guard rescued 33,735 people stranded by Hurricane Katrina and the floods that followed in New Orleans and the Gulf Coast. Their operational effectiveness in the crisis in contrast to the other agencies has been explained by a combination of factors, including their internal culture of leadership and day to day operational practice, training and organisational learning, small size, and both the physical and social environments in which they work (Phillips 2003; Sanial 2007).

According to the report by the Government Office for Accountability (2006c) which sought to explain the success of the Coast Guard, their operational principles "promote leadership, accountability, and enable personnel to take responsibility and action, based on relevant authorities and guidance" (p1) and played a significant part.

Canney (2010) who had access to official records and interviewed key Coast Guard staff involved in the response to Katrina compiled a detailed history of the Coast Guard's involvement. On receipt of the hurricane warning an advance party was despatched to Alexandria, 150 miles north-west of New Orleans, early on Saturday 27.8.05 to set up a command post away from the anticipated disaster. An incident team was established in New Orleans but all outlying stations and vessels began evacuation to their pre-planned safe havens to wait out the storm. The local maritime industries were contacted and encouraged to implement their own hurricane plans.

The Coast Guard acted immediately on the warning from the National Weather Centre and following their emergency plan ensured the safety of staff and protection of resources, steps that should be expected of any organisation.

As soon as weather conditions permitted USCG helicopters and boats began searching for survivors and lifting them from roofs but at the discretion of their crews and not coordinated. The communications breakdown across the region affected the USCG although it had moved some large cutters into the Gulf to provide some radio cover. In a subsequent interview the air commander defended the lack of coordination with "thousands of simultaneous search and rescue missions there could be no way to micromanage individual aircraft on individual rescue cases" adding that a grid system, such as that used later by the military, was "your secondary effort where you're going through in a bit more methodical approach" (Canney 2010: 184).

The media and politicians were content to take the performance of the USCG at face value but whilst the crisis revealed the human values it also exposed the lack of investment and the outdated and inadequate nature of the aircraft and vessels used in the USCG response (Carafano & Keith 2006). Following the extra duties expected of the USCG after 9/11 an upgrade of resources known as the Deepwater Force Modernisation Programme had begun but stalled. Had this progressed it would have greatly improved communications and coordination as well as doubling the carrying capacity and range of the helicopter fleet (Birkler et al. 2004) with additional rescues and lives saved that can only be speculated about (Carafano & Keith 2006).

4. FIRST RESPONDERS: THE DEGRADING OF ESTABLISHED ORGANISATIONS

The colloquial term *First Responder* has been adopted worldwide meaning the frontline emergency services who are first to respond to an incident. In the US it was defined in the Presidential Directive on Homeland Security as "individuals who in the early stages of an incident are responsible for the protection and preservation of life, property, evidence, and the environment" and widened to include other public services (HSPD-8 2003: 6), similar to UK Category Two Responders (Cabinet Office 2012a).

New Orleans Police Department (NOPD)

Among the first responders that both the local community and wider civil society rely on is the police service which usually has primacy among the emergency services and is the only service that has a continuous proactive presence in communities. Police have a diverse range of functions in disaster including coordination, reconnaissance, situation assessment, lifesaving, keeping order, and preventing crime. Katrina overwhelmed the New Orleans and local police departments so that the essential functions, on which other responders relied, were at best sporadic.

The New Orleans Police department commissioned an internal After-Action report by Captain Bayard (2005) who although head of vice/narcotics commanded the improvised police boat rescues after Katrina. His concluding paragraph said "We failed to communicate … The instructions and plans that are formed at the top are not clearly communicated to the rank and file ... this causes confusion and misdirection. In time of crisis, our leaders need to be SEEN and HEARD" (p4).

Bayard later gave evidence to a Senate hearing and candidly admitted to a catalogue of failures by the New Orleans authorities

> "The New Orleans Office of Emergency Preparedness failed. They did not prepare themselves, nor did they manage the city agencies responsible for conducting emergency response to the disaster … We did not coordinate with any state, local or federal agencies … Most importantly, we relocated evacuees to two locations where there was no food, water or portable restrooms … We did not utilize buses that would have allowed us to transport mass quantities of evacuees expeditiously … We did not have a backup communication system. We had no portable radio towers or repeaters that would have enabled us to communicate …" (Bayard 2006: 3).

The context of this litany of failure is that on 29.8.2005 Hurricane Katrina destroyed or damaged much of the critical infrastructure including the public power supply, both cellular and cable telephone systems, internet connection, and some radio towers used by the emergency services. By 30.8.2005 the rising water had led to inundation of precinct buildings and flooding of standby generators that powered the remaining radio towers (Sims 2007). The police department was reliant on the local but now non-functional infrastructure and had no appropriate transport. The officers' terms of employment required them to live within the city of New Orleans and it is estimated that about 80% of officers lost their homes in Katrina and many had to live in cruise ships moored in the port. Some of their families were evacuated, some abandoned their posts, but many were simply stranded.   The NOPD, already poorly led and resourced (see Chapter IX), was effectively a victim of the disaster but many officers who became detached from their normal units formed ad hoc rescue or patrol teams (Hicks 2007).

The experience of the NOPD contrasted with the New Orleans Fire Department (NOFD) which, although it also lost most of its stations, communications, and housing, had a hurricane plan and moved most of its vehicles and equipment to safety before landfall. NOFD crews were aware of the policing problems and provided their own armed cover in the early days (Burke 2006; Cave 2008; Dickinson undated).

Orleans Parish Prison

The city's parish prison, held an estimated 6,375 prisoners, mostly pre-trial unconvicted suspects, the majority for unpaid fines and trial costs. Although the adjoining parish prisons evacuated in advance of the storm the Orleans Parish Prison did not and received additional adult and juvenile prisoners as well as being a refuge for officer's families and residents.

Not only did Orleans Parish Prison fail to evacuate it lacked any emergency plans causing Robbins (2008) to argue that this failure violated prisoners' constitutional and human rights. The American Civil Liberties Union investigated the conditions in the prison and the treatment of prisoners whilst they were held and later dispersed to other sites. After Katrina, they took written statements from 1,300 inmates which revealed appalling and unnecessary conditions as well as abuse before and after Katrina (National Prisons Project 2006, 2007). The accounts of events are confirmed by other interviews of both prisoners, officers, and a prison medical officer.

The Orleans Parish Prison was a large sprawling complex of twelve custody buildings all of which lost power after the storm leaving inmates and staff without light or ventilation. On Monday 29.8.05 the floodwaters rose inside the locked cells on the ground floor to chest height. Doors short-circuited and had to be prised open by staff while some prisoners were forced to break through the walls of the cells to 'escape'. Some guards abandoned their posts leaving prisoners without food or water and in increasingly tense conditions including reports that escaping prisoners were shot by guards. When prisoners were evacuated by boat several days later it was via the Broad Street Overpass where they were marshalled for up to a day in the sun without water, guarded by national guardsmen. The ordeal of the prisoners, most of whom were no serious threat to society, continued, as they were dispersed across Louisiana and many became lost in the system, serving what became known as 'Katrina time' (National Prisons Project 2007). The systemic failure meant that "with few exceptions the prisoners held in OPP in the wake of Katrina took care of one another. They worked to free fellow prisoners trapped in cells filled with contaminated floodwaters, watched out for the frail and sick, as well as for juveniles too small to stand in the water without help" (p90).

The Non-NOPD And Out-Of-State Police Response

As noted above, police are among the first responders to an incident and in many jurisdictions, e.g. UK and Commonwealth, have considerable devolved responsibilities and powers. Rojek & Smith (2007) set out to research the response from non-NOPD police, especially the contrast with the effectiveness of the 600-strong team from Florida which deployed quickly under a state-to-state Emergency Management Assistance Compact (EMAC). This team was largely self-sufficient and drew on a range of units with experience of such mobilisations. In general, Rojek & Smith's findings revealed that pre-Katrina, the Louisiana evacuation plan was effective, but despite the obvious hurricane hazard most small police departments had no disaster planning and had also lost all communications, equipment, fuel, vehicles, and infrastructure. On a positive note, officers worked long days without rest for weeks starting with search and rescue before going on later to deal with post-disaster looting, alcohol abuse, and interpersonal violence.

The researchers not only found a lack of planning but also a "failure to imagine" the effects of a hurricane by local police departments which taken together "severely hampered their ability" to respond (p595). One advance measure should have been to activate the mutual aid arrangements (EMAC) which had existed in the US since 1996 but had not developed inter- agency relationships necessary for the response to a future event (Kapucu & Garayev 2011).

New Orleans Health and Social Care

Alongside the police and prisons in New Orleans another essential service, healthcare, also became a victim of the crisis. Whilst the image of the misery in the Superdome and Convention Centre came to represent Katrina, awful conditions also prevailed in the Memorial Medical Centre which was three feet below sea level. The apparent abandonment of patients and staff by the authorities for a prolonged period after Katrina raised far reaching ethical issues about health care standards and euthanasia in crises (Okie 2008; Larkin 2010) and led to criminal and civil proceedings against medical staff and the hospital owners (Filosa & Pope 2007; Fink 2014; Stevens 2014).

By early Monday 29.8.05 there were 200 patients, 6000 staff and many displaced residents sheltering in the hospital. The city power supply failed so the hospital relied on standby emergency generators. By next day, the hospital was surrounded by flood water and was then without mains power and running water. What followed is

described by the medical director, (Deichmann 2008) and by staff who were interviewed by a medical-journalist (Fink 2009, 2014).

Memorial hospital was owned by Tenet Healthcare who leased the seventh floor to LifeCare which operated as a hospital within a hospital, with 52 long-term and intensive care patients, including seven on ventilators. Anticipating rescue within hours the Tenet medical staff agreed priorities for evacuation, namely neo-natal babies, pregnant mothers and adult intensive care patients. Those patients subject to 'Do not resuscitate' orders were to be left to last, a decision that at the time seemed reasonable but was to lead to controversy when evacuation failed to materialise. The priority patients were evacuated by helicopter from the roof which meant carrying stretchers over four flights to the roof which left about 130 Tenet patients and all the 52 LifeCare patients behind.

At 2am on Wednesday 31.8.05 the generators stopped followed by battery power which affected all medical equipment, e.g. monitors, aspirators, oxygen supply, and ventilators, as well as air-conditioning, lighting etc., requiring continuous manual ventilation for some patients. Patients and staff were not evacuated until Friday 2.9.05 when 45 dead bodies were discovered in the hospital chapel, many showing high levels of morphine on post mortem examination. There was disquiet amongst the medical staff about the care given in the last days and an investigation was started on 13.9.05 resulting in subpoenas for 73 Memorial Hospital employees to appear for interview (Stevens 2014). Dr Pou was arrested for second degree murder in 2006 and appeared before the Grand Jury, her two nurses having been granted immunity in exchange for giving evidence against her (Kaufman 2012).   The Grand Jury found that she had no case to answer (Filosa & Pope 2007) but civil litigation against doctors and their employers continued, eventually being settled out of court some years later (Fink 2014).

The Pou case was brought by the Louisiana Attorney General Charles Foti (2007) who also prosecuted the owners of the single storey St Rita's Nursing Home in an equally high-profile case. The owners, Sal and Mabel Mangano, did not evacuate their patients but prepared to wait out the storm relying on their state-approved contingency plan as before. This time the levees broke and although they were able to float 24 residents to safety on mattresses another 35 residents drowned in their beds or wheelchairs. Rumours of negligence spread and eventually the Manganos were arrested and charged

with 118 counts of cruelty and negligent homicide. They were found innocent of all charges on 7.9.05 (Warren 2007: Cobb 2015).

Both the Pou and Mangano cases exposed hitherto unimagined horrors and another dimension to the failure of the city and federal government response. They also stimulated a yet to be resolved debate about the ethics and priorities of medical care in such crises (Guin et al. 2006; Kipnis 2007; Okie 2008; Iserson et al. 2008; Phillips, Knebel & Johnson 2009; Bernstein 2010; Bailey 2010; Fink 2010).

5. SUMMARY OF PART 1.

 Hurricane Katrina was a natural hazard that led to a disaster when it made landfall in a particularly vulnerable area of the southern USA. The force of the storm meeting the degraded environment, inadequate infrastructure, geomorphology, and socio-economic issues, particularly of New Orleans, meant that the resulting widespread flooding and its impact on public services and infrastructure met both Quarantelli's (2006) criteria and that of the US National Framework (US DHS 2008) for a catastrophe (see Chapter II). As for the response, "… only one thing disintegrated as fast as the earthen levees that were supposed to protect the city, and that was the intergovernmental relationship that is supposed to connect local, state and federal officials before, during and after such a catastrophe" (Walters & Kettl 2006: 255), creating what is termed in this study a *novel crisis*. The scale and severity of Katrina tested the DRC typology especially the boundaries of 'types' as *established* first-responders found themselves divorced from their parent organisations, without communications, transport, bases etc. and effectively became relegated to the status of survivors or victims.

The simulations and computer models had predicted tens of thousands of fatalities (IEM 2004; Laska 2004; Van Heerden 2007), quite believable given the failure to evacuate significant numbers of residents and the inundation of inhabited areas, yet the immediate death toll was estimated to be a maximum 1,800 (Gabe et al. 2005; Sharkey 2007; Dynes & Rodriquez 2007). This prompts the question, why, "what went right?" (Dolina 2005: 2). In the second part of the case study I will look at the functioning of the collaborations and networks that evolved from the *expanding, extending, and emergent* organisations (Dynes 1970), the effects of the catastrophe on the city's first responders and other crucial organisations, and the emergent ad hoc community and individual responses of those left in the city.

CHAPTER IX: CASE STUDY: HURRICANE KATRINA and NEW ORLEANS 2005: PART 2. EMERGENT CRISIS LEADERSHIP

1. INTRODUCTION

In the previous chapter I used the DRC disaster organisation typology (Dynes 1970) as a framework for discussion and began by examining the typology's *established* organisations that responded. I then went on to focus on the Civil-Military Cooperation given its importance generally in complex emergencies and particularly in the response to Hurricane Katrina, before examining the specific examples of in situ police and health care established first responder organisations. In this chapter I will stay with the DRC typology and consider the functioning of the collaborations and networks that evolved from the *expanding* and *extending* organisations. I shall then describe the effects of the catastrophe on some of those organisations and look at the *emergent* responses of those left in the city, looking for signs of initiative and leadership.

In an earlier paper Quarantelli (1987) devised criteria that could be used to assess the disaster preparedness of a society for disaster. Acknowledging that much of the research was focussed on developed nations he nevertheless suggested that the difference in preparedness and response between developed and developing nations was likely to be more apparent at the strategic or "macro" level than the individual citizen or "micro" level with a gradient between them. Thus, in any society, however sophisticated, search and rescue is most immediate and therefore likely to be successful when carried out by survivors, their families and neighbours. Local community organisations mobilise and improvise (Kreps 1992) whereas according to Quarantelli (1987) things could be quite different at the national levels and this became clear in the response to Katrina. He strongly advocated what he called "an emergent resource coordination model" of response commenting that "the exercise of authority [command and control] is more of a problem in the minds of preparedness planners" rather than that experienced by survivors of a disaster (p10).

In chapter VIII I relied greatly on the distillation of testimony given to the four major investigations that scrutinised policy, performance and especially leadership at Quarantelli's (1987) macro levels. In this chapter I will use a range of sources to explore the micro level response and self-help of survivors and those responders who self-deployed. Among them were staff from the established organisations (Dynes 1970)

such as the police, prisons, and hospitals, themselves often victims of the catastrophe, as well as residents and visitors.

2. THE KATRINA *EMERGENT MULTI-ORGANISATIONAL NETWORK* (EMON)

Whatever the failings, the response to Hurricane Katrina provides an insight into the development of an *emergent multi-organisational network* (EMON) (Drabek & McEntire 2002; Majchrzak, Jarvenpa & Hollingshead 2007) and the challenges in response to a catastrophe.   As Garnet and Kouzmin (2007) put it, the failure of the hierarchical command and control systems placed extra emphasis on the emergent network for sharing information and cooperating so that "another of the tragedies of Katrina came when interorganisational networking failed to rise to the occasion" (p180).

Katrina moved the EMON concept from metaphor to something more tangible by the quantity of data collected and the software available to researchers for analysis (Kapucu et al. 2010; Varda et al. 2009).

An early indication of the challenges faced by the responding organisations is provided by Comfort and Hasse (2006) who carried out a content analysis of the local *Times Picayune* newspaper coverage to determine the organisations that responded to Katrina by jurisdiction and sector against their interactions or communication (Table 9). A total of 535 responding organisations was recorded of which the majority, 106, were public and local i.e. county and city.

Table 9. Interaction of Katrina responders (adapted from Comfort & Haase 2006: 6)

Organisations	Public		Nonprofit		Private	
	(N)	**Interaction**	(N)	**Interaction**	(N)	**Interaction**
International	(11)	**2**	(3)	**0**	(6)	**4**
Federal	(69)	**47**	(23)	**12**	(75)	**33**
Regional	(1)	**0**	(7)	**4**	(25)	**14**
State	(78)	**46**	(7)	**2**	(4)	**2**
Parish, county etc.	(80)	**56**	(15)	**10**	(11)	**9**
City	(66)	**50**	(29)	**15**	(22)	**11**
Totals	(305)	**201**	(84)	**43**	(143)	**73**

The destruction of the infrastructure seriously affected the ability of the responding organisations to develop a "common operating picture" (4) whilst Comfort and Haase found only modest interaction across all jurisdictions with federal organisations dealing directly with local agencies and bypassing the state which would negatively affect the situation awareness of the scale of the disaster. Although they analysed the network with specialist software the numbers are nonetheless clear. For instance, despite reorganisation and huge investment after 9/11 at the federal level only 92 of the potential 167 responding agencies had any interaction with others at their level, essential for coordinating the response. As they conclude "given the complexity and cost of managing catastrophic disasters, it is critical to strengthen the capacity for self-organisation at every level of management and operations" (p12).

The coordination of the international response was slow especially given the scale of the crisis. It was described as "role reversal" for the US by Richard 2006 who documented the struggle of agencies to cope with the build-up of international aid. Military cooperation was the most effective because of familiar procedures and previous contact but it is estimated that half of the total foreign aid was not used (Rhinard & Sundelius 2010).

The development of the Katrina EMON within Louisiana was subsequently studied by Comfort et al. (2010) using the situation reports collected by the Louisiana Office of Homeland Security and Emergency Preparedness (LOHSEP) between 27.8.2005 and 19.9.2005. These provided a record of the state-level communication and interactions with parishes, municipalities and the federal government although it was subject to the errors discussed by Butts et al. (2012) below, and caused by the conditions already described. Analysis of the reports revealed serious delays in exchanging information and then responding to requests for services, especially for search and rescue or evacuation. A potential explanation lies with the phenomenon of bottleneck organisations which are those elements of a network that fail to process information efficiently leading to "a domino effect of escalating delay" on the network (Comfort et al. 2010: 51) often of several days. This indicates the value of organisations investing in compatible communications, something that NIMS (Buck et al. 2006) was meant to achieve, and the development of information technology to assist network members which has since received attention in the literature e.g. Cronin & Weingart (2007), Trnka et al. (2009), Janssen et al. (2010), Bharosa et al. (2011), Bui & Sebastian (2011), Arias-Hernandez & Fisher (2014), and Ley et al. (2014).

In analysing why the network failed to coordinate the interorganisational response to the Katrina crisis, Kapucu et al. (2010) noticed a commonality between the fifteen 'lessons learned' in the White House report (Townsend 2006). All involved issues relating to networks but were expressed in terms such as "working with … partners, jointly plan, integration, support, in coordination with, working collaboratively, interagency, and coordinated" (p223). They examined the range of official reports and organisation's daily situation reports (Sitreps) and found 580 organisations involved in the response, including from federal, state, county or parish, municipality, non-profit and private organisations but only 345 out of the 580 coordinated with others. They detected 12 "cliques", or dense network clusters, among organisations but analysis revealed that only nine included FEMA in their networks (p237).

Building on the earlier work of researchers, including Fritz and Mathewson (1957), Tierney and Trainor (2004), Comfort and Haase (2006), and Lind et al. (2008), the Katrina EMON was more recently studied by Butts et al. (2012) who found that a total of 1500 organisations were involved, "over 700 organisations on any given day" with newcomers peaking at 219 on 4.9.2005 (p14). They relied on archival material, especially member organisation's Sitreps between 24.8.2005 and 5.9.2005 to build a graphical representation of the evolving *ex nihilo* network.

Sitreps were used as a substitute for local data collection during the disaster when conditions made fieldwork unsafe. However, there may be blind spots in an organisation's assessment which media reports may reveal so perhaps the most useful picture can be a judicious fusion of the two. A big issue is the drafting of Sitreps to be used by "human writers for use by human readers occupying the same context", that is familiar jargon, tacit assumptions and familiar/shared experience which challenges attempts to digitalise the task (p30).

Another challenge that applies to EMONs is their dynamic nature even over a short time as the Katrina response. Using computational methods of network analysis referred to above, Varda et al. (2009) were able to show this dynamic characteristic in the first few days as, even allowing for errors in the original data, FEMA can be seen to be moving towards the periphery of the network and the American Red Cross towards the centre. Whilst this reflects their respective connections it does not mean that either organisation was any more or less effective. This may have potential if contemporaneous data is available for monitoring the effectiveness of the response and allows some strategic tweaking within the networks.

The slow and ineffective response by FEMA is well documented in the official inquiries, see Chapter VIII, but in accordance with the national plans FEMA opened a Joint Field Office (JFO) or coordination centre in the abandoned Bon Marche shopping mall in Baton Rouge, an unlikely venue but required by the scale of Katrina. Rodriguez et al. (2006) report that an improvised system was working within two weeks of Katrina coming ashore and after one month the JFO had 2,000 staff with the infrastructure to support them. This was an enormous undertaking but, as can be seen from the research cited in Chapter VIII, size did not reflect how it functioned when tested.

The Private Sector

In general, the private sector seems to have acquitted itself well. Louis Armstrong Airport, New Orleans, usually a modest domestic operation, became the centre of air operations for the response. For the first four days it functioned without outside contact but was then host to 30,000 evacuees trying to leave and the arriving military, FEMA, and other organisations, each of which had its own protocols (Guihou et al. 2006). The airport director and his small staff have been singled out for his leadership and their adaptability (Boal 2006) to the considerable demands placed on them. The airport also became host to a Disaster Medical Assistance Team with its medical centre and temporary mortuary. In their 'after-action' report they described a microcosm of the overall chaotic response to Katrina, recorded 3,000 patients but estimated that they treated 8,000 and reported that there was bureaucracy but no effective command and control system (Miller et al. 2005).

The logistical and management performance of Wal-Mart and the company's response to Katrina was studied by Horwitz (2008) who was impressed by their ability to self-mobilise and deliver 2,500 truckloads of vital supplies including prescription drugs, to where they were most needed in the affected areas. This was achieved at the regional level through effective business continuity planning involving senior management, use of satellite telephones, and monitoring the storm, and at the local level by a company culture where store managers had considerable discretion to use their local knowledge and improvise on the spot. Horwitz gives examples of the latter such as the use of one store as a temporary police base and bunk room for police officers made homeless. Another example is emptying a flooded store and giving away undamaged goods to residents as well as pharmacy supplies to a local hospital. As Horwitz noted, for local managers "that sense of empowerment is particularly useful when unusual conditions require agility and improvisation" (p5).

Rodriguez et al. (2006) who were looking for examples of emergent and pro-social behaviour chose the major hotel chains in New Orleans as another example of the initiative shown by the private sector.   Many local residents had historically used the potential 38,000 rooms as vertical evacuation to shelter from hurricanes. Managers decided to stop this practice and thereby encourage residents to leave but in the event despite storm damage the hotels filled with stranded tourists and families of staff. The hotel chains moved resources to New Orleans from out of area unaffected hotels and made their own arrangements to evacuate guests.   Once this was done the hotels became long term living quarters for FEMA staff.

The many government, nonprofit and private organisations that fulfil the large range of objectives and roles within the response to a crisis e.g. the utilities, public health, media, security and so on are themselves often the hub of a network for their own specialism. Thus, the Katrina response network was a "network of networks with overlapping memberships" which made coordination even more difficult and "ripe for errors, poor judgement, and high stress" (Cigler 2007: 71). The picture is further complicated by the reduction of the public sector and privatisation of vital industries such as water and power along with the outsourcing of hitherto state responsibilities. As Simo (2009) observed, the public expect the response to come from government but instead "witness responses primarily from a largely uncoordinated and inconsistent set of nonprofit, faith-based and private actors" (p371). This trend is likely to continue which reinforces the need to prepare organisations "for the possibility that they may be thrust into a coordination role when disaster strikes" (Butts et al. 2012:25). The implications of the above are that education in crisis response needs to be much wider than the professional cadre and perhaps in novel or yet unidentified areas.

3. THE RESPONSE FROM THE AFFECTED COMMUNITY

3.1. Displaced *First Responders*

To capture the voices of the individuals on the ground a team of researchers from the University of Pennsylvania (Fischer et al. 2006) carried out 58 field interviews in autumn 2005 with first responders and confirmed that "the responders were victims as much as the others in their communities" (p4). Their impressions were summed up by one that "when we emerged after the storm passed, we could not see any roads … anywhere … that is when I knew we were really in for it" and another "we had no vehicles to begin

search and rescue … there were no roads to drive on … there was no electricity … we couldn't pump [fuel] "(p4).

The first thing that strikes one from the edited transcripts is that the individuals clearly knew that it was serious but had little idea of the extent except for one who used his generator to power his TV. "All I knew was from the mass media when I turned it on … That is how I eventually knew how big the event was and how long it was taking, and going to take, to get help to all of us" (p8).

Well before the hurricane struck the emergency services were already in action but badly managed so that as another responder noted "To make matters worse, we were already exhausted before impact even occurred … we went into full alert for several days before impact … we emerged in the rubble and then had to begin search and rescue – but we were already exhausted" (p4).

Medical staff reported they had broken into a pharmacy "to acquire needed basic medical supplies since we had no other recourse" adding that "even after we could communicate with officials, they still did not deliver what they promised" (p6). An ambulance crew reported their initial fear of survivors based on a being mobbed which on reflection they realised was because "they saw the ambulance and assumed we would have something they could shoot themselves up with … they were desperate for the drugs they could not now buy since they were cut off from their dealers" (p8).

The social and moral impact on the police was also severe resulting in them experiencing hostility, whether deserved or not (Kemmelmeir et al. 2008) and being reduced to surviving and at best performing as zero responders (Hustmyre 2006). In her analysis of the immediate response phase of Katrina from a criminological perspective Hicks (2007) uses Barton's (1969) typology to explore the environment in which local police had to operate, that of social disorganisation on the one hand and the development of an altruistic community on the other.

Whatever happened after Katrina struck, the New Orleans police were already vulnerable. It had a reputation of corruption, poor education, low morale, bad management and consequently high turnover, low retention, and difficulties with recruitment. They were low-paid, hence many had second jobs, and were policing one of the most violent cities in the USA (Deflem & Sutphin 2009). It was a condition of employment that officers live in the city and so after Katrina passed 300 officers had to be rescued from rooftops and 70% of the force lost their homes. After Katrina 60

officers resigned, 45 were fired, two committed suicide (Anderson & Farber 2006) and eight were eventually charged with crimes related to fatal shootings of civilians by police (Hampton 2016; Associated Press 2016).

Seeking to explain the seemingly irrational inter-group aggression between survivors on the one hand and first responders, usually the police, on the other, during the response to Katrina, Kemmelmeir et al. (2008) draw on a wide range of data from interviews and the media. Their aim was to examine what happened as "by survivors attacking their rescuers, they are rebuffing the very help that they so desperately need. Conversely, when rescuers aggress against survivors, they completely subvert their helping roles and deny the professionalism that is typically found in first responders" (p212).

 Officer Dumas Carter who was one of a small group left to police the Convention Centre gave a long and frank interview to a journalist (Carter 2005) which provides a rich description of the stress they, or at least the interviewee, were under,

> "…police cars destroyed … radios weren't working … people are freaking out … the captain refuses to command us … four of us stayed at the hotel, two of us stayed at the station, and everybody else ran like I don't know what … Lots of people on the street asked me where to go. I'm telling them the truth, which is I don't know". He goes on "Those people went to the Convention Centre, and there was no food or water … there's no police, everybody's left the city except six of us. And there's 20,000 people with no extra security down there … the captain is saying they're going to riot … they're going to burn the fucking hotel down … it's going to be a massacre" (Carter 2005 online in Kemmelmeir et al. 2008: 224).

A more empathetic view was given by another officer at the nearby Superdome, "We are over here, we are outnumbered … we are stranded as well … when they see nothing [help] it becomes a sense of helplessness, and then they tend to of course get hostile … I can pretty much understand why they feel the way they do" (Gordon 2005 in Kemmelmeir et al. 2008).

Despite the abuse of authority and racism, and abandonment of their posts by some officers, others responded to the situation. Many lost everything in the storm whilst others had no knowledge of the whereabouts of their evacuated families. An oral history project has interviewed 24 officers in depth (Cave 2007; Historic New Orleans Collection undated) but the transcripts are sealed for 25 years. Similarly, Kroll-Smith et

al. (2007) were not permitted to record their interviews with their sample of eighteen first responders for political reasons but also themselves felt it was an intrusion. They started with a preconceived idea of the successful first responder as a "bricoleur", in contrast to reliance on protocols and training certificates and found that some people were constrained by plans and procedures whilst others rose to the occasion, re-inventing themselves. As one respondent put it "some people would do the wrong thing the right way [and other people were] committed to doing the right thing any way" (p16) unwittingly paraphrasing Bennis and Nanus (1985: 21) on management and leadership.

Less rigorous accounts are available from a range of sources. One example is a report in *The Nation* that describes a detective who with a diver and a national guardsman went out recovering bodies every night. This was to avoid the heat and media because it was a job that required wearing a hazmat suit. He felt frustrated that "We were under strict orders to remove only bodies but there were still lots of people on the roofs or leaning out of windows. They were crazy with fear and thirst" (Davis & Fontenot 2005: 2).

Writing for a law enforcement readership Hustmyre (2006) gives sympathetic accounts of local police initiatives and improvisation in the aftermath of Katrina. For instance, a SWAT team took their privately-owned boats to work and affected rescues in flooded areas and this was replicated by a group of drug and vice officers. Police commanders, operating without communications or bases commandeered a casino and attempted to coordinate the influx of police volunteers from out-of-state.

Looting became an issue during the aftermath of Katrina (Trainor et al. 2006). There undoubtedly was some looting of luxuries but much of it was best described as acquiring necessities. As one responder put it "We did what we had to do: we prioritised needs … It looked like a third world country around here, I'm afraid we had to act like it, too" (Fischer et al 2006: 5)

3.2. Survivors as *Zero Responders*

The first responder concept was extended by Cocking (2013) to those members of a community already in place, that is survivors or victims who respond and help others, for whom he coined the term *zero responders*. He found evidence from the 2005 London Bombings that among the survivors "figures of influence emerged, who then had a positive effect on the general co-operation to help others" which then allowed "brave individuals to emerge … who can then exert social influence to encourage more

pro-active cooperation amongst survivors" (p10), the emergent crisis leaders. The scale of events, poor decision making and the destruction of infrastructure meant that first responders, both in the formal policy sense and colloquially, were often relegated to the status of victims or at best, zero responders.

Hurricane Katrina as a catastrophe is described in raw terms by survivors, adding to the professional yet emotional testimony of Bahamonde (2005) and Roth (2010) quoted in Chapter VIII. One example is the less articulate interviewee, Bernie Porche, who described the fate of survivors marooned on an overpass waiting for rescue: "… you had dead bodies on the bridge … people from different areas trying to survive the storm … trying to survive this bridge action … she came on the bridge [unidentified police officer], she had a pump [shotgun], she pumped it and looked at everybody, like everybody on the bridge was a suspect, you know, did like a crime or something" (Lindahl 2013: 104).

Many of the survivors that were interviewed in relation to events during and after Katrina were poorly educated and often inarticulate with the interviewers keeping the dialect and slang of the original in their transcripts for authenticity (Vollen & Ying 2008; Ancelet et al. 2013).

A professional account of the aftermath of Katrina is provided by two stranded paramedics who were attending a medical conference in New Orleans and formed part of a group of other delegates, tourists and residents that appeared to be abandoned by the authorities and after several days decided to self-evacuate. Based on their experience they concluded that "the official relief effort was callous, inept and racist. There was more suffering than need be. Lives were lost that did not need to be lost" (Bradshaw & Slonsky 2005:3).

They describe an encounter with local police which vividly illustrated the social breakdown in New Orleans when evacuees tried to cross a bridge to the neighbouring town of Gretna, "As we approached [New Orleans Bridge] armed sheriffs formed a line across the foot of the bridge. Before we were close enough to speak, they began firing their weapons over our heads. This sent the crowd fleeing in various directions" (p2).

Soon after that encounter with police they "decided to build an encampment in the middle of the [elevated] Ponchartrain Expressway" (ibid) for security whilst they waited to be evacuated. They went on to describe their ad hoc emergent organisation

"Our little encampment began to blossom. Someone stole a water delivery truck and brought it to us … an army truck lost a couple of pallets of C-rations [military rations] on a tight turn. We ferried the food back to our camp in shopping carts … cooperation, community and creativity flowered. We organised a clean-up and hung garbage bags ... We made beds from wooden pallets and cardboard. We designated a storm drain as the bathroom and the kids built an elaborate enclosure for privacy out of plastic, broken umbrellas, and other scraps. We even organised a food recycling system where individuals could swap parts of C-rations for applesauce for babies and candies for kids!" (ibid).

This seems a perfect example of emergent organisation and much of it ties in with other stories from survivors.   Their account was published in the left-wing *Socialist Worker* and indicates the authors leanings by opening with reference to "the real heroes and 'sheroes' of the hurricane relief effort: the working class of New Orleans" (p1). Their account was quoted by Freudedburg et al. (2009) in their analysis of Katrina but this left-wing connection may explain why the wider media did not follow-up the story.

These incidents were confirmed in other accounts such as that of a Canadian tourist, Jill Johnson, who was interviewed on radio some weeks later (Burnett 2005), and a similar incident experienced by a USCG rescue boat crew who were threatened twice with a shotgun by an individual police officer when they tried to land evacuees near Louis Armstrong Airport (Canney 2010: 95).

3.3. The Emergent Virtual Community

Several internet sites were created immediately after Katrina listing details of missing persons to match them with persons found safe, something usually done by the authorities, e.g. Casualty Bureau (College of Policing) in the UK and the American Red Cross in the US. It is frustratingly slow and meticulous process because it can involve identifying partial human remains. Within hours of landfall the *Katrinahelp* Wiki was established (Majchrzak et al. 2007) hosted on a student's server in The Netherlands. Information on missing persons, shelters and government resources, children's activities, and employment opportunities, was made available by an "emergent continuously changing set of participants" (p149) according to need and circumstances. Once the site recorded 1 million hits per day the private sector assumed responsibility for hosting it. Informal sites had proved useful after 9/11 and the Asian Tsunami but

using experience gained from the latter a collaboration of individuals, not-for-profit firms, and corporations, in a matter of days developed software, *PeopleFinder*, that could consolidate data to pass to the Red Cross (Jones & Mitnick 2006). Many blogs were created immediately after Katrina, mostly expressing frustration at government inaction, and continued to grow in number mobilising civic participation in the recovery of New Orleans (Ostertag & Ortiz 2015). Perhaps a legacy of Katrina is that similar ephemeral initiatives have now become an important humanitarian resource linking social media to digital mapping (Meier & Munro 2010; Meir 2012) and communities with established responders (Liu & Palen 2010; Herranz et al. 2014) as well as being an active research field (Vos & Sullivan 2014); Hyvärinen et al. 2015).

3.4. The Media as *First Informers*

In Chapter VIII I drew attention to the media's early sensationalised reporting and re-reporting which may have contributed to the delayed response but the media also played an important part in getting journalists to the scene immediately when officials were holding back for safety and logistical reasons, thereby putting pressure on government to step up the response (Miller & Goidel 2009).   One first responder queried "How come emergency organisations could not get there but media organisations could?" (Fischer et al. 2006: 7) something that struck me when I was interviewed live in London from New Orleans by Sky News. May (2006) was the rapporteur at a post-Katrina media conference to explore how the disaster had changed the information landscape. He extended the concept of first responder to his own discipline with *first informers* (ibid) in recognition of the dependency on the media for timely information. The conference observed that digital communication had led to novel ways of passing information "that empowered citizens and created ad hoc distributive information networks" which created a challenging new but double-edged "cadre of first informers" which "exacerbated the pre-existing problems of sorting out truth amid chaos" (pxi). Among the many predictable recommendations concerning the relationship of crisis managers and the media was one relating to the community response, that "alternative and ethnic media and community networks of minority and disadvantaged groups should be tapped" (pxiii).

3.5. Nonprofit Organisations

The nature of Katrina as a catastrophe (Quarantelli 2006) can be seen by the impact on nonprofit organisations that were important to community life before Katrina and might

have had a response role. A survey found there were 3,200 nonprofit community service organisations in Louisiana when Katrina struck (Auer & Lampkin 2006). They built and managed affordable housing as well as providing local health care and supporting the public education system for poorer communities. Most were severely affected by Katrina and later that month by Hurricane Rita, the worst situation being New Orleans where over 54% were non-functioning and the remainder offering limited services. Despite this, faith-based organisations responded immediately with volunteers, churches and premises for temporary shelters, and cash handouts. The same authors report that in another survey "residents rated the response by churches as more effective than those of city, state, and federal governments and local and national nonprofits" (p6). Often themselves victims, the nonprofit and faith-based organisations that survived were effective perhaps "because they were not encumbered by the bureaucracy" (Green et al. 2007:41) and furthermore given the hollowing-out of government agencies (Busch & Givens 2013) such groups could fill the gaps in services both within organisations and as part of a network.

4. INITIATIVE AND EMERGENT LEADERSHIP

For those unfortunate to be left behind in New Orleans and its environs the city might have provided a **"**crucible" (Bennis & Thomas 2002) in which prosocial behaviour and grassroots leadership could emerge but the pre-existing social conditions (Pastor et al. 2006) meant that survival challenged altruism. With hindsight, more could have been done to prepare the people and encourage a self-organised response (Brennan 2007) that could augment the faith-based groups and although it would be limited by the lack of basic transport and communications it could "decrease some of the isolation and sense of abandonment that quickly engulfed victims in the affected areas" (p74).

There are accounts of individuals taking the initiative to greatly extend their community organisations' roles. The Atchafalaya Welcome Center in Butte La Rose was situated on the main evacuation route from New Orleans before Katrina struck and became a rest stop for those eventually evacuated from the Superdome and the Convention Center as well as the aid convoys going to New Orleans. It was originally built to be a community centre for the traditional 'camp-boat' families and the fishing community of the Atchafalaya Basin. The centre coordinator self-mobilised explaining that "Listen my committee is my telephone. I call folks and they respond … all of us know how to spontaneously cooperate … so why do we need a lot of formal leadership?" (Davis &

Fontenot 2005:3).   Gradually the Center became resourced by the authorities but the wider community and local businesses continued to provide traditional dishes including the occasion when 17 school buses of evacuees arrived at once (Donlon & Donlon 2008).

A similar story emerged from Ville Platte, a small town north-west of New Orleans in Evangeline Parish and in the path of Hurricane Katrina, where the director arrived at the Civic Centre to find 6,000 people seeking shelter. She made an appeal via the local radio station for help and the community responded such that the shelter remained open for four months despite the population being among the poorest in the US.   When questioned, she replied "… I may make some decisions that you all may not like, but you all are not here, I am".   She went on "the Ville Platte shelter demonstrated public service in the absence of public policy" (Rego & Garau 2007: 18).   The town also contributed boats to the 'Cajun Navy', the spontaneous convoy of trailered boats that became a citizen flotilla which deployed in the flood waters and it is estimated rescued 4,000 people when "there was no FEMA, just a big bunch of Cajun guys in their boats …" (Davis & Fontenot 2005:1). The full story of the civilian boat rescues is given by Brinkley (2006) with a photo essay in Ancelet et al. (2013).

One aspect of the community response appears to be the presence of some pre-existing skills, knowledge, culture, or community ties that can act as an initiator for Cocking's (2013) "figures of influence" and "brave individuals" (p10), that is potential leaders, to emerge.   There are many such reports of grassroots initiative that supplemented the late or missing government response. Below is a sample:

- A Coast Guard officer in rebuff to the media portrayal of New Orleans told a journalist "… there were plenty of people sacrificing for others regardless of their demographic … We'd go to an apartment building and you would see that someone was in charge, organising the survivors … it happened many times that the guy in charge was the last to leave" (Dolinar 2005: 2).
- Henry Armstrong Jr. interviewed on 5.4.2006 described how he floated his extended family on a mattress in relays from his flooded home to the Claiborne overpass opposite the Superdome "… I just knew that I just had to, I had to, I had to come through … well I knew that they would all be depending on me and I couldn't let them down" (Eugene 2013: 140).

- Carl LeBoeuf and his brother remained behind but persuaded other residents to evacuate by promising to care for their pets (Cooper & Block 2006: 249)

- Benny Rouselle, parish president of Plaquemine Parish in the absence of municipal drivers handed bus keys to groups of relatives to drive themselves to safety "… we sent out 400 buses … where they are today, I don't know" (ibid)

- Father Vien Nguyen, parish priest of the Vietnamese community, persuaded the bankrupt local energy supplier, Entergy, to prioritise restoring power to his area by demonstrating to them the size of his congregation (p250).

- Brobson Lutz, a medical practitioner and volunteer assistant coroner, set up a makeshift clinic with volunteer paramedics from California, collected dead bodies and obtained medical supplies from a looted drugstore now being run by the police drugs squad using their street knowledge of drugs (p255).

- On 30 August 2005 in a more significant move that would leave a strategic legacy a Wal-Mart executive contacted Douglas Doan, an official at the Department for Homeland Security responsible for private sector liaison, complaining that the National Guard were looting stores and giving stock away to survivors. Doan's initiative was to "stop calling this looting and start looking at this as an unusual procurement" (p260) later implemented by many Wal-Mart local managers (Horwitz (2008).

Kapucu et al. (2010) after comparing Katrina with later disasters neatly summarised the scale of the response as: "organising the cooperative effort is almost as difficult as the problems they are created to address" (p240). The importance of the response network and the role of smaller local organisations led them to observe that all organisations have two roles. They must manage across a network of partnerships and collaborations whilst doing much the same within their parent organisation. The latter is predictable and open to conventional selection and development procedures whereas emergent networks require ephemeral altruistic leadership that comes from need coupled with loyalty to the task hence "there is a need to focus on more local level capacity development in response to disasters" (p240).

The DRC typology was used in this and the preceding chapter as a framework to explore crisis leadership during the two weeks of the *acute crisis* (Stern 2000). The learning points from this are brought together in the next chapter.

CHAPTER X: CASE STUDY: HURRICANE KATRINA and NEW ORLEANS 2005: PART 3. CONCLUSIONS

1. INTRODUCTION

The impact of Hurricane Katrina on New Orleans and the Gulf Coast in 2005 was chosen as the case to illustrate a "landscape" scale event (Leonard & Howitt 2012) which would be a challenge for, or even overwhelm, the established response systems and the multi-organisational network that might emerge. Katrina provided the crisis context where environmental destruction, careless industrialisation, poverty, corruption, racism, and a city below sea level was exposed by a natural disaster that modelled the consequences of global environmental change e.g. storm surge and inundation. The authorities were late in recognising the seriousness of the crisis and although the eventual response was considerable it proved inadequate to meet the demands (House of Representatives 2006; Senate 2006; Townsend 2006). Katrina came to represent something different from a large-scale disaster (Lagadec 2008; Leonard & Howitt 2012), arguably the *mega-crisis* of Helsloot et al. (2012) or a *novel crisis* (see Chapter IV).

Use was made of the DRC typology (Dynes 1970) in structuring the previous two chapters with established organisations such as the military and private sector illustrating a shift to *extending* types whilst the absence of the responsible authorities who might have been expected to expand their activities, required emergent organisations and individuals to assume leadership. The EMON (Drabek 1983) "was so large that there was a failure to fully comprehend all of the actors actually involved (partly because of a large voluntary component) the skills they offered, and how to use these capabilities" (Moynihan 2009:2). Over 500 organisations were counted (Comfort & Haase 2006), each of which might have a supporting network, possibly international and virtual, with the risks of overlapping and duplication. At the community level Bier (2006) notes that in the US the resources and planning varies so that "the result is almost literally a patchwork quilt of varying levels of preparedness" (p245).

Comparisons have been made between the characteristics of emergencies and disasters by Auf der Heide (1989), Lagadec (1990:12), Parker (1992:6), and Flin (1996:4), but applying the qualitative criteria of Quarantelli (2000, 2006) rather than gross losses shows that Katrina was not simply a bigger disaster but a catastrophe (Table 10).

Table 10. Comparison of emergencies, disasters, and the catastrophe of Katrina

Emergencies	Disasters	Katrina (Catastrophe)
Interaction with familiar faces	Unfamiliar faces in the response.	Local officials, police, medical staff etc. missing or victims.
Familiar tasks and procedures	Unfamiliar tasks/procedures	No local knowledge or plans proved adequate.
Safe working practices, standard operating procedures and contingency plans.	Attempts to maintain predetermined standards of safe working, personal security, and medical care continue.	Improvisation, including of triage, using the available resources, related to the context.
Local resources and community volunteers respond.	Assistance from neighbouring communities followed by NGOs, private sector, and military/police peace-keepers. Cultural, faith, and language problems.	Neighbouring jurisdictions were impacted. External assistance subjected to lengthy delays. Military became the primary external response with emergency/marshal powers invoked.
Intra-organisation coordination between partner responders.	Inter- and intra-organisational coordination needed	Local emergent and ephemeral organisation interfaces with incoming assistance.
Roads, telephones and facilities intact	Infrastructure may be damaged requiring expensive repairs.	Infrastructure completely or partially destroyed including bases and hospitals. Opportunity to rebuild.
Communication via adequate radio traffic and use of familiar terms	Radio channels overloaded. Different terminology.	No communications infrastructure until established by responders. Information vacuum for surviving community.
Need to deal with local media	National and international media in vast numbers.	Patchy, often misleading, information from international media and social media which contributed to the problems.
Management systems adequate for response and coordination	Surge of responding resources often exceed the capacity of systems	No functioning host systems available to coordinate the responders.

Normal life continues around the emergency.	Return to normality delayed and expensive.	Normal life, either social, economic, or infrastructure, may never be restored.
Political interest is local unless any of the above fail through poor planning, leadership, or resourcing.	National / international interest and personal consequences for politicians.	Unremitting criticism and disgust.

2. LESSONS FROM KATRINA

It might have been expected that Katrina would have yielded many lessons and led to significant restructuring and planning. Harrald (2007) describes three themes for the organisation of the response to a catastrophe based on Katrina:

- The first theme is the conflict between the perceived need for command and control to mobilise and manage a large organisation, a fallacy according to Mendonca et al. (2007), whilst ensuring horizontal coordination and communication (Burkle & Hayden 2001).

- The second theme is that large scale crises present us with unforeseen circumstances and associated complications requiring a need for "adaptation, creativity, and improvisation while demanding efficient and rapid delivery of services under extreme conditions" (Harrald 2007: 257).

- His third theme is the requirement for an inter-operable structure capable of "absorbing and interacting with thousands of spontaneous volunteers and emergent organisations" (ibid).

2.1. Strategy, policy and political theme

The many detailed enquiries into Katrina can be represented by the bipartisan conclusion that "Katrina was a national failure … At every level – individual, corporate, philanthropic, and governmental – we failed to meet the challenge that was Katrina. In this cautionary tale, all the little pigs built houses of straw" (US House 2006: x). The reaction to the widespread criticism of the ineffective response was a revision of the National Response Plan and the National Incident Management System, and the passing of the Post-Katrina Emergency Management Reform Act 2006. The latter kept FEMA

within the Department of Homeland Security but made structural changes to positions of leadership and inaugurated a new emergency management education and training programme (Bea 2007). However, there were still "several dozen political appointees and career senior executives" (p13) and none were required to have any qualifications except for the Administrator who must have "demonstrated ability in and knowledge of emergency management and homeland security; and ... not less than 5 years of executive leadership and management experience in the public or private sector" (p19). Thus, the opportunity to rethink the strategic leadership was missed (Howitt & Leonard 2006; Howitt 2012).

Civil-military cooperation in humanitarian crises is an example of coordination and collaborative leadership but in another missed opportunity new guidance was issued to the National Guard (US DOD 2012) for domestic operations. Despite the decades of experience in humanitarian operations it is couched in military language with aims that include establishing "clearly defined authorities, roles, and relationships" in line with the "commander's intent" and keeping the "battle rhythm discipline" (p4). More promising is the intention to develop a cadre of National Guard commanders "able to operate effectively in interagency, intergovernmental, and nongovernmental environments" (ibid).

2.2. Extreme Conditions Theme: The Exemplar of the Coast Guard (USCG)

The only organisation universally seen to meet expectations was the US Coast Guard (GAO 2006). Although the USCG is a hierarchical military *established* service with a formal architecture it routinely operates as a coordination agency at small incidents and within a wider network, assisted by its leadership culture (Phillips 2003; Canney 2010) including shipmaster's responsibilities (Gold 2003), and statutory responsibilities. Local USCG commanders chair Safety Committees, coordinate the multiagency response to oil pollution, chair local Maritime Security Committees, and work with the river and coastal communities to maintain navigation aids and waterways (Morris et al. 2007).

The altruistic maritime culture of aiding others in distress is now mandated by international law such as the United Nations Convention on the Law of the Sea (1994) and the International Convention for the Safety of Life at Sea (1970). The latter requires all vessels, aircraft, and port authorities to carry identical SAR manuals (IMO/ICAO 2016) ensuring shared international procedures which is where the concept of the *on-scene*

coordinator, the master or aircraft captain at the incident, is found (Jardine-Smith 2015). This maritime culture had already manifested in the evacuation by boat of Manhattan on 9/11, examined in detail by Kendra & Wachtendorf (2016). For USCG crews during Katrina it was "comparable to a rescue at sea … and no other help at hand" (Chaney 2010: 23) and this was spelled out by the master of the USCG *Pamlico,*

> "That's the nice thing about the Coastguard; we don't need to talk a lot … other agencies had problems because they rely so much on command and control. Our culture is a little bit different … so what I was told was hey why don't you go back downriver … I took that as find a mission of opportunity and that's what we did" (USCG 2005: 3).

Admiral Thad Allen of the USCG who was appointed to take overall command of the Katrina response was subsequently interviewed by Canney (2010). Allen listed what he thought were the keys to the USCG successful response as:

- small local bases where staff develop local knowledge and connections;
- multi-tasking e.g. search and rescue, navigation assistance, smuggling and counter-terrorism;
- standardised training which assisted with forming ad hoc crews in the disaster;
- delegation of responsibility to crews so that they continued to function without communications; and especially
- the culture of the "on-scene initiative" policy that encouraged staff to "act quickly and decisively within the scope of their authority, without waiting for direction from higher levels in the chain of command" (USCG 2009:82).

2.3. Volunteers and Emergent Organisations

Many emergent organisations ironically lack organisation, be it hierarchy, leaders, records and communication systems, and are ephemeral and difficult to assign to a typology (Stallings & Quarantelli 1985), and yet as Quarantelli and Dynes (1977) noted "disaster situations tend to be peopled by emergent groups" (p31). The inevitable difficulties facing administrators in the regular organisations of controlling the response to a disaster were itemised by Waugh and Streib (2006):

- "nongovernmental organizations will respond with or without government approval,

- volunteers will arrive with or without an invitation,

- first responders will self-deploy" (p138).

This was the case in Katrina and therefore we need re-conceptualise the response systems to acknowledge this and encourage people to improvise and use their social media as "backchannels" to exchange information (Sutton et al. 2008). Furthermore, we can proactively design ICT tools that can support emergent groups by for instance communicating details of the local situation to officials using familiar technology (Sebastian & Bui 2009) but in a format that could be collated.

Despite the difficulty of coordinating volunteers, a recommendation was made in the post-event Performance Review (US DHS 2006) that a working group should be established "to define the explicit roles and responsibilities for each agency, develop standard operating procedures, and implement a concept of operations plan for response activities that address all levels of disasters" (38). The critical role played by small, local, and adaptable nonprofit organisations and faith-based groups was highlighted by Pipa (2006) who pointed out in response to the above that such organisations "have missions and priorities, manners of working, and capabilities that are not uniform; that many of them might be involved in a disaster for the first time" (p19) and hence make cataloguing difficult.

The DRC typology could be seen in the response of communities and volunteers in Katrina and the same typology has been applied to Australian bush fires (Whittaker et al. 2015).   Volunteers have traditionally carried out tasks without financial remuneration or compulsion (Van Daal 1990) but with "a lifelong and demanding commitment" (Hustinx & Lammertyn 2003: 168) within an organizational context including NGOs. The churches were evident in New Orleans as extending volunteer organisations, providing shelter and food to the survivors beyond the congregations with the pastors playing an important leadership role.

Citizens who "contribute on impulse" and "are not previously affiliated with recognised volunteer agencies" (Cottrell 2010: 3) can be significant, bringing needed skills or resources (McLennan et al. 2016) such as the rescue boats of the Cajun Navy. They

differ from bystanders in that they take the initiative (Burns 2003) to become emergent leaders.

3. IMPLICATIONS FOR TRAINING AND EDUCATION.

Ink (2006) commenting on the direction of the recommendations of the formal inquiries noted that the more comprehensive the plans with scenarios and response systems "the more they are likely to focus the attention of future managers on procedural and jurisdictional issues and less on encouraging initiative and innovation" (p803). He went on to conclude "Experience has demonstrated the need to be able to quickly adapt our response to fit whatever type of threat comes next, not to fit that disaster into complex response systems that were tailored to the last one" (p807). Judging by the continued preoccupation with expanding the curriculum to match all known risks (McCreight 2009; O'Sullivan & Ramsay 2015) his words were not heeded.

In a brief training note for FEMA prepared in October 2005 immediately after Katrina, Blanchard (2005) extended the work on catastrophes by Quarantelli (2000) to discuss where higher education should focus. He saw the challenge for crisis education as one of "overcoming disbelief" and accepting that a catastrophe was "conceivable" (para 1). As he pointed out "decades of social science" have shown that command and control models are "not only inappropriate but counterproductive" (para 8) but still they are dominant. His solution to overcoming disbelief and preparing for such events was twofold: assisting people to visualise situations with technology, and the use of case studies of past and potential catastrophes.

Using the DRC typology (Dynes 1970) Katrina revealed three target groups for crisis leadership preparation: the established organisations, the extending and expanding organisations that contribute to the EMON, and community voluntary groups,

> **Established Crisis Organisations –** Comfort (2007) explained the delay in response by government agencies as a failure of "cognition" (p189) similar to "overcoming disbelief" (Blanchard 2005) above. She saw cognition as the insight or recognition of risk which triggers action, the challenge being "to build the capacity for cognition at multiple levels of organisation" (ibid). The paradox is, that to be effective, organisation structure and flexibility must be balanced. This "varies with size, scope, and severity of the event and the initial conditions of the communities in which disasters occurs" (p193). Not an easy task in

Katrina as Olejarski and Garnett (2010) describe with their label of the "paralytic" officials found in large bureaucracies away from events where careful consideration and not acting without adequate information would be a virtue (p28).

Extending and expanding organisations of the EMON – These organisations may have similar challenges to established organisations with the added issue that they may have yet to experience a crisis and may not yet recognise a responsibility to be prepared. Thus, transferable skills will be important to justify funding for courses. As Katrina revealed "informal organizational elements are needed for agency leaders to feel comfortable in asking for assistance or committing resources to aid another agency or in sharing operational control over joint response efforts" (p597). Planning meetings and courses can assist in this networking.

Community (emergent) organisations – This diverse grouping, outlined in section 2.3. above, proved extremely important in the response to Katrina and has been recognised in the Sendai Framework (UN 2015) and UK resilience planning (Cabinet Office 2016a, 2016b). For such groups, funding for training would come from their charitable status.

In some ways, the division of groups above is artificial. Kapucu et al. (2010) studied the governance of Katrina, where governance is the multiple private sector, non-profit and voluntary organisations that interface with, and increasingly replace, government (Agranoff 2004) and acknowledged, as noted previously, the challenge of "organising the cooperative effort is almost as difficult as the problems they are created to address" (240).   They saw the task ahead as solving those problems "within the cultural, structural, and political boundaries of networks, partnerships, and collaborations while still managing the boundaries of their own home organisation" (ibid). Education opportunities which bring elements of all groups together would seem to be a way of enriching the curriculum and encouraging networking to meet the above aim.

4. CONCLUSION: LESSONS LEARNED – OR NOT.

My justification for choosing Katrina as a case study was that it provided an opportunity to explore a novel crisis and its context so that we might prepare for such future events. Shortly after Hurricanes Katrina and Rita, the UK sent a small team led by the Civil

Contingencies Unit to the US to visit affected sites and interview officials. Their brief report contains fourteen recommendations that have "particular read-across to emergency planning in the UK" (Cabinet Office 2006: 36) but there is little sense that Katrina was a catastrophe, rather a "large scale emergency" (ibid), and no indication of urgent action being taken or of the recommendations being disseminated. The widespread flooding of the UK in 2007 described by Chief Constable Tim Brain "in terms of scale, complexity and duration, this is simply the largest peacetime emergency we've seen" (Pitt 2008: x) was apparently managed without knowledge gained from Katrina.

In 2012 Hurricane Sandy struck the East Coast of the US including New York City. Just as Exercise Pam (IEM 2004) had predicted the vulnerability of the Gulf Coast to Hurricane Katrina so there were warnings of the potential impact of a hurricane on the East Coast. A study by Rosenzweig et al. (2011) warned of damage to the critical infrastructure and inundation by storm surge of low-lying areas and wetlands whilst Abramson and Redlener (2012) quote from a no-longer available evacuation study of New York by the US Army Corps of Engineers in 2011 that "the region's unique and severe vulnerability to storm surge and winds associated with coastal storms cannot be overstated … many residents and businesses while street smart regarding everyday urban issues, are inexperienced in dealing with the direct impacts of a major storm event" (p328).   In the event, 97 people died in Hurricane Sandy, thousands were displaced, and two major hospitals had to be evacuated mid-storm, causing the authors to conclude that "Sandy has been a humbling experience … revealing the same vulnerabilities that the world witnessed in Hurricane Katrina. These include the organisational vulnerabilities of agencies … and emergent groups … and the social vulnerabilities that continue to place isolated and marginalised groups in harm's way" (p329).

The examples above are directly relevant to Katrina but the generic issue of identifying lessons from crises, capturing and disseminating them remains "one of the most underdeveloped aspects of crisis management" (Boin et al 2005: 14).

CHAPTER XI: PREPARING FOR THE NOVEL CRISIS THROUGH LEARNING

1. INTRODUCTION

In this concluding chapter I come to the key issue of how to prepare future crisis leaders, a need endorsed at the turn of the Millennium by Boin & Lagadec (2000) who suggested that based on "theoretical arguments and empirical findings, it seems safe to argue that public managers and corporate leaders are ill-prepared for the challenges that await them" (p185). I will outline a simple solution that adapts the already existing vehicle of the higher education module or CPD Short Course to assist those who find themselves in leadership roles in a crisis. This would be an interdisciplinary addition to the individual's choice of vocational degree programme.

I began in chapter II by discussing the concepts associated with crisis and their definitions. In chapter III. I argued that two paradigms of crisis management could be discerned especially in relation to practice, the *Need-to-Know?* paradigm and the current *Resilience* paradigm. I suggested that global trends and drivers especially environmental change were challenging the current paradigm so that we were looking towards a future *Novel Crisis* paradigm as characterised by Lagadec's (2009) metaphor of *terra incognita* to represent the unknown existential challenges that global trends and environmental change may bring. Whilst crisis is an elusive concept, crisis management has meaning greater than its parts, by its nature including elements of leadership along with management. This led me to explore the nature of crisis leadership in the context of the organisational response to crisis, including the future novel crisis. The impact of Hurricane Katrina on New Orleans in 2005 was chosen as a case study that would help to understand the challenges of the novel crisis, the potential for catastrophe posed by the convergence of social and environmental trends, and the challenge facing crisis leadership. The case study confirmed the emergence of new structures and forms of crisis leadership, which I conceptualise as emergent crisis leadership, that arise when individuals in organisations and communities are "without the strict procedural rules that are usual in organisations" often with "no regulations or defined contracts" (Boehm et al. 2010: 191).

Preparation: the sixth skill of crisis leadership

The five critical skills of crisis leaders against which they might be judged were listed by Boin et al. (2005) as sense making, decision making, coordination, meaning making, that is communicating the issues to the public, and terminating or ending special crisis measures, see chapter V section 3.2. Having reflected on the above, a co-author Stern (2013) later proposed a sixth skill of *preparing*, consisting of several subtasks, notably planning, educating, training, and exercising (p53). The planning relevant to this discussion is not the contingency planning that takes place to meet quantified risks such as that required by the Seveso III Directive (EC 2012) which can only be a snapshot (Perry & Lindell 2003) but "activities to identify capabilities and resources that can be deployed in novel and creative ways" (Stern 2013: 53).

From this we can see both the divide and the bridge between training and education. Training imparts selected knowledge and prepares the recipient for a task, role, job, or even profession (Wallace 2009). This guarantees a certain standard of performance. Education on the other hand liberates the student to acquire knowledge through rational thought and reflection. That knowledge is generic and can be applied in different contexts, a "*significant denotive difference*" (McCausland 2008:6). For crisis leaders to deploy resources "in novel and creative ways" (Stern 2013:53) which education encourages it is still necessary to be confident of the capabilities of those resources which training supports, emphasising the need for both education and training, albeit different student populations.

2. CONVENTIONAL PREPARATION: TRAINING, EXERCISES, AND EDUCATION

Training and exercising

Organisations, both public or commercial, invariably have their own training programmes to service their needs. In the UK, resilience training is managed by an internal market greatly influenced by central government austerity measures (Wilson & Gosiewska 2014) at the outsourced Emergency Planning College (EPC). The director of the EPC (Leigh 2012) has argued that training was undervalued and badly targeted, akin to "training tourism", that is a break from routine, and that austerity has meant that "training providers have to get smarter" (p2).

Training is often inherent in exercises which gather participants together to respond to a scenario with a view to testing procedures and awareness of them (Phelps 2011) with questionable benefits to individuals (Perry 2004; Berlin & Carlstrom 2015). Although lacking the stress and time pressure of real events, the relatively inexpensive 'table top' exercise has advantages not least being that it can incorporate training inputs and above all allows time for reflection (Borodzicz & van Haperen 2002). Software packages that focus on the decision-making process greatly reduce the need for the logistics, infrastructure and staff time and are now widely used (Newland et al. 1997; Crego 2008; Arbuthnot 2012; van den Heuvel et al. 2012).

Large-scale real-time exercises on the other hand are dynamic and provide participants with experience of the stress of an event (Phelps 2011) but realism is disruptive and extremely expensive (Lee et al. 2009). Learning is enhanced if there are opportunities for reflection and discussion (Berlin & Carlstrom 2015) and sometimes exercises are open to researchers (Devitt 2009). There are large-scale exercise programmes conducted in different jurisdictions, for instance the European Civil Protection Mechanism (EC 2010), the US National Exercise Program (FEMA 2011), and the UK secret ministerial counter-terrorism exercises revealed in the House of Lords by Baroness Neville-Jones (2009). Such exercises although expensive are considered valuable because they provide a "forum or context to test the effectiveness" of training, planning and capabilities (Perry 2004: 66) and expose erroneous assumptions offset by the benefits of arousing public interest (ibid) and networking (Alexander 2013). Unfortunately, that is not always the case. As we saw in chapter VIII *Hurricane Pam 2004* (IEM 2004) was a big budget, multi-agency exercise with realistic science based scenarios, revealing serious weaknesses in preparation, which were not addressed before Katrina (US Senate 2006), confirming the need "to distinguish between the many lessons observed and the few lessons learned" (Boin et al. 2005:157).

None of the above are ideal for educating crisis leaders or crisis leadership skills despite the faith that some have in such simulations (McCreight 2014). Large scale exercises, likened to a play by Doyle et al. (2015), require a script and cannot accommodate creative decisions or improvisation. They are also based on a myth of how crises, rather than emergencies or major incidents, are resolved which is rarely the command and control model on which exercises are based, i.e. leaders or teams making identifiable decisions. The resulting frustration is addressed with "more plans, which emphasise

further centralisation of authority: bureaucratic pyramids and a boss-of-bosses are supposed to forge coordination where it is not forthcoming spontaneously" Boin et al. (2005: 64).

Further insight was provided by Borodzicz (2004) who cautions that although there was good reason to train key decision-makers "performing one's role in a crisis simulation may be indicative of a player's ability to conform to an in-service organisational culture rather than deal with a real crisis" (p419). Significantly it was found that without exception a "positive outcome could be directly linked to creative or flexible rule breaking by key decision makers in the response" (p418) that is the need to "break the rules" to avoid a slide into a disaster, something very difficult to accommodate in planning an exercise. Carrel (2000) observed that although senior civil servants would gladly participate in high level workshops on management issues, leading a crisis team in a simulation was met with resistance. He described the difficulties that "even if a hypothetical scenario is used in a crisis simulation game, the willingness of civil servants to play around with new ideas and policies is very limited. The group-think phenomenon can quickly punish people who try something new" (p196).

Crisis Education

Sementelli (2007) explains the distinction between training and education in the context of crisis. Training would probably enable a manager to respond adequately but "will it provide the necessary opportunity for reflection or critique that might afford the same manager the opportunity to prevent the disaster or crisis?" (p508).

Accredited education provision, mostly postgraduate, in the UK for disaster management, resilience, etc., is advertised by several universities (www.postgrad.com), attracting small student numbers perhaps reflecting the limited employment prospects. Crisis as a distinct topic is rarely mentioned although there is a plethora of commercial non-accredited courses about crisis for practitioners to be found online.

In a call for papers for a special journal issue that opened with the presumption that "little has been published to teach our students about crises", as distinct from the associated fields of emergencies and disasters, and albeit with a business school leaning, the editor posed several generic questions including:

- "How can we translate the scholarship on crisis and disaster management into meaningful knowledge, skills, and abilities for our students?
- How should we design a standalone course in crisis management?
- What teaching techniques can improve students' ability to envision, get ready for, and respond to various types of crisis situations?" (Comer 2010:782).

In responding to this call for papers Lalonde and Roux-Dufort (2013) start by outlining the challenges of the subject. They begin with the limits of the available knowledge, its various theories, and lack of a universally accepted concept of crisis: frustrating for both teacher and student. In the introduction to the same special issue the editor reasserts the lack of crisis management education (Comer 2013) which is difficult to substantiate given the difficulty of getting an accurate picture across the overlapping fields of disaster management, civil protection, business continuity and resilience. Shrivastava et al. (2013) responded that whilst the wider field is a "vibrant area of scholarship and teaching" (p6) crisis is difficult to teach because it "is framed as an afterthought, as a remote possibility that one hopes will never happen to companies" (p7).

Some recent surveys of the education provision for disaster management and resilience across Europe have all concluded that the lack of standardised programmes, both education and training, is a concern given the part played internationally by the EU. Faber et al. (2014b) focussed on interdisciplinary programmes across Europe and found terminology to be a major barrier whilst Perdikou et al. (2014) discovered 58 programmes in 20 countries with the UK having the most courses by far. Both research teams had a parent discipline of the built environment whereas Ingrassia et al. (2014) and Khorram-Manesh et al. (2015) from medicine in their survey found that there were no standardised or competency based educational or training programmes despite the target student groups being first responders.   The issues of terminology and standardisation are very apparent in an internet survey made on behalf of the UN for the 2015 Global Assessment Report (Menoni et al. 2014).   Their findings differed considerably, presumably because the various studies were using different terms although they did note the number of courses in the US.

A wide-ranging perspective of emergency/disaster management education by Alexander (2013), albeit based on the current conventional degree structure, proposed a post-graduate T-shaped model, where a first degree in a complimentary discipline would provide the stem and a postgraduate degree in disaster/emergency management the

bar. However, often postgraduate students in such fields are mature students without a first degree although that is catered for in the evolving Recognition of Prior Learning (ENQA 2015).

Developments in US Homeland Security education

In the US, the picture is different, driven by 40,000 jurisdictions with officials responsible for emergency management and/or Homeland Security, a potentially large student pool with growing employment prospects (Brown 2015) and therefore interest to HEIs. From the internal US debate on curriculum we can see how emergency management and Homeland Security are converging towards a crisis management discipline.

In 1994 FEMA created a Higher Education Program to serve as the "nation's leading focal point for emergency management higher education … creating a cadre of professional emergency managers" (Blanchard 2008b: 5). During the first decade of the FEMA program there was an ongoing debate about curriculum and disciplinarity at their annual conferences (Darlington 1999; Philips 2005; Britton 2004; McEntire 2004; Britton & Lindsay 2005; Marks 2005) and as it has merged with Homeland Security the debate continues (Cwiak 2009, 2014).

Shortly after 9/11 McEntire (2002) provided a marker for the US:

> "There is no nationally recognised program of higher education at all. In fact, there is no generally accepted curriculum for homeland security, because there is no generally accepted body of knowledge upon which to base an academic discipline ... Worse there is no tradition of education for the senior practitioners of homeland security" (in Polson et al. 2010:1).

McEntire added that most crisis managers relied on experience and were unaware of the "concepts and organising principles" (ibid). A decade later Kiltz (2011) reiterated McEntire's assessment, saying "there is no agreed upon definition of homeland security, no grand theory explaining the phenomenon of homeland security, no standardized curriculum, little discussion of the history, paradigms and philosophies of the field, and ill- defined faculty roles" (p13).

The political concerns after 9/11 and Katrina renewed interest and investment in HE courses in emergency management and security and the new discipline of Homeland Security. McCreight (2009) reinvigorated the curriculum debate of the 1990s, remarking that homeland security professionals relied on "gritty experience" and ad hoc training (p1).   He went on to raise what he saw as major issues, including the degrading of the educational experience by solely working online which is common practice in the US for local officials, topics for a curriculum, and to what extent the educational programmes on offer meet the needs of practitioners.   Unusually he tackles the very practical challenge in providing a quality educational experience, that of "...finding faculty with sufficient practitioner and professional experience ..." remarking that academic theory should be "leavened heavily with real-world insights and perspective" (p4).

Kiltz (2009) responded that the aim should be to "develop individuals who can think critically and be engaged citizens" (p4) and she quotes the aspiration of "integrity in dealing with the many and diverse problems which need solving if the public interest is to be promoted" (O'Toole 1993:3 in Kiltz 2009:2).

Having raised several issues McCreight (2014) returns with a different approach acknowledging that for those employed in homeland security "solving complex problems dripping with ambiguity and limited detail is the norm" (p32) chiming with descriptions of crisis management (Heath 1998; Sementelli 2007).

Adding to the debate about what a curriculum should include, Ramsay and O'Sullivan (2013) make a case for adding environmental security to the cluster of homeland security topics given that extreme environmental events can lead to the "ultimate transnational security problem" (p11) and the new risks arising from climate change (O'Sullivan & Ramsay 2015:48). If we add social issues such as health, demographics, ageing, organised crime and human rights (Human Security Report Project 2011) we can see the synthesis of a crisis discipline. However, all that this might do is to add to the ongoing folly of listing topics to be included in an ever-expanding curriculum such as that proposed by McCreight (2014) which in practice has led to a disproportionate emphasis on technical and procedural issues for US emergency managers (Comfort & Wukich 2013; Brown 2015).

3. IMPLICATIONS FOR PRACTICE: THE NEEDS OF THE CRISIS EMON

Many scholars have emphasised the importance of collaboration in crisis resolution (Kiefer & Montjoy 2006; Waugh & Strieb 2006) but Silvia and McGuire (2010) set out to empirically test "leadership in a multi-actor, multi-sector settings" among public sector leaders in the US. Their findings point to leaders who are "integrative" and

- "take it upon themselves to approach network members as equals,
- share information across the network,
- share leadership roles,
- create trust, and
- be mindful of the external environment to identify resources and stakeholders" (p275).

In other words, they can function when "no one is in charge" (Crosby & Bryson 2005: 3).

3.1. The Potential Students

There would seem to be two target student populations. The first is the professional group that in the UK can be found in public services, including the established voluntary and private sectors and includes job titles like emergency planner, resilience manager, business continuity manager or in the US, emergency manager and/or homeland security advisor, with other jurisdictions having similar titles.

The second population are those crisis leaders who emerge when needed. They can be further subdivided into:

- organisational emergent crisis leaders who have already had a professional education in a specialist discipline, usually associated with investment in continuous professional development (CPD), and scientific advisers whose expertise may be needed to assist in identifying causes and consequences of crisis as well as aiding decision making, and
- community leaders: the more ephemeral but still important leaders who emerge from their communities when needed. They may have had a higher education, vocational training, or be self-taught.

The first group drives the discussion in the US about curriculum. A study by Comfort and Wukich (2013) revealed that in practice this focussed on lower-level skills, i.e. policies and procedures, agencies involved, and major risks, rather than the higher-level skills needed for changing circumstances and multi-organisational working in a crisis.

Organisational emergent crisis leaders

Although we cannot predict all the organisations that may become involved as the EMON evolves in response to a crisis (see Chapter VI), we can foresee some of the more likely members and the professional disciplines represented from both public and private sectors e.g. environment, utilities, health, engineering, tourism, construction, and public/business administration.   Most professionals must pursue academic and career development paths in their specialist field so that additional education in crisis must compete with other generic management skills such as budgeting. Yet it is from this diverse group that the *small world networks* (Comfort & Okada 2013: 63) of knowledge, skills, and capacity needed for a crisis develop into leadership from the collaboration of individuals who have different skills and backgrounds "but who trust one another to share information, correct errors, and develop a workable strategy of action" (p64).

Emergent leadership in communities

The importance of the community response is mentioned in the Sendai Framework for Disaster Risk Reduction 2015-2030 (UN ISDR 2015) which includes community in the rhetoric of "civil society, volunteers, organized voluntary work organizations and community-based organizations to participate, in collaboration with public institutions …" (p23).

Community resilience is a UK government strategy (Cabinet Office 2011b; 2016a) to "expand and deepen the government's partnership with the private and voluntary sectors, and with communities and individuals" (p5) and in support of this a planning toolkit was issued by government (Cabinet Office 2016b). The questions of who takes the initiative in a community and funding are unclear.

Norris et al (2008) focus on the social capacities needed by a community for collective resilience and list reducing risk and creating linkages and social support. They also emphasis crisis management with the need to "plan for not having a plan" (p127) for

unknown threats where flexibility, decision-making, and reliable information are needed (Longstaff 2005). These capacities may be over-ambitious but communities do have skills, often amongst retirees, which could be tapped through wards and parish councils.

3.2. The Appropriate Educational/Vocational Level

Whatever their discipline those students with accredited academic or professional qualifications can map them against generic descriptors in the UK qualifications framework (QAA 2008). The generic qualities and achievements in the framework fit well with crisis management and tacit and vocational knowledge and experience can be allowed for by concentrating on the descriptors and individuals' attributes rather than the award. Thus, it is expected that level 7 postgraduates in the above framework (Masters) can "deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences" and that they will have "the qualities and transferable skills necessary for employment requiring: the exercise of initiative and personal responsibility, decision-making in complex and unpredictable situations, [and] the independent learning ability required for continuing professional development." (p20).

The challenge is how to use education and the diverse tacit and disciplinary knowledge of potential emergent leaders to meld them into an effective EMON member, with the added issue that they may never be actively involved in a crisis. My thesis is that crises will become more frequent, transboundary and novel (see Chapter IV) so that the likelihood of involvement increases, justifying the students' investment.

The skills and attributes in the QAA (2008) framework equate to the "mastery" of Ambrose et al. 2010 where "unconscious competency" (p97) is achieved through progression summarised in Figure 6.

Figure 6: Stages in the development of "mastery" (Ambrose et al 2010: 97)
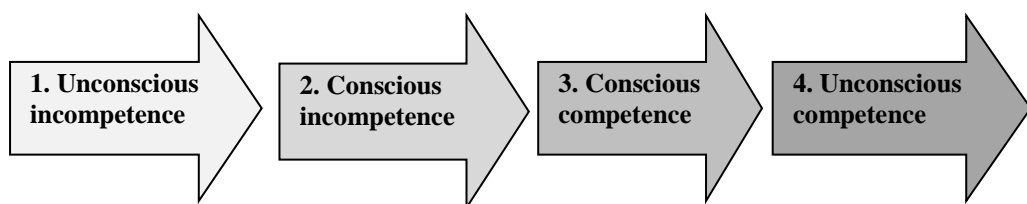
The crisis EMON may include representatives without a higher education but who are at the higher levels, e.g. "proficient" or "expert", of the Dreyfus and Dreyfus (1986) vocational progression model.   In this model the expert can operate without guidelines relying on intuition and tacit understanding with analysis limited to new situations or problems. Despite criticism that the model is less useful for situations that require a problem-solving approach (Eraut 2008: 4) it tracks the progression in the workplace towards unconscious mastery. Mastery (Ambrose et al. 2010) is limited to a discipline, and its unconscious achievement, together with the expert's dependence on tacit knowledge, may be a factor in designing an inter-disciplinary vocational crisis course. Individual EMON representatives will need to appreciate that other members are at the same generic level but not in their domain and present their specialism accordingly. Thus, there is a need for students to understand the nature of their unconscious and tacit proficiency and "recontextualise" (Barnett 2006: 146) their knowledge and communicate it, as well as accept such knowledge from unfamiliar disciplines.

3.3. Isomorphic Interdisciplinary Learning

Although crisis management education is under-developed, the concept of isomorphism, usually applied to organisms having similar form but different evolutionary origins, was used as a metaphor by Toft (1992) to examine how organisations might learn or fail to learn from accidents that take different forms but have common lessons. The idea was extended to different organisations operating in the same industry or using similar technology or materials (Toft & Reynolds 2005) and could apply for instance to lessons for flood managers in The Netherlands extracted from the Katrina disaster (Wesselink 2007; Engel et al. 2012) or the transfer of best practice to government from the private sector's response in Katrina (Horwitz 2008).

Isomorphic learning can also be internalised in that departments within very large organisations can learn from the experience of other groups (ibid) and an example is the experience of the US military in Katrina (Davis et al. 2007). Some thought has been given in the US military establishment about the post-Cold War broadening role of armed forces (Johnson 2002), moving from war-fighting to humanitarian missions (Fassin & Pandolfi 2010; Carpenter & Kent 2015), counter-terrorism (Doyle & Elsea 2012), and working alongside Private Military Contractors (Liu 2010). Associated with this are studies of the changes that will be needed to the development and selection of future military leaders for these new environments (Reed et al. 2004; Fielder2011; Boe

2016) whilst retaining the conventional *warrior* skills (Hannah 2010), and where working with interagency, intergovernmental, and multinational networks, e.g. an EMON, is a leadership challenge (Markel et al. 2010). The latter aspect has been taken a step further by Chido (2016) considering how the military may have to interact in megacities with *alternative government structures*, e.g. war lords, as part of network leadership.

A difficulty with preparing students for future crises by learning from past crises is the "lack of fit" (Elliot & Macpherson 2010: 547). As an example, Deverell (2012a) drew parallels between the 1999 Soho Nail Bomber, and the 2005 London Bombings. The large number of injured in 1999 over three weeks led to a new post in Ambulance control to distribute casualties between hospitals.   In the 2005 bombings, the new role was completely overwhelmed. This and other examples caused Deverell to conclude that "it is unlikely that learning from previous experience will be sufficient when new and dynamic crisis events occur" (p35), the key being "sufficient" which he links with encouraging flexibility in novel scenarios although "sloppy management" (Turner 1994: 216) i.e. not recognising the problem earlier, could be an alternative explanation.

Learning for new and dynamic crises by learning 'on the job' within a crisis response network, akin to vocational training (Barnett 2006), is illustrated in a case study of the agencies that dealt with an outbreak of an animal disease, Exotic Newcastle Disease, in the southern states of the US in 2003-4 (Moynihan 2008). The network or EMON (Dynes 1970) involved state and local governments and scientific advisers, public health, veterinary, law enforcement, environment, Hispanic interpreters, and forestry service, with many workers on temporary secondment, making a total of 7000 people. The outbreak did not follow the contingency plans and temporary staff had to learn from other members already in place, in a progression reminiscent of the Dreyfus (1986) model.

3.4. Professional and Vocational Learning

It is not enough for a crisis curriculum to be interdisciplinary, it must recognise different levels of knowledge, skills, and experience, as well as bridge the gap between academic knowledge and vocational knowledge. This was summed up by Layton (1993) for engineering as "what is needed for solving a technological problem may have to be drawn from diverse areas of academic science at different levels of abstraction and then synthesised" (p58) or repackaged.

There are other models that we can use with medicine providing an appropriate example because apart from shared altruism it has recognised the gap between knowledge from research and the tacit knowledge of practitioners, labelled as translational studies or the 'Bench-to-Bedside' and now 'Valleys-of-Death' models (Green & Seifert 2005; Butler 2008). The latter model indicates where new knowledge must cross from basic science to human trials to implementation in practice and finally to outcomes but can get lost in the metaphorical valleys (Tugwell & Knottnerus 2015). The one direction valley metaphor is taken a stage further with a translational "bridge" across the valleys by Aymerich et al. (2014:2) which enables two-way exchange of knowledge, useful in medical education but also applicable to other areas of higher education, perhaps crisis management.

The "bridge" may provide a model but it does not translate disciplinary research into something that practitioners can use. Layton (1993) described how vocational knowledge "necessitates building back … all the complications of real-life, reversing the process of reductionism" that experimental science relies on (p59). Barnett (2006) coined the term "pedagogic recontextualization" (p146) for this process but if we are designing a vocational curriculum we might give the student "insight into the … 'reservoir' of disciplinary knowledges on which the particular syllabus has drawn" (ibid). This requires a judgement to be made "to strike a balance between offering learners time and freedom to engage with these forms of knowledge in their own terms and to consider them in relation to practice" (Evans et al. 2010: 249). Given the unpredictable context of crisis a useful skill for the student might be to understand this process so that they can then make such judgements for themselves as situations arise.

An important aspect of a curriculum for the *novel crisis* is that it should be future facing (Ryan & Tilbury 2013) to allow for changes both in the external environment (Foresight 2011a, 2012) and in Higher Education (Duderstadt 2009; Blass et al. 2010; Souto-Otero 2011; The 1994 Group 2012; Barber, Donnelly & Rizvi 2013; Fielden & Middlehurst 2016; Foresight 2016). The inclusion of foresight or future studies in the curriculum (Hines & Gold 2013) could be justified, certainly for professional crisis managers, because it might avoid rude surprises (Longstaff 2005; LaPorte 2005) and crisis "signals come from all kinds of sources: some loud, some soft, some accurate, some widely off the mark. But how to tell which is which?" (Boin et al. 2005: 11). For potential emergent crisis leaders, some insight into the value of the products of foresight should

feature in the curriculum to enable them to distinguish between the measured predictions of the IPCC (2014) for example and the imaginative discussion of Baum et al. (2015) on surviving global catastrophes.

Researchers examining the contribution that the built-environment discipline can make to resilience and disaster risk reduction have considered how HEIs can link professional education to life-long learning (Siriwardena et al. 2013) perhaps through continuous alumni engagement and collaboration with industry (Thayaparan et al. 2014) whilst others have speculated about a flexible professional doctorate for the discipline (Malalgoda et al. 2016; Babatunde et al. 2016). These are encouraging developments, matching the competing demands of education and professionals' work-life commitments.

3.5. Delivery

In calling for crisis leaders with imagination Lagadec (2009a) himself uses imagination in his analogy of crises having evolved past "the bounds of compartmentalised emergency into the vastness of unstable and chaotic Terrae Incognitae" (474). This certainly conveys a picture of a very challenging world for our students with an equally challenging task for practitioner-researchers and educators.

Lagadec's call for new thinking has been answered internationally by a few institutions, the Disaster Resilience Leadership MSc at Tulane University, Louisiana USA, the crisis leadership program at the Harvard Kennedy School and the Australian Institute of Emergency Management (AEMI). The latter has been running a professional course since 2010 because the "command role does not provide the intangible elements of leadership or necessarily facilitate an adaptable and flexible approach to a non-routine situation" (Owen et al. 2015: 16). The Australian initiative is described by the course facilitators (ibid) but it is difficult to gauge the success or otherwise of the programme on the details given. However, they do observe that it is a pedagogical challenge and advise against distant learning because "the leadership discourse depends on discussion. The practice of leadership demands practice. There needs to be mindfulness of the powerful unquantifiable benefit that comes from face-to-face exchange" (p19).

Although Shrivastava et al. (2013) have imagined what a crisis leadership curriculum might include, Powley and Taylor (2014) evaluate their own attempt at including crisis

as part of a management education programme. Their focus is on developing "strong character and moral values" (p562) and critical thinking, quoting Kiltz (2009: 10) as the ability to "identify issues and assumptions, recognise important relationships, make correct inferences, evaluate evidence or authority, and deduce conclusions" (p654). The approach by Powley and Taylor is twofold. Their MBA students take their experience of an "extreme personalised case" to write reflectively for a class discussion. Later, students working in groups are given a particular case, thought to have leadership issues, to examine and prepare a poster presentation followed by critical peer discussion. The authors provided enough detail for the initiative to be replicated but of course we have no way of knowing how successful the learning is when tested by a crisis.

The mechanism for delivering a suitable multi-discipline crisis leadership course is already available in the form of the university Short Course, either the stand-alone accredited module or non-accredited CPD course. Both can be a joint venture with professional institutes and can adopt the concept of Bruner's spiral curriculum (Johnston 2012) enabling students to participate at different levels of study. There is personal investment by teaching staff and students but little risk to the institution, whatever form this might take in the future.

3.6. Educational Issues for Future Crisis Leadership

Harking back to Borodzicz's (2004) point that success in crisis requires unorthodox decisions, according to Lagadec (2009) future crisis leaders "must be mentally prepared to adopt an approach … that is more creative than procedural" (p480). He concludes that it would be foolish to educate the next generation to manage the last generation's crises and he also acknowledges the difficulties in influencing decision makers because "the subject is so foreign to their frame of reference; they will be too fearful of the risks to consider and construct creative solutions" (ibid). He goes on to warn against the two pitfalls that are present in extreme crises, namely bureaucratic inertia, i.e. waiting until the crisis conditions fit the plans, and "the general loss of nerve" (p480). The conventional aim of the crisis leader is to resume 'business as usual' or 'return to normality' in what has been described by Gilpin and Murphy (2008) as the dominant paradigm where the future is predictable, where it is possible to control events through systems, and where stability is the desirable and achievable outcome of crisis management. Complexity reframes these assumptions so that it is not possible to fully

control either events or peoples' perception of events; ambiguity and uncertainty are unavoidable; and stability is undesirable because it signifies an inert state (p107).

The unknowable was a feature of Beck's (2006) world risk society that "we do not know what it is we don't know – but from this, dangers arise which threaten mankind!" (p329) and he has since returned to the inconceivable in future crises (Beck 2014; 2016). Students and practitioners of crisis will be familiar with the exposition by the US Secretary of Defense, Ronald Rumsfeld "… there are known knowns; there are things we know we know ... But there are also unknown unknowns -- the ones we don't know we don't know" (2002: 11) and although often derided the issue he raises leads me to my next point.

Ethics and crisis

Lagadec's (2009a, 2009b) call for imagination and creativity in crisis leadership, echoed by many writers, is complicated by the need to make decisions with limited information but with post-event accountability and potential personal consequences. For example, in the context of post-Katrina New Orleans, many who took the initiative had no way of knowing at the time how long the crisis would last, indeed whether rescue would ever happen, and how they might be judged. In a future novel crisis, we might be faced with even greater uncertainty which is the point of Lagadec's (2009) metaphor of *terra incognita*. The context may be an unprecedented challenge to the legal advice which the established organisations (Dynes 1970) have access to. For instance, the invocation of emergency powers in the UK (Civil Contingencies Act 2004) is restrained by the subjective 'Triple Lock' of seriousness, necessity, and geographical proportionality (sections 19-21), but there is an absolute expectation of reasonableness by Ministers (Walker & Broderick 2006: 154). This assumes a functioning state infrastructure which arguably New Orleans was not (Burns & Thomas 2006). Therefore, creative solutions must be tempered with reflexivity and a moral or ethical framework (Lawton & Paez 2015) and this needs to be included in the curriculum, as it was in Powley and Taylor (2014) above.

 There is considerable literature on ethical leadership but it assumes an organisational setting where I am envisaging the disruption of organisational response. At what could be described as the entry level of the spiral curriculum the diagram of "Reflexive Questions" (Patton 2002: 66) is as equally applicable to practitioners with minor

changes as it is to researchers. At the other end of the scale "critical-reflexivity" is advocated by Cunliffe (2009; 2016) as a technique for "examining and unsettling our assumptions, actions and their impact" on others (2009: 99) and used in teaching on an EMBA programme. The above, together with the ideas related to the novel crisis paradigm (Gardiner 2010, Amsler 2010) and the discussion of Zack (2011) about 'lifeboat ethics' (p33) and the global water crisis (p128) would be useful to stimulate thinking among students from different disciplines, many of whom will have ethical standards from their practice which they can relate to.

Terminology and Curriculum

The issue of terminology needs to be addressed. It is commented on by many authors and comprehensively summarised by Phillips 2005:

> "Academics know that they are telegraphing messages with each term. Each term carries baggage, each offers potential; each word carries implications for consulting the body of knowledge used when designing research, and for conceptualizing and operationalizing research variables" (p113).

On a practical note, she added that it was thus difficult for employers to understand what knowledge a graduate might have, and this would also apply to colleagues in a crisis network. This is a major frustration if we want to provide multi-disciplinary support to crisis leaders confronting messes (Ackoff 1979), super-complexity (Barnett 2004), and wicked problems (Rittel & Webber 1973).

As for the curriculum, the consensus among leading thinkers in the field of crisis is that we should be teaching students "how to think not what to think" (Reed et al. 2004: 55). Writing about emergency management "high-order skills", Comfort and Wukich (2011: 57) advocate that "it is essential that students understand the importance of moving beyond laws, policies, and procedures to learn how to operate within this context as functioning decision-makers". This is reiterated by Shrivastava et al. (2013) who contend that **"**education in crisis management needs to be socially and historically contextualised … engaging participants as whole persons and responsible members of communities.   Thus, crisis management skills must include emotional, aesthetic, spiritual, and ethical commitments" (p19).

4. CONCLUSION: REFLECTION ON THE CHALLENGE

My argument for a crisis leadership curriculum rests on three converging issues, the most important being the anticipated paradigm shift towards the *novel crisis* which is linked to global social and environmental changes and their unforeseeable consequences.   The other contributing issues are global interconnectedness and changes to Higher Education.   My thesis hinges on this convergence but it is possible that this paradigm shift will reverse and the various trends that threaten us might only be temporary anomalies. Faced with climate change scepticism Beck (2016: 45) used the mathematician Pascal's (1623-1662) reasoning about the existence of God, "what harm will come to you if you gamble on its truth and it proves false? If you gain, you gain all; if you lose, you lose nothing."

In the context of the novel crisis, if we do nothing future events may cause us to regret the missed opportunity. At worst, supporting a short course or similar educational tool to improve our crisis pedagogy involves small risk with potential gains, especially since such courses are already well established for many subject areas and occupations. As has been made clear this is not the time to be adding to a curriculum, rather it is an opportunity to consider the essence of what it is to be an emergent crisis leader using evidence and ideas from the literature review and the case study of Katrina.   The curriculum could be the basis of an accredited inter-disciplinary emergent crisis leadership Short Course or free-standing module with CPD provision delivered in parallel.

 One of the challenges in thinking about the future and change is the need to envisage the possible scenarios. Whilst Katrina has provided evidence of the degrading of many response institutions that were relied upon, imagination is still needed to appreciate the full extent of the situation and the nuances of the interactions that occurred between those that were appointed, self-appointed, or thrust into the crisis EMON. That is why the accounts of those caught up in crisis are so important to help visualise the disruption and suffering, rather than the dry official or academic distillations of events.

Those involved in exercises and in responding to conventional crises, however testing the scenarios might be, can assume that everyday life continues around them and that they will eventually return to this normality. The disruption that the novel crisis entails may involve infrastructure failures, particularly connectivity, but there is also the

emotional disruption for individuals of not knowing if their social groups are safe whilst being expected to play an effective role. One immediate benefit of taking part in a short course, whether face-to-face or virtual, is that it can be a precursor to involvement in a crisis EMON, providing the participant with an opportunity to envisage and reflect on their potential role. Another benefit is the building of personal networks, so important in quickly establishing trust in a crisis.

The useful role that liaison officers play in a crisis is mentioned in the case study and recently in research on the response to Australian bush fires (Curnin et al. 2015). Although the role has been the domain of the military and emergency services, the concept could be broadened to include representatives from other organisations and specialisms involved in a novel crisis EMON.

To equip individuals for this conceptual liaison role the first topic on the curriculum would be to construct a generic high-level framework of the international and domestic crisis response systems and then assist students to customise this and add their parent organisation or community.   Students can then present their organisation's responsibilities, capabilities and limitations to their colleagues as a rehearsal for what might one day be expected of them in a crisis EMON meeting. To encourage creativity students could assume a quite different perspective e.g. military as social services, and then repeat the exercise, with testing scenarios for context similar to those used in emergency planning (Alexander 2000). Wack (1985) described scenario modelling as comprising both "the world of facts and the world of perceptions" (p142) with the latter existing in the heads of decision makers which might now extend to the electorate, and other stakeholders.   In what they describe as action learning pedagogy Bradfield et al. (2015) provide an account of their use of scenario analysis to tackle *wicked problems* for international students from different backgrounds on their MBA course.   They note the effectiveness of the technique but warn about the time constraints which may require it to be adapted if it is to be included in a Short Course.

The novel crisis may be unprecedented and unforeseen. If there is no precedent it is likely that there will be no guidance, either moral or statutory, to assist crisis leaders in framing their decisions. If the disruption is catastrophic, crisis leaders may be without communication for long periods. It may not even be possible to predict how long the isolation may last or if the crisis has brought a new normality. In an early chapter I discussed the paradox of crisis leadership, that is the need to break rules to be effective

but within the ethical framework of civil society (chapter II section 3.5). Achieving this balance must be a key element of any course on crisis leadership with the reminder that personal accountability may be a consequence, even if it is delayed.

Imagination and creativity can be encouraged through analysis of case studies where one or more elements are then changed presenting a different or greater challenge e.g. visualising the Buncefield 2005 fire occurring on a working day resulting in mass casualties, a predictable scenario for emergency planners and one to which Alexander's (2015) methodology could be applied.

Not long ago a characteristic of crisis was the need to make urgent decisions despite lack of information but this has changed: now technology means that information may be limitless and overwhelming. This issue will only grow and although software can filter and organise information human judgement is still needed. An exercise that could assist is the judicious analysis of cases that illustrate crucial decisions, comparing the information acted on at the time and what we now know with hindsight to have been overlooked or misinterpreted e.g. the analysis by Jenkins et al. (2010) of the shooting by police of Jean Charles de Menezes at Stockwell Underground station in July 2005.

Contribution to the Practice of Education

In crisis and the many associated subject areas there is a less than rigorous terminology that leads to confusion and frustration for both scholar and practitioner. I have added my own working definition of crisis to distinguish *crisis* from its *crisis context, the latter* including terms such as civil protection, emergencies, disasters and catastrophe. I have taken a particular definition of catastrophe based on Quarantelli (2006) to describe Katrina's impact on New Orleans' social infrastructure which I used as the case study to explore crisis leadership.

I accept that conventional degree programmes under various guises such as civil protection, emergency planning, disaster risk reduction, and increasingly resilience, still have a purpose. The systematic approach to hazards, risk management, legislation, governance, and capabilities has a place for scholars and for officials in relevant careers. However, there are many pressures on Higher Education which make it timely to consider alternatives. Such pressures include changes to student profiles and employment patterns, austerity policies, globalisation and competition, and in the UK the implications and opportunities in Higher Education and Research Act 2017.

The premise is that crises, and especially future crises, require multi-disciplined and multi-organisational solutions and leadership.   I am proposing something different from the conventional degree programme for the much larger number of leaders, managers, or advisors, who may become involved in the response to crises but will have their specialist continuous professional development (CPD) that must take precedence. Crisis education for them will focus on higher-order transferable skills that are generic and future-proof and do not compete with but are complimentary to their other commitments.

Few people employed as day-to-day leaders in organisations expect to be active crisis leaders so in a sense the skills are relevant to all who may find themselves unexpectedly in such a role.

The means of delivery already exists in the form of the accredited Short Course or free-standing postgraduate module that could be available as an addition to any academic programme for the student's specialist or professional development.

The overall objective is the preparation of polymath leadership equipped to face the challenge of the novel crisis. The learning objectives include ethical awareness, reflexivity, communication and information management, and fostering imagination and creativity. This cannot be achieved in a few days but a Short Course can sow a seed, encouraging potential crisis leaders to reflect on and foster the above objectives within their specialist domains or communities. The alternative would be to continue creating more and bigger: plans, response systems, and training courses.

REFERENCES

Abbott, C. (2008). *An Uncertain Future: law enforcement, national security and climate change.* London: Oxford Research Group: (2.6.17) http://oxfordresearchgroup.org.uk/sites/default/files/uncertainfuture.pdf

ABC News. (2005). Troops told 'shoot to kill' in New Orleans *ABC News Online*: (2.6.17) http://www.abc.net.au/news/2005-09-02/troops-told-shoot-to-kill-in-new-orleans/2094678

Abrams, L. (2010). *Oral History Theory*. London: Routledge.

Abramson, D., & Redlener, I. (2013). Editorial: Hurricane Sandy: Lessons learned, again. *Disaster Medicine and Public Health Preparedness, 6*(4), 328-329.

Ackoff, R. (1979). *Re-Creating the Corporation*. New York: Oxford University Press.

ACPO. (2007). Practice Advice on Critical Incident Management: National Police Improvement Agency.

Adams, G., & Balfour, D. (2007). *Leadership, Administrative Evil and the Ethics of Incompetence: Lessons from Katrina and Iraq*. Paper presented at the Leading the Future of the Public Sector: The Third Transatlantic Dialogue, Workshop Six: Ethical Leadership in the Context of Globalisation, University of Delaware, Newark USA.

Agranoff, R. (2004). Leveraging networks: A guide for public managers working across organizations. In J. Kamensky & T. Burlin (Eds.), *Collaboration using Partnerships and Networks* (pp. 61-102). New York: Rowman & Littlefield.

Akandji-Kombe, J. (2006). Positive Obligations under the European Convention on Human Rights. Brussels: Council of Europe.

Albala-Bertrand, J. (2000). Responses to complex humanitarian emergencies and natural disasters: an analytical comparison. *Third World Quarterly, 21*(2), 215-227.

Alexander, D. (2000). Scenario methodology for teaching principles of emergency management. *Disaster Prevention and Management, 9*(2), 89-97.

Alexander, D. (2002a). *Principles of Emergency Planning and Management*: Oxford University Press.

Alexander, D. (2002b). From civil defence to civil protection - and back again. *Disaster Prevention and Management, 11*(3), 209-213.

Alexander, D. (2007a). Misconception as a barrier to teaching about disasters. *Prehospital and Disaster Medicine, 22*(2), 95-103.

Alexander, D. (2007b). Making research on geological hazards relevant to stakeholders' needs. *Quaternary International, 171*(172), 186-192.

Alexander, D. (2008). Emergency command systems and major earthquake disasters. *J of Seismology and Earthquake Engineering, 10*(3), 137-144.

Alexander, D. (2013a). Approaches to emergency management teaching at the Master's level. *J of Emergency Management, 11*(1), 59-72.

Alexander, D. (2013b). Resilience and disaster risk reduction: an etymological journey. *Natural Hazards and Earth Systems, 13*, 2707-2716.

Alexander, D. (2015). Disaster and Emergency Planning for Preparedness, Response, and Recovery *Oxford Research Encyclopaedia, Natural Hazard Science*. USA: Oxford University Press.

Allen, C., Angeler, D., Garmestani, A., Gunderson, L., & Holling, C. (2014). Panarchy: Theory and Application. *Ecosystems, 17*(4), 578-589.

Allen, D., Karanasios, S., & Norman, A. (2013). Information sharing and interoperability: the case of major incident management. *European J of Information Systems*, 1-15.

Alpaslan, C., & Mitroff, I. (2011). *Swans, Swine, and Swindlers: Coping with the Growing Threat of Mega-Crises and Mega-Messes*: Stanford University Press.

Amabile, T., Schatzel, E., Moneta, G., & Kramer, S. (2004). Leader behaviors and the work environment for creativity: perceived leader support. *The Leadership Quarterly, 15*, 5-32.

Amanatidou, E., Butter, M., Carabias, V., Konnola, T., Leis, M., Saritas, O., . . . van Rij7, V. (2012). On concepts and methods in horizon scanning: Lessons from initiating policy dialogues on emerging issues. *Science and Public Policy, 39*, 208-221.

Ambrose, S., Bridges, M., Lovett, M., DiPietro, M., & Norman, M. (2010). *How Learning Works: 7 Research Based Principles for Smart Teaching*. San Francisco: Josssey-Bass.

Amsler, S. (2010). Bringing hope to 'crisis': crisis thinking, ethical action and social change. In S. Skrimshire (Ed.), *Future Ethics* (pp. 129-152). London: Continuum.

Ancelet, B., Gaudet, M., & Lindahl, C. (Eds.). (2013). *Second Line Rescue: Improvised Responses to Katrina and Rita*: University Press of Mississippi

Anderson, B. (2015). What kind of thing is resilience? *Politics, 35*(1), 60-66.

Anderson, W., & Farber, D. (2006). "This Isn't Representative of Our Department": Lessons from Hurricane Katrina for Police Disaster Response Planning: University of California Law School.

Andres, L., & Carpenter, S. (1997). *Today's Higher Education Students: Issues of Admission, Retention, Transfer, and Attrition in Relation to Changing Student Demographics*. Vancouver: Centre for Policy Studies in Education, University of British Columbia.

Andrienko, N., & Andrienko, G. (2006). *Intelligent visualisation and information presentation for civil crisis management*. Paper presented at the 9th AGILE Conference on Geographic Information Science, Visegrad, Hungary.

http://www.slideshare.net/Nostrad/intelligent-visualisation-and-information-presentation-for

Angell, M. (1990). The Nazi Hypothermia Experiments and Unethical Research Today. *New England Journal of Medecine, 322*, 1462-1464.

Angle, R., Bell, H., Beausoleil, J., & Lein, L. (2012). *Community Lost: The State, Civil Society and Displaced Survivors of Hurricane Katrina*. Cambridge: Cambridge University Press.

Ansell, C., Boin, A., & Keller, A. (2010). Managing Transboundary Crises: Identifying the Building Blocks of an Effective Response System. *J of Contingencies and Crisis Management, 18*(4), 195-2007.

AON Benfield. (2013). Geomagnetic Storms. London: AON Benfield Hazard Research Centre, University College London.

Aradau, C., & van Munster, R. (2011). *Politics of Catastrophe: Genealogies of the Unknown*. Oxon: Routledge.

Arbuthnot, K. (2008). A command gap? A practitioner's analysis of the value of comparisons between the UK's military and emergency services' command and control models in the context of UK resilience operations. *J of Contingencies and Crisis Management, 16*(4), 186-194.

Arbuthnot, K. (2012). Gold Command Training in the Fire and Rescue Service. *Alert, Spring 2012*, 6-8.

Arias-Hernandez, R., & Fisher, B. (2014). Designing visual analytic tools for emergency operation centers: a qualitative approach. *International Journal of Information Systems for Crisis Response and Management, 6*(3).

Associated Press. (2016). New Orleans police officers plead guilty to reduced charges in Katrina shootings. *The Guardian*.

Attorney General. (2013). Attorney General's Guidelines on Disclosure: for investigators, prosecutors and defence practitioners. London, Attorney General's Office [The Rt Hon Dominic Grieve QC]: (2.6.17) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/262994/AG_Disclosure_Guidelines_-_December_2013.pdf

Auer, J., & Lampkin, L. (2006). *Open and Operating? An Assessment of Louisiana Nonprofit Health and Human Services after Hurricanes Katrina and Rita*. The Urban Institute: (2.6.17) http://www.urban.org/sites/default/files/alfresco/publication-pdfs/900916-Open-and-Operating-An-Assessment-of-Louisiana-Nonprofit-Health-and-Human-Services-after-Hurricanes-Katrina-and-Rita.PDF

Auerswald, P., Branscomb, L, La Porte, T & Michel-Kerjan, E. (Ed.) (2006). *Seeds of Disaster, Roots of Response: how private action can reduce public vulnerability.*: Cambridge University Press.

Auf der Heide, E. (1989). *Disaster Response: Principles of Preparation and Coordination*. St Louis, Missouri: C V Mosby.

Avolio, B., Walumbwa, F., & Weber, T. (2009). Leadership: current theories, research, and future directions. *Annual review of Psychology, 60*, 421-449.

Aymerich, M., Rodriguez-Jareño, M. C., Castells, X., Carrion, C., Zamora, A., & Capellá, D. (2014). Translational research: a concept emerged from health sciences and exportable to education sciences.

Babatunde, S., Ginige, K., Adeniyi, O., Perera, S., & Amaratunga, D. (2016). *Development of a professional doctoral programme in built environment to enhance societal resilience to disasters.* Paper presented at the Proceedings of the 5th World Construction Symposium 2016.

Badaracco, J. (2002). *Leading Quietly: An Unorthodox Guide to Doing the Right Thing*. Boston MA: Harvard Business Press.

Bahamonde, M. (2005). Evidence to the Committee on Homeland Security and Governmental Affairs. Washington DC: United States Senate.

Bailey, R. (2010). The case of Dr Anna Pou - Physician Liability in Emergency Situations. *American Medical Association Journal of Ethics (Virtual mentor), 12*(6), 726-730.

Baker, D., & Refsgaard, K. (2007). Institutional development and scale matching in disaster response management. *Ecological Economics, 63*, 331-343.

Baker, G., & Chapman, D. (Eds.). (1962). *Man and Society in Disaster*. New York: Basic Books.

Banks, D. L., & Carley, K. M. (1996). Models for network evolution. *The Journal of Mathematical Sociology, 21*(1-2), 173-196.

Barber, B. (2014). *If Mayors Ruled the World*. London: Yale University Press.

Barber, K., Hidalgo, D., Haney, T., Weeber, S., Pardee, J., & Day, J. (2007). Narrating the Storm: Storytelling as a Methodological Approach to Understanding Hurricane Katrina. *J of Public Management & Social Policy, Fall*, 99-120.

Barber, M., Donnelly, K., & Rizvi, S. (2013). *An Avalanche is Coming: Higher Education and the Revolution Ahead*: Institute for Policy Research.

Barnett, J., & Adger, W. N. (2007). Climate change, human security and violent conflict. *Political Geography, 26*, 639-655.

Barnett, M. (2006). Vocational knowledge and vocational pedagogy. In M. Young & J. Gamble (Eds.), *Knowledge, Curriculum and Qualifications for South African Further Education* (pp. 143-157).

Barnett, R. (2004). Learning for an unknown future. *Higher Education Research & Development, 23*(3), 247-260.

Barnier, M. (2006). *For a European Civil Protection Force*: Europe Aid. Brussels: EU.

Barras, J. A. (2005). Land area changes in coastal Louisiana after Hurricanes Katrina and Rita *Science and the storms: the USGS response to the hurricanes of* (pp. 98-113).

Barrett, B., & Howells, R. (1992). Legal responsibilities for industrial emergency planning in the UK. In D. Parker & J. Handmer (Eds.), *Hazard Management and Emergency Planning: Perspectives on Britain* (pp. 75-93). London: James & James.

Barron Ausbrooks, C., Barrett, E., & Martinez-Cosio, M. (2009). Ethical Issues in Disaster Research: Lessons from Hurricane Katrina. *Population Research and Policy Review, 28*(1), 93-106. doi:10.1007/s11113-008-9112-7

Barthel, P.-A. (2010). Arab mega-projects: between the Dubai effect, global crisis, social mobilization and a sustainable shift. *Built Environment, 36*(2), 133-145.

Barton, A. (1962). The Emergency Social System. In G. Baker & D. Chapman (Eds.), *Man and Society in Disaster* (pp. 222-267). New York: Basic Books.

Barton, A. (1969). *Communities in disaster: A sociological analysis of collective stress situations.* Garden City, NY: Doubleday.

Bassey, M. (2003). Case study research. In J. Swann & J. Pratt (Eds.), *Educational Research in Practice*. London: Continuum.

Bateman, T. (2008). Leading for Results: brief-but-powerful lessons from Katrina and Iraq. *Organizational Dynamics, 37*(4), 301-312.

Baubion, C. (2013). OECD Risk Management: Strategic Crisis Management. Geneva: OECD.

Baum, D. (2006, 9.1.2006). Deluged: When Katrina hit, where were the police? *New Yorker,* 50-63.

Baum, S., & Tonn, B. (2015). Introduction: Confronting future catastrophic threats to humanity. *Futures, 72* (Catastrophic Threats), 1-3.

Baum, S., Denkenberger, D., & Haqq-Misra, J. (2015). Isolated refuges for surviving global catastrophes. *Futures, 72*, 45-56.

Bayard, T. (2005). Hurricane Katrina 2005: After Action Summary. New Orleans Police Department Interoffice Correspondence.

Bayard, T. (2006). Testimony of Captain Timothy P. Bayard Commander of the Vice Crimes / Narcotics Section of the New Orleans Police Department before the Senate Committee on Homeland Security and Governmental Affairs Monday, January 30, 2006, 2:00 p.m. Washington DC: (3.6.17) http://www.columbia.edu/itc/journalism/cases/katrina/Federal%20Governmen t/Congress/U.S.%20Senate/Senate%20Hearings/Senate%20Hearing%202006-01-30/Bayard%202006-01-30.pdf.

Bayram, J. D., Kysia, R., & Kirsch, T. D. (2012). Disaster metrics: a proposed quantitative assessment tool in complex humanitarian emergencies - The Public Health Impact Severity Scale (PHISS). *PLoS Currents, 4*, e4f7b4bab0d1a3.

Bea, K. (2007). Federal emergency management policy changes after Hurricane Katrina: A summary of statutory provisions. Washington DC, Congressional Research Service: (3.6.17) http://fas.org/sgp/crs/homesec/RL33729.pdf

Beck, U. (1992). *Risk Society: Towards a New Modernity*. London: Sage.

Beck, U. (2002). The Terrorist Threat: World Risk Society Revisited. *Theory, Culture and Society, 19*(4), 31-55.

Beck, U. (2006). Living in the world risk society. *Economy and Society, 35*(3), 329-345.

Beck, U. (2014). How Climate Change Might Save the World. *Development and Society, 42*(2), 169-183.

Beck, U. (2016). *The Metamorphosis of the World*. Cambridge: Polity.

Beddington, J. (2013). The science and art of effective advice. In R. Doubleday & J. Wilsdon (Eds.), *Future directions for scientific advice in Whitehall* (pp. 22-31). Cambridge, Centre for Science and Policy.

Benjamin, W. (1938/2003). The Paris of the Second Empire in Baudelaire. In H. Eiland & M. Jennings (Eds.), *Walter Benjamin: Selected Writings* (Vol. 4, pp. 3-94). Cambridge MA: Belknap Press.

Bennis, W., & Nanus, B. (1985). *Leaders: Strategies for taking charge*: Harper & Row.

Bennis, W., & Thomas, R. (2002). Crucibles of leadership. *Harvard Business Review, 80*(9), 39-45.

Bentley, M. (2012). *The Role of Military Forces in Disaster Response: Remove the Impediments.* (Master of Strategic Studies), US Army War College, Carlisle, PA.

Berariu, R., Fikar, C., Gronalt, M., & Hirsch, P. (2015). Understanding the impact of cascade effects of natural disasters on disaster relief operations. *International Journal of Disaster Risk Reduction, 12*, 350-356.

Bergen, K. (2006). FAA honors Gulf Coast airport with Safety Award [Press release]

Berlin, J., & Carlstrom, E. (2011). Why is collaboration minimised at the accident scene? *Disaster Prevention and Management, 20*(2), 159-171.

Berlin, J., & Carlstrom, E. (2015). Collaboration Exercises: What Do They Contribute? – A Study of Learning and Usefulness. *J of Contingencies and Crisis Management, 23*(1), 11-23.

Bernstein, D. (2010). Rethinking the Physician's duty in disaster care. *American Medical Association Journal of Ethics (Virtual mentor), 12*(6), 460-465.

Best, E., Bundy, S., Hackerott, C., Hewett, P., Greer, A., Jensen, J., . . . Sevison, T. (2015). Statement of the Emergency Management Doctoral Degree Holder/Seeker Focus Group October 2015. FEMA: Institute of Emergency Management.

Bevc, C. A. (2010). Emotional Dimensions of Conducting Research in Disaster Settings: A Note on Social Psychological Considerations. *Journal of Applied Social Science, 4*(2), 33-42.

Bhandari, R., Owen, C., & Trist, C. (2015). Incident management approaches above the incident management team level in Australia. *Homeland Security & Emergency Management, 12*(1), 101-119.

Bharosa, N., Janssen, M., & Tan, Y.-H. (2011). A research agenda for information quality assurance in public safety networks: information orchestration as the middle ground between hierarchical and netcentric approaches. *Cogn Tech Work, 13*, 203-216.

Bier, V. (2006). Hurricane Katrina as a Bureaucratic Nightmare. In R. Daniels, Kettle, DF & Kunreuther, H, (Ed.), *On Risk and Disaster* (pp. 243-254). Philadelphia: University of Pennsylvania Press.

Biggs, D., Biggs, R., Dakos, V., Scholes, R., & Schoon, M. (2011). Are we Entering an Era of Concatenated Global Crises? *Ecology and Society, 16*(2), 27.

Bigley, G., & Roberts, K. (2001). The Incident Command System: high reliability and organising for complex and volatile task environments. *Academy of Management Journal, 44*(6), 1281-1300.

Birkbak, A. (2012). *Crystallizations in the blizzard: contrasting informal emergency collaboration in Facebook groups*. Paper presented at the NordiCHI'12, Copenhagen.

Birkler, J., Alkire, B., Button, R., Lee, G., Raman, R., Schank, J., & Stephens, C. (2004). The US Coast Guard's Deepwater Force Modernization Plan *Can it be accelerated? Will it meet changing security needs?* Santa Monica CA: RAND (3.6.17): http://www.rand.org/content/dam/rand/pubs/monographs/2004/RAND_MG114.pdf

Birkmann, J., Buckle, P., Jaeger, J., Pelling, M., Setiadi, N., Garschagen, M., . . . Kropp, J. (2010). Extreme events and disasters: a window of opportunity for change? Analysis of organizational, institutional and political changes, formal and informal responses after mega-disasters. *Natural Hazards, 55*(3), 637-655.

BIS. (2010). Principles of scientific advice to government. London: Department for Business Innovation & Skills.

Black, M., & Sutila, T. (1994). *Mega-slums: The Coming Sanitary Crisis: a WaterAid Report*: WaterAid.

Blackburn, S., & Marques, C. (2013). Mega-urbanisation on the coast. In M. Pelling & S. Blackburn (Eds.), *Megacities and the Coast* (pp. 1-21). Oxford: Routledge.

Blanchard, W. (2005). Catastrophe versus disaster - top ten added/expanded dimensions. Unpublished draft: FEMA (3.6.17) https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Ftraining.fema.gov%2Fhiedu%2Fdocs%2Fhazdem%2Fappendix%2520-%2520catastrophe%2520versus%2520disaster.doc

Blanchard, W. (2008a). Guide to Emergency Management and Related Terms, Definitions, Concepts, Acronyms, Organizations, Programs, Guidance & Legislation. FEMA: (3.6.17) http://www.training.fema.gov/hiedu/docs/select%20em-related%20terms%20and%20definitions.doc.

Blanchard, W. (2008b). FEMA Emergency Management Higher Education Program Description; background, current status, and future planning. D of Homeland Security.

Bland, M. (1995). The Crisis Checklist. In C. Doeg (Ed.), *Crisis Management in the Food and Drinks Industry*. London: Chapman and Hall.

Blass, E., & Woods, P. (2012). Introduction: Futures of university learning. *Futures, 44*((Education)), 117-118.

Blass, E., Jasman, A., & Shelley, S. (2010). Visioning 2035: The future of the higher education sector in the UK. *Futures, 42*(5), 445-453.

Blick, A. (2014). Emergency powers and the withering of the Royal Prerogative. *The International Journal of Human Rights, 18*(2), 195-210.

Blitz, B. (2014). Location Security and Environmental-Induced Displacement: A Case Study of the Riverine Islands in Bangladesh. *Refuge, 29*(2), 63-73.

Bluestein, G. (2005, 7.9.2005). Firefighters stuck in Ga. awaiting orders. *Associated Press*.

Blum, S. (2005). *Defense Department Briefing on Ongoing National Guard Response to Hurricane Katrina*, US Department of Defense.

Blum, S., & Scherling, T. (2005). *Defense Department Briefing on DoD Response to Hurricane Katrina*. US Department of Defense: (3.6.17) http://www.globalsecurity.org/military/library/news/2005/08/mil-050831-dod04.htm

Boal, J. (2006). Airport was key to Survival, Despite Damage, following Katrina, *KSL*.

Boe, O. (2016). Building Resilience: The Role of Character Strengths in the Selection and Education of Military Leaders. *International Journal of Emergency Mental Health and Human Resilience, 17*(4), 714-716.

Boehm, A., Enoshm, G., & Michal, S. (2010). Expectations of Grassroots Community Leadership in Times of Normality and Crisis. *J of Contingencies and Crisis Management, 18*(4), 184-194.

Boersma, K., Comfort, L., Groenendaal, J., & Wolbers, J. (2014). Incident command systems: a dynamic tension among goals, rules and practice. *Journal of Contingencies and Crisis Management, 22*(1), 1-4.

Bohn, M. (2004). *The Achille Lauro Hijacking: Lessons in the Politics and Prejudice of Terrorism*. Washington DC: Potomac Books.

Boin, A. (2004). Lessons from Crisis Research. *International Studies Review, 6*(The Forum), 165-174.

Boin, A. (2008). Environmental Crises and Disasters: Producing research that matters. *Risk and Regulation*.

Boin, A. (2009). Editorial: Meeting the Challenges of Transboundary Crises: Building Blocks for Institutional Design. *J of Contingencies and Crisis Management, 17*(4), 203-205.

Boin, A. (2012). *Thinking the Unthinkable: The limits of traditional crisis management and new approaches to crisis preparation and crisis responses*. Paper presented at the OECD Workshop on Inter-Agency Crisis Management 28.6.2012, Geneva.

Boin, A., & Bynander, F. (2015). Explaining success and failure in crisis coordination. *Geografiska Annaler: Series A, Physical Geography, 97*(1), 123-135.

Boin, A., & Lagadec, P. (2000). Preparing for the future: critical challenges in crisis management. *J of Contingencies and Crisis Management, 8*(4), 185-191.

Boin, A., & Rhinard, M. (2008). Managing transboundary crises: what role for the European Union? *International Studies Review, 10*, 1-26.

Boin, A., Kuipers, S., & Overdijk, W. (2013). Leadership in Times of Crisis: A Framework for Assessment. *International Review of Public Administration, 18*(1).

Boin, A., McConnell, A and 't Hart, P. (Ed.) (2007). *Governing after Crisis: The Politics of Investigation, Accountability and Learning*: Cambridge University Press.

Boin, A., 'T Hart, P., McConnell, A., & Preston, T. (2010). Leadership Style, Crisis Response and Blame Management: The Case of Hurricane Katrina. *Public Administration, 88*(3), 706-723.

Boin, A., 't Hart, P., Stern, E., & Sundelius, B. (2005). *The Politics of Crisis Management: Public Leadership under Pressure*: Cambridge University Press.

Boin, A. (2005). From crisis to disaster: towards an integrative perspective. In D. Perry & E. L. Quarantelli (Eds.), *What is a Disaster: New Answers to Old Questions* (pp. 153-172). International Research Committee on Disasters: Xlibris.

Bolden, R. (2011). Distributed Leadership in Organizations: A Review of Theory and Research. *International Journal of Management Reviews, 13*(251-269).

Boote, D., & Beile, P. (2005). Scholars Before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation. *Educational Researcher, 34*(6), 3-15.

Borodzicz, E. (2004). The missing ingredient is the value of flexibility. *Simulation & Gaming, 35*(3), 414-426.

Borodzicz, E. (2005). *Risk, Crisis & Security Management*. Chichester: Wiley.

Borodzicz, E., & van Haperen, K. (2002). Individual and group learning in crisis simulations. *J of Contingencies and Crisis Management, 10*(3), 139-147.

Bosworth, S. L., & Kreps, G. A. (1986). Structure as Process: Organization and Role. *American Sociological Review, 51*(5), 699-716.

Boto, I., & Biasca, R. (2012). *Briefing no. 27 - Small Island Economies: from Vulnerabilities to Opportunities*. Brussels: Technical Centre for Agricultural and Rural Cooperation ACP-EU.

Bowman, S., & Willis, C. (2003). We Media: How audiences are shaping the future of news and information: The American Press Institute.

Bowman, S., Kapp, L., & Belasco, A. (2005). Hurricane Katrina: DOD Disaster Response. Washington DC: (3.6.17) http://fas.org/sgp/crs/natsec/RL33095.pdf.

Bradfield, R., Cairns, G., & Wright, G. (2015). Teaching scenario analysis—An action learning pedagogy. *Technological Forecasting and Social Change, 100*(Supplement C), 44-52.

Bradshaw, L., & Slonsky, L. (2005, 7.9.2005). Trapped in New Orleans by the Flood -- and martial law. *Socialist Worker*.

Brennan, M. A., & Flint, C. G. (2007). Uncovering the hidden dimensions of rural disaster mitigation: Capacity building through community emergency response teams. *Southern Rural Sociology, 22*(2), 111-126.

Briggs, R. (1982). *When the Wind Blows*. London: Penguin.

Briggs, R. (Ed.) (2002). *The Unlikely Counter-Terrorists*. London: The Foreign Policy Centre.

Brinkley, D. (2006). *The Great Deluge: Hurricane Katrina, New Orleans, and the Mississippi Gulf Coast*. New York: Harper Perenial.

Briske, D., Washington-Allen, R., Johnson, C., Lockwood, J., Lockwood, D., Stringham, T., & Shugart, H. (2010). Catastrophic thresholds: a synthesis of concepts, perspectives, and applications. *Ecology and Society, 15*(3), 37.

British Geological Survey http://www.earthquakes.bgs.ac.uk/education/faqs/faq15.html

Britton, N. (1988). Organised behaviour in disaster: a review essay. *Int J of Mass Emergencies and Disasters, 6*(3), 363-395.

Britton, N. (1999). Whither the emergency manager? *Int J of Mass Emergencies and Disasters, 17*(2), 223-235.

Britton, N. (2004). *Higher Education in Emergency Management: What is Happening Elsewhere?* Paper presented at the 7th Annual Emergency Management Higher Education Conference, Emmetsburg USA.

Britton, N., & Lindsay, J. (2005). *Designing Educational Opportunities for the Emergency Management Professional of the 21st Century: Formulating an Approach for a Higher Education Curriculum*. Paper presented at the 2005 Higher Education Conference, US National Emergency Training Centre, Emisberg MD.

Brodie, B. (1949). Strategy as a Science. *World Politics, 1*(04), 467-488.

Brookes, S. (2008). *Responding to the New Public Leadership Challenge*. Paper presented at the Herbert Simon 2nd Annual Conference, Manchester April 2008.

Brookes, S., & Grint, K. (Eds.). (2010). *The New Public Leadership Challenge*: Palgrave Macmillan.

Brooks, J. M., Bodeau, D., & Fedorowicz, J. (2010). Network management in emergency response: articulation practices of state-level managers—interweaving up, down, and sideways. *Administration & Society, 45*(8), 911-948.

Brooks, D. (2005, 8.9.2005). Katrina's Silver Lining. *New York Times,* p. A29.

Broughton, E. (2005). The Bhopal disaster and its aftermath: a review. *Environmental Health, 4*(1), 6.

Brouillette, J., & Quarantelli, E. L. (1971). Types of Patterned Variation in Bureaucratic Adaptations to Organizational Stress. Ohio State University: Disaster Research Centre.

Brown, K. L. (2015). Assessing the Educational Needs of Emergency Management Personnel. *Journal of Homeland Security Education, 4*, 1.

Brown, M. (2005) *Ted Koppel interviews FEMAs Mike Brown/Interviewer: T. Koppel*. ABC Newsnight: (3.6.17) https://m.youtube.com/watch?v=jKtuTV3hNdM

Bruncard, J., Namulanda, G., & Ratard, R. (2008). Hurricane Katrina Deaths, Louisiana, 2005. *Disaster Medicine and Public Health Preparedness, 2*(4), 215-223.

Bruner, J. (1996). *The process of education*. Cambridge, MA: Harvard University Press.

Bruns, A. (2013). The environmental impacts of megacities on the coast. In M. Pelling & S. Blackburn (Eds.), *Megacities and the Coast*: Routledge.

BSI. (2011). PAS 200: 2011. Crisis management. Guidance and good practice. London: British Standards Institution.

Buchanan, D., & Denyer, D. (2013). Researching Tomorrow's Crisis: Methodological Innovations and Wider Implications. *Int J of Management Reviews, 15*, 205-224.

Buck, D., Trainor, J., & Aguirre, B. (2006). A Critical Evaluation of the Incident Command System and NIMS. *Journal of Homeland Security and Emergency Management, 3*(3).

Budescu, D. V., Por, H.-H., Broomell, S. B., & Smithson, M. (2014). The interpretation of IPCC probabilistic statements around the world. *Nature Climate Change, 4*(6), 508-512.

Buhaug, H., Gleditsch, N., & Theisen, O. (2008). *Implications of climate change for armed conflict*. Paper presented at the Social Dimensions of Climate Change, World Bank, Washington DC.

Buhaug, Halvard; & Henrik Urdal (2009) Will Climate Change Lead to more Urban Violence? Urbanization, Urban Environmental Problems, and Social Disorder in Cities, presented at 50th Annual Convention of the International Studies Association, New York, NY, 15–18 February.

Bui, T. X., & Sebastian, I. (2011). Beyond Rationality: Information Design for Supporting Emergent Groups in Emergency Response. In F. Burstein, P. Brézillon, & A. Zaslavsky (Eds.), *Supporting Real Time Decision-Making: The Role of Context in Decision Support on the Move* (pp. 159-179). Boston, MA: Springer US.

Buncefield Major Incident Investigation Board (2007). Recommendations on the emergency preparedness for, response to and recovery from incidents. London: Health and Safety Commission.

Buncefield Major Incident Investigation Board (2011). The Buncefield Incident 11 December 2005: The final report of the Major Accident Investigation Board. London: Health and Safety Commission.

Burby, R. (2006). Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing About Wise Governmental Decisions for Hazardous Areas. *Annals AAPSS, 604*, 171-191.

Burgess, H., Sieminski, S., & Arthur, L. (2006). *Achieving Your Doctorate in Education*. London: Sage.

Burke, M., Hsiang, S., & Miguel, E. (2015). Climate and conflict. *Annual Review of Economics, 7*, 577-617.

Burke, R. (2006, 28.2.2006). New Orleans Fire Department Hazmat response following Katrina. *Firehouse*.

Burke, R. (2015). *The dual status commander and hurricane Sandy: maturing military response with process improvement.* (PhD), University of Delaware.

Burkle, F. (1999). Lessons learnt and future expectations of complex emergencies. *British Medical Journal, 319*(7207), 422–426.

Burkle, F., & Hayden, R. (2001). The concept of assisted management of large-scale disasters by horizontal organisations. *Prehospital and Disaster Medicine, 16*(3), 87-96.

Burnett, J. (2005, 20.9.2005). Evacuees were turned away at Gretna, La. *Morning Edition*.

Burns, J. (2003). *Transforming Leadership: A New Pursuit of Leadership*. New York: Atlantic Monthly Press.

Burns, J. (2005). Leadership. *Leadership, 1*(1), 11-12.

Burns, P., & Thomas, M. (2006). The failure of the nonregime: how Katrina exposed New Orleans as a regimeless city. *Urban Affairs Review, 41*(4), 517-527.

Busch, N., & Givens, A. (2013). Achieving resilience in disaster management: the role of public-private partnerships. *Journal of Strategic Security, 6*(2), 1-19.

Bush, President G. W. (2005). 'We will do what it takes' *Speech at Jackson Square, New Orleans 16.9.2005*. Transcript: CNN.

Butler, D. (2008). Crossing the valley of death. *Nature, 453*(12.6.2008), 840-842.

Butts, C., Acton, R., & Marcum, C. (2012). Interorganizational collaboration in the Hurricane Katrina response. *J of Social Structure, 13*, 1-36.

Buzna, L., Peters, K., Ammoser, H., Kuhnert, C., & Helbing, D. (2007). Efficient response to cascading disaster spreading. *Physical Review, 75*(056107).

Cabinet Office. (2001). The Future of Emergency Planning in England and Wales: A Discussion Document. London: TSO.

Cabinet Office. (2004). The Lead Government Department and its role – Guidance and Best Practice. London: HMSO.

Cabinet Office. (2005). Civil Contingencies Act 2004: A Short Guide (revised). London: TSO.

Cabinet Office. (2006). Hurricanes Katrina and Rita: A Perspective: Cabinet Office Civil Contingencies Secretariat.

Cabinet Office. (2010). UK Central Government Arrangements for Responding to an Emergency. London: Cabinet Office.

Cabinet Office. (2011a). The Lead Government Department and its role – Guidance and Best Practice. London, Civil Contingencies Secretariat: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61355/lead-government-departments-role.pdf

Cabinet Office. (2011b). Strategic National Framework on Community Resilience. London: Cabinet Office.

Cabinet Office. (2012a). Emergency Response and Recovery: Non-statutory guidance accompanying the Civil Contingencies Act 2004. London: Cabinet Office.

Cabinet Office. (2012b). Enhanced SAGE Guidance: A strategic framework for the Scientific Advisory Group for Emergencies (SAGE). London: Civil Contingencies Secretariat.

Cabinet Office. (2013a). Expectations and Indicators of Good Practice Set for Category 1 and 2 Responders, *The Civil Contingencies Act (2004), its associated Regulations*

(2005) and guidance, the National Resilience Capabilities Programme, and emergency response and recovery. London: Cabinet Office Civil Contingencies Secretariat.

Cabinet Office. (2013b). 2010 to 2015 government policy: emergency response planning. DCLG First published:20 February 2013, last updated: 8 May 2015: (3.6.17) https://www.gov.uk/government/publications/2010-to-2015-government-policy-emergency-response-planning.

Cabinet Office. (2013c). Emergency Response and Recovery: Non-statutory guidance accompanying the Civil Contingencies Act 2004. London: Cabinet Office.

Cabinet Office. (2013d). Lexicon of UK civil protection terminology. Cabinet Office: https://www.gov.uk/government/publications/emergency-responder-interoperability-lexicon

Cabinet Office. (2013e). Responding to Emergencies: The UK Central Government Response: Concept of Operations. London: Cabinet Office Civil Contingencies Secretariat.

Cabinet Office. (2015a). National Security Strategy and Strategic Defence and Security Review 2015: A Secure and Prosperous United Kingdom. London: HMSO.

Cabinet Office. (2015b). 2010 to 2015 government policy: emergency planning. DCLG 2013, republished 8 May 2015: (3.6.17) https://www.gov.uk/government/publications/2010-to-2015-government-policy-emergency-planning/2010-to-2015-government-policy-emergency-planning

Cabinet Office. (2016). Community resilience framework for practitioners. London, Cabinet Office Civil Contingencies: (3.6.17) https://www.gov.uk/government/publications/community-resilience-framework-for-practitioners

Cabinet Office. (2016b). Community Emergency Plan Toolkit. London: Cabinet Office.

Cabinet Office. (2017a). National Risk Register of Civil Emergencies.

Canney, D. (2010). *In Katrina's Wake: The U.S. Coast Guard and the Gulf Coast Hurricanes of 2005*. Gainesville FL: University Press of Florida.

Carafano, J., & Keith, L. (2006). Learning Katrina's lessons: Coast Guard modernisation is a must. *Backgrounder, July* (No. 1950).

Carlton, S., & Vallance, S. (2013). An inventory of community-led and Non-Governmental Organisations and initiatives in post-earthquake Canterbury. Lincoln University NZ: Unpublished.

Carpenter, S., & Kent, R. (2015). The military, the private sector and traditional humanitarian actors. In S. Carpenter, R. Kent, Z. Sezgin, & D. Dijkzeul (Eds.), *The New Humanitarians in International Practice: Emerging Actors and Contested Principles* (pp. 144).

Carr, D. (2005, 19.9.2005). More horrible than truth: news reports. *New York Times*.

Carrel, L. (2000). Training Civil Servants for Crisis Management. *J of Contingencies and Crisis Management, 8*(4), 192-196.

Carter, F. (2005, 21.9.2005). Interview: Dumas Carter, NOPD. *City Pages*.

Casto, C. (2014). *Crisis Management: A Qualitative Study of Extreme Event Leadership.* (DBA), Kennesaw State University, GA.

Cave, M. (2007). Through Hell and High Water: Hurricane Katrina's First Responders Provide Eyewitness Accounts. *Archival Outlook, November/December*.

Cave, M. (2008). Through Hell and High Water: New Orleans, August 29 - September 15, 2005. *Oral History Review, 35*(1), 1-10.

CDC. (2014). Crisis and Emergency Risk Communication. Atlanta USA: Center for Disease Control and Prevention.

Chido, D. (2016). Alternative Governance Structures in Megacities: Threats or Opportunities? Strategic Studies Institute: US Army War College.

CIA. (2015). *World Factbook*. Washington DC: Central Intelligence Agency, US State Department.

Cigler, B. (2007). The "Big Questions" of Katrina and the 2005 Great Flood of New Orleans. *Public Administration Review, December 2007 Special Issue*, 64-76.

Cisin, I., & Clark, W. (1962). The Methodological Challenge of Disaster Research. In G. Baker & D. Chapman (Eds.), *Man and Society in Disasters* (pp. 23-53). New York: Basic Books.

Clammer, J. (2012). The Sociology of Complex Disasters *ISA e-Forum*: ISA.

Clark, G. (1997). Secondary data sources. In R. Flowerdew & D. Martin (Eds.), *Methods in Human Geography* (pp. 57-69): Longman.

Clark, T. (2002). New Labour's Big Idea: Joined-up Government. *Social policy and Society, 1*(2), 107-117.

Clarke, L. (1999). *Mission Improbable: Using Fantasy Documents to Tame Disaster*: University of Chicago Press.

Clarke, L. (2008). Thinking about Worst-Case Thinking. *Sociological Inquiry, 78*(2), 154-161.

Clarke, R. (1986). *London under Attack: The Report of the Greater London Area War Risk Study Commission*. London: Basil Blackwell.

Coast 2050 Planning Management Team. (1998). Coast 2050: Toward a Sustainable Coastal Louisiana. Baton Rouge, Louisiana Department of Natural resources: (3.6.17)

http://www.preventionweb.net/files/13193_Coast2050TowardasustainablecoastalL.pdf

Coates, S., & Eggen, D. (2005, 2.9.2005). A City of despair and Lawlessness. *The Washington Post*.

Cobb, J. (2015) *Flood of Lies: The St Rita's Nursing Home Tragedy*: Pelican.

Cocking, C. (2013). The role of "zero-responders" during 7/7: implications for the emergency services. *International Journal of Emergency Services, 2*(2), 79-93.

Cohen, B. (1988). The ethics of using medical data from Nazi experiments: Jewish Law.

Colby, E. (2005). What Happened and Why at the Gretna Bridge. *Columbia Journalism Review, 21.9.2005*(Online).

College of Policing. (2016). Public Order Command Authorised Professional Practice: https://www.app.college.police.uk/app-content/public-order/command/

College of Policing. (undated). Casualty Bureau: (3.6.17) https://www.app.college.police.uk/app-content/civil-emergencies/casualty-bureau/

Collins, S (2006) The tripartite approach to business continuity in the UK financial sector, *J of Business Continuity & Emergency Planning*, 1 (2).

Comer, D. (2010). Special issue: Crisis management education. *J of Management Education, 34*(5), 782-783.

Comer, D. (2013). Educating Students to Prepare for and Respond to Crises that affect Organisations: An Introduction to the Special Issue. *J of Management Education, 37*(1), 3-5.

Comfort, L. (2006). Cities at Risk: Hurricane Katrina and the Drowning of New Orleans. *Urban Affairs Review, 41*(4), 501-516.

Comfort, L. (2007). Crisis Management in Hindsight: Cognition, Communication, Coordination, and Control. *Public Administration Review, Special Issue* (December 2007), 189-197.

Comfort, L. K. (2005). Fragility in Disaster Response: Hurricane Katrina, 29 August 2005. *The Forum, 3*(3).

Comfort, L., & Hasse, T. (2006). Communication, Coherence and Collective Action: The Impact of Hurricane Katrina on Communications Infrastructure. *Public Works Management & Policy, 11*(1), 1-16.

Comfort, L., & Okada, A. (2013). Emergent leadership in extreme events: a knowledge commons for sustainable communities. *Int Review of Public Administration, 18*(1), 61-76.

Comfort, L., & Wukich, C. (2013). Developing decision-making skills for uncertain conditions: the challenge of educating effective emergency managers. *J of Public Affairs Education, 19*(1), 53-71.

Comfort, L., Birkland, T., Cigler, B., & Nance, E. (2010). Retrospectives and Prospectives on Hurricane Katrina: Five Years and Counting. *Public Administration Review, September - October 2010*, 669-678.

Comfort, L., Boin, A., & Demchak, C. (Eds.). (2010). *Designing Resilience: Preparing for Extreme Events*: University of Pittsburgh Press.

Comfort, L., Ko, K., & Zagorecki, A. (2004). Coordination in Rapidly Evolving Disaster Response Systems: The Role of Information. *American Behavioural Scientist, 48*(3), 295-313.

Comfort, L., Oh, N., Ertan, G., & Scheinert, S. (2010). Designing adaptive systems for disaster mitigation and response: the role of structure. In L. Comfort, A. Boin, & C. Demchak (Eds.), *Designing Resilience: Preparing for Extreme Events* (pp. 33-61). University of Pittsburg Press.

Committee on Abrupt Climate Change. (2002). Abrupt Climate Change: Inevitable Surprises: Committee on Abrupt Climate Change, National Research Council (2002).

Coombs, W. T. (2007). *Ongoing Crisis Communication: Planning, Managing, and Responding.* (2nd ed.): Sage.

Coombs, W., & Holladay, S. (Eds.). (2010). *The Handbook of Crisis Communication*. Wiley-Blackwell, Chichester:

Cooper, A., Koch, K., Mattingly, D., Meserve, J., Miles O'Brien, M., Spellman, J., . . . Zarrella, J. (2005). New Orleans shelters to be evacuated: Floodwaters rising, devastation widespread in Katrina's wake. *CNN*.

Cooper, C., & Block, R. (2006). *Disaster: Hurricane Katrina and the Failure of Homeland Security*. New York: Henry Holt & Co.

Cottrell, A. (2010). A survey of spontaneous volunteers. Centre for Disaster Studies, James Cook University: Australian Red Cross.

Crandall, W., Parnell, J., & Spillan, J. (2010). *Crisis Management in the New Strategy Landscape*: Sage.

Crego, J. (2008). The Journey. In L. Alison & J. Crego (Eds.), *Policing Critical Incidents*. Cullompton: Willan Publishing.

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*: Sage.

Cronin, M. A., & Weingart, L. R. (2007). Representational gaps, information processing, and conflict in functionally diverse teams. *Academy of Management Review, 32*(3), 761-773.

Crutzen, P., & Stoermer, E. (2000). The "Anthropocene.". *International Geosphere-Biosphere Programme (IGBP) Newsletter, 41*, 12.

Cruz, A., Steinberg, L., Arellano, A., Nordvik, J., & Pisano, F. (2004). State of the Art in Natech Risk Management. Italy: EC Joint Research Centre.

Cullen The Lord. (1990). Public Inquiry into the Piper Alpha Disaster. London: Cm 1310.

Cunliffe, A. (2004). On Becoming a Critically Reflexive Practitioner. *J of Management Education, 28*(4), 407-426.

Cunliffe, A. (2009). The philosopher leader: on relationalism, ethics and reflexivity - a critical perspective to teaching leadership. *Management Learning, 40*(1), 87-101.

Cunliffe, A. L. (2016). Republication of "On becoming a critically reflexive practitioner". *Journal of management education, 40*(6), 747-768.

Curnin, S., & Owen, C. (2013). *A typology to facilitate multi-agency coordination.* Paper presented at the 10th International ISCRAM Conference – May 2013, Baden-Baden, Germany.

Curnin, S., Owen, C., & Trist, C. (2014). Managing the constraints of boundary spanning in emergency management. *Cognition, Technology & Work, 16*(4), 549-563.

Curnin, S., Owen, C., Paton, D., & Brooks, B. (2015). A theoretical framework for negotiating the path of emergency management multi-agency coordination. *Applied Ergonomics, 47*, 300-307.

Curnin, S., Owen, C., Paton, D., Trist, C., & Parsons, D. (2015). Role clarity, swift trust and multi-agency coordination. *J of Contingencies and Crisis Management, 23*(1), 29-41.

Curtain, T. (2005). *Managing a Crisis: A Practical Guide*: Palgrave MacMillan.

Cutter, S. (2011). CS1 The Katrina exodus: internal displacements and unequal outcomes *Migration and Global Environmental Change*. London: UK Foresight Project: Government Office for Science.

Cwiak, C. (2009). Emergency Management Education: A Snapshot of the Community *2009 FEMA Emergency Management Higher Education Program Report*. North Dakota State University: Department of Sociology, Anthropology and Emergency Management.

Cwiak, C. (2011). Framing the Future: What Should Emergency Management Graduates Know? *Journal of Homeland Security and Emergency Management, 8*(2), Article 14.

Cwiak, C. (2014). Emergency Management Higher Education Today: The 2014 FEMA Higher Education Program Survey. North Dakota State University.

Cwiak, C. (No date). The Pivotal Role of FEMA's Higher Education Program in the Emergency Management Professionalization Process: North Dakota State University.

Dallas, C., & Bell, W. (2007). Prediction Modelling to Determine the Adequacy of Medical Response to Urban Nuclear Attack. *Disaster Med Public Health Preparedness, 1*(2), 80-89.

Daniels, R., Kettle, DF & Kunreuther, H, (Ed.). (2006). *On Risk and Disaster: Lessons from Hurricane Katrina.* Philadelphia: University of Pennsylvania Press.

Darlington, J. (1999). The Profession of Emergency Management: Educational Opportunities and Gaps: Federal Emergency Management Agency.

Davies, M., & Devlin, M. (2010). Interdisciplinary higher education. In M. Davies, M. Devlin, & M. Tight (Eds.), *Interdisciplinary Higher Education: Perspectives and Practicalities* (pp. 3-28): Emerald Group Publishing Limited.

Davis, L., Rough, J., Cecchine, g., Schaefer, A., & Zeman, L. (2007). Hurricane Katrina: Lessons for Army Planning and Operations: RAND Arroyo Center.

Davis, M. (2010). Who will build the ark? *New Left Review, 11*(61), 29-46.

Davis, M. (2011). Coastal restoration and protection and the future of New Orleans. In A. Liu, R. Anglin, R. Mizelle, & A. Plyer (Eds.), *Resilience and Opportunity* (pp. 173-184). Washington DC: Brookings Institution.

Davis, M., & Fontenot, A. (2005, 20.10.05). Hurricane Gumbo. *The Nation*.

Dayton, B. (2004). Editorial: Managing Crises in the Twenty-First Century. *International Studies Review, 6* (The Forum), 165-194.

de Marchi, B., & Funtowicz, S. (1994). General Guidelines for Content of Information to the Public: Directive 82/501/EEC - Annex VII. Luxembourg: EC Directorate-General Xlll: Telecommunications, Information Market and Exploitation of Research.

De Wolde, A., Groenendaal, J., Helsloot, I., & Schmidt, A. (2014). An explorative study on the connection between ethical leadership, prototypicality and organizational misbehaviour in a Dutch fire service. *Int J of Leadership Studies, 8*(2), 18-43.

Deflem, M., & Sutphin, S. (2009). Policing Katrina: Managing Law Enforcement in New Orleans. *Policing, 3*(1), 41-49.

Deichmann, R. (2008). *Code Blue: A Katrina Physician's Memoir*. Bloomington IN: iUniverse.

Delpech, T. (2012). *Nuclear Deterrence in the 21st Century: Lessons from the Cold War for a new era of Strategic Piracy*. Santa Monica CA: Rand Corporation.

Denzin, N. (1989). *Interpretive Biography*: Sage.

Denzin, N., & Lincoln, Y. (2000). Introduction: The discipline and practice of qualitative research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of Qualitative Research*. Thousand Oaks: Sage.

Desai, G. (2005). Member to member: In the aftermath of Hurricane Katrina. *Modern Language Association Newsletter, Winter*, 5-6.

Deverell, E. (2012a). Investigating the roots of crisis management studies and outlining future trajectories for the field. *J of Homeland Security and Emergency Management, 9*(1).

Deverell, E. (2012b). Is best practice always the best? Learning to become better crisis managers. *J of Critical Incident Analysis, 2012*(Fall), 26-40.

Devitt, K. (2009). *Going for Gold: A Study on Effective Strategic Leadership in Multi-Agency Major Incident Response Teams.* (PhD), Portsmouth.

Devitt, K., & Borodzicz, E. (2008). Interwoven Leadership: the missing link in multi-agency major incident response. *J of Contingencies and Crisis Management, 16*(4), 208-216.

Dickinson, C. (2006). Lessons from Katrina. Washington DC: FEMA US Fire Administration.

Di Leva, C., & Morita, S. (2008). Maritime Rights of Coastal States and Climate Change: Should States Adapt to Submerged Boundaries? The World Bank.

Dodge, J., Ospina, S. M., & Foldy, E. G. (2005). Integrating rigor and relevance in public administration scholarship: The contribution of narrative inquiry. *Public Administration Review, 65*(3), 286-300.

Dolan, T. (2010). Revisiting adhocracy: from rhetorical revisionism to smart mobs. *Journal of Future Studies, 15*(2), 33-50.

Dolina, L. (2005, 24.10.2005). Katrina: The Untold Story. *National Review,* pp. 35-39.

Dolk, D., & Euske, K. (1994). Model integration: Overcoming the stovepipe organization. *Advances in Management Accounting, 3*, 197-212.

Donahue, D., Cunnion, S., Balaban, C., & Sochats, K. (2010). Meeting educational challenges in Homeland Security and Emergency Management. *J of Homeland Security and Emergency Management, 7*(1), Article 19.

Donlon, J., & Donlon, J. (2008). Government gives tradition the go-ahead: The Atchafalaya Welcome Center's Role in Hurricane Katrina Recovery. *Louisiana Folklore Miscellany, 16-17*, 36-44.

Donlon, J., & Donlon, J. (2014). Government Gives Tradition the Go-Ahead: The Atchafalaya Welcome Center's Role in Hurricane Katrina recovery. In B. Ancelet , M. Gaudet, & C. Lindahl (Eds.), *Second Line Rescue* (pp. 53-61): University of Mississippi Press.

Dorn, B., & Zeller, R. (2011). Greater Bay Area Meta-Leadership Summit for Preparedness. National Preparedness Leadership Initiative:

http://www.cdcfoundation.org/sites/default/files/upload/pdf/PresenterSlides.pdf.

Dory, A. (2003). American Civil Security: the US Public and Homeland Security. *The Washington Quarterly, 27*(1), 37-52.

Doward, J. (2001, Sunday 11.08.2001). Blair tells Bush, back off UK plc. *The Observer*. Retrieved from http://www.theguardian.com/business/2002/aug/11/globalisation.news

Dowd, M. (2005, 3.9.2005). United States of Shame. *New York Times*. Retrieved from (3.6.17) http://www.nytimes.com/2005/09/03/opinion/united-states-of-shame.html

Doyle, C., & Elsea, J. (2012). The Posse Comitatus Act and related matters: The use of the military to execute civilian law. Congressional Research Service, Washington DC: (3.6.17) http://fas.org/sgp/crs/natsec/R42659.pdf

Doyle, E. E., Johnston, D. M., McClure, J., & Paton, D. (2011). The communication of uncertain scientific advice during natural hazard events. *New Zealand Journal of Psychology, 40*(4), 39-50.

Doyle, E. E., McClure, J., Paton, D., & Johnston, D. M. (2014). Uncertainty and decision making: volcanic crisis scenarios. *International Journal of Disaster Risk Reduction, 10*, 75-101.

Doyle, E., Paton, D., & Johnston, D. (2015). Enhancing scientific response in a crisis: evidence-based approaches from emergency management in New Zealand. *Journal of Applied Volcanology, 4*(1).

Drabek, T. (1983). Alternative patterns of decision making in emergent disaster response networks. *Int J of Mass Emergencies and Disasters*, 277-305.

Drabek, T. (2004). *Theories relevant to emergency management versus a theory of emergency management*. Paper presented at the Emergency Management Higher Education Conference, Emmitsburg, Maryland: (3.6.17) https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Ftraining.fema.gov%2Femiweb%2Fdownloads%2Fthomas%2520drabek%2520-%2520theories%2520revelant.doc

Drabek, T., & McEntire, D. (2002). Emergent phenomena and multi-organizational coordination in disasters: lessons from the research literature. *Int. J. Mass Emerg. Disasters, 20*(2), 197-224.

Drabek, T., & McEntire, D. (2003). Emergent phenomena and the sociology of disaster: Lessons, trends and opportunities from the research literature. *Disaster Prevention and Management, 12*(2), 97-112.

Drennan, L., & McConnell, A. (2007). *Risk and Crisis Management in the Public Sector*: Routledge.

Dreyfus, H., & Drefus, S. (1986). *Mind over Machine: The Power of Human Intuition and Expertise in the Era of the Computer*. Oxford: Blackwell.

Drury, J., Cocking, C., & Reicher, S. (2009). The nature of collective 'resilience': Survivor reactions to the July 7th (2005) London bombings, 27 (1) 66-95. *International Journal of Mass Emergencies and Disasters, 27*(1), 66-95.

Duderstadt, J. (2009). *Current Global Trends in Higher Education and Research: Their Impact on Europe*. Paper presented at the Dies Academicus 2009, Universitat Wien, Austria.

Dulles, J. F. (1956, January 16). Interview. *Life*.

Dunlap, E., & Golub, A. (2011). Drug markets during the Katrina disaster. *Disaster Prevention and Management, 20*(3), 251-265.

Dunphy, C., & Radel, C. (2009). *Assessment of Local, State and Federal Request Processes for Defense Support to Civil Authorities in the United States.* (MBA), Naval Postgraduate School, Monterey, CA.

Duxbury, J., & Dickinson, S. (2007). Principles for sustainable governance of the coastal zone: In the context of coastal disasters. *Ecological Economics, 63*, 319-330.

Dyer, G. (2011). *Climate Wars: The Fight for Survival as the World Overheats*. Oxford: Oneworld.

Dynes, R. (1970). *Organized Behavior in Disaster*: Heath Lexington Books.

Dynes, R. (1990). Community emergency planning: false assumptions and inappropriate analogies. University of Delaware, Disaster Research Center: (3.6.17) http://udspace.udel.edu/bitstream/handle/19716/517/PP145.pdf?sequence=3&isAllowed=y

Dynes, R., & Aguirre, B. (1976). Organisational adaptation to crises: mechanisms of coordination and structural change *Preliminary Paper 29*. University of Delaware: Disaster Research Centre.

Dynes, R., & Drabek, T. (1994). The structure of disaster research: its policy and disciplinary implications. *Int J of Mass Emergencies and Disasters, 12*, 5-23.

Dynes, R., & Quarantelli, E. L. (1977). Helping behaviour in large scale disasters: a social organisational approach *Preliminary Paper 48*. University of Delaware Disaster research Centre.

Dynes, R., & Rodriquez, H. (2007). Finding and framing Katrina: the social construction of disaster. In D. Brunsma, D. Overfelt, & J. S. Picou (Eds.), *The Sociology of Katrina*: Rowman & Littlefield.

Dynes, R., Quarantelli, E. L., & Kreps, G. (1972). A Perspective on Disaster Planning. University of Delaware: Disaster Research Centre.

Dyson, J. (1987). *Accounting for Non-Accounting Students*. London: Pitman.

Dyson, M. (2006). *Come Hell or High Water: Hurricane Katrina and the Colour of Disaster*. New York: Basic Civitas Books.

EC. (1982). Council Directive of 24th June 1982 on major accident hazards of certain industrial activities: 82/501/EEC. Brussels: European Commission.

EC. (2001). Council Decision: establishing a Community mechanism to facilitate reinforced cooperation in civil protection assistance interventions 2001/792/EC (Vol. L297 15.11.2001 7-11). Brussels: Official Journal of the European Union.

EC. (2005). Communication: Reinforcing EU Disaster and Crisis Response in Third Countries COM(2005)153. Brussels: European Commission.

EC. (2007). Treaty of Lisbon: amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007. Brussels, European Commission.

EC. (2008b). Climate change and human security: a challenging environment of injustice *A Report by the Mission and Public Affairs Council*. Brussels, European Commission

EC. (2010). European Interoperability Framework (EIF) for European public services, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions 'Towards interoperability for European public services'* Brussels, European Commission

EC. (2012a). Council conclusions on improving civil protection through lessons learnt: 3162nd Justice and Home Affairs Council meeting, 26 and 27 April 2012. Luxembourg: European Commission.

EC. (2012b). Directive 2012/18/EU of The European Parliament and of The Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC. Brussels: European Commission.

EC. (2014a). Communication: The post 2015 Hyogo Framework for Action: Managing risks to achieve resilience *COM(2014) 216 final*. Brussels: European Commission.

EC. (2014b). EU Policies contributing to Disaster Risk Management SWD (2014) 133 final. Brussels: European Commission.

EC. (2014c). Overview of natural and man-made disaster risks in the EU *SWD (2014) 134 final*. Brussels: European Commission.

EC. (2016). The Union Civil Protection Mechanism Training Programme. Luxembourg, EU: DG ECHO
http://ec.europa.eu/echo/files/civil_protection/civil/prote/pdfdocs/Training%20brochure.pdf

ECHR. (1950, 2002). Convention for the Protection of Human Rights and Fundamental Freedoms. Rome: (3.6.17)
http://www.echr.coe.int/Documents/Convention_ENG.pdf.

Eckberg, D., & Hill, L. (1979). The paradigm concept and sociology: a critical review. *American Sociological Review, 44*(December), 925-937.

Ehrlich, P., & Ehrlich, A. (2013). Can a collapse of global civilisation be avoided? *Proceedings of the Royal Society, B*(280: 20122845).

Eikenberry, A., Arroyave, V., & Cooper, T. (2007). Administrative Failure and the International NGO Response to Hurricane Katrina. *Public Administration Review, Special Issue* (December 2007), 160-170.

Einck, A. (2005). The Call of Duty: LDWF search and rescue. *Louisiana Conservationist, November/December,* 4-11.

Elliott, D., & Macpherson, A. (2009). *Policy and Practice: Recursive Learning from Crisis*. Paper presented at the OLKC Conference, Amsterdam.

Emergency Planning Society. (2008). *Core Competencies Framework*. London: Emergency Planning Society.

Emergency Services Collaboration Working Group. (2015). Emergency Services Collaboration: The Current Picture. London: (3.6.17) http://www.apccs.police.uk/wp-content/uploads/2013/11/Emergency-Services-Collaboration-2014.pdf.

Endter-Wada, J., & Ingram, H. (2012). Global climate change as environmental mega-crisis. In I. Helsloot, A. Boin, B. Jacobs, & L. Comfort (Eds.), *Mega-Crises* (pp. 300-318). Sprinfield USA: Charles Thomas.

Engel, K., Kolen, B., Most, H. v. d., & Ruiten, K. v. (2012). The Dutch Delta: A Mega-Crisi Waiting to Happen? In I. Helsloot, A. Boin, B. Jacobs, & L. Comfort (Eds.), *Mega-Crisis*. Springfield, Illinois USA: Charles C Thomas Ltd.

Engledow, M. (2009). *Tough Questions? Tough Decisions? Is there a need to enhance the role of the private sector in emergencies?* (MSc), University of Hertfordshire.

ENQA. (2015). Cooperation in cross-border Higher Education: a toolkit for quality assurance agencies. Brussels: European Association for Quality Assurance in Higher Education.

Erikson, K., & Peek, L. (2011). *Hurricane Katrina Research Bibliography*: Task Force on Hurricane Katrina and the Rebuilding the Gulf Coast: (3.6.17) http://www.preventionweb.net/files/2751_KatrinaBibliography.pdf

Etzioni, A. (1964). *Modern Organisations*. Eaglewood Cliffs, NJ: Prentice-Hall.

EU FRONTEX. (2017). Annual Risk Analysis. Warsaw, Poland: European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union.

Eugene, N. (2013). Bridges of Katrina: Three Survivors, One Interview. In B. Ancelet, M. Gaudet, & C. Lindahl (Eds.), *Second Line Rescue: Improvised Responses to Katrina and Rita* (pp. 127-152). University of Mississippi Press.

Evans, K., Guile, D., Harris, J., & Allan, H. (2010). Putting knowledge to work: A new approach. *Nurse Education Today, 30*(3), 245-251.

Everytown for Gun Safety. (2014). *Analysis of mass shootings:* (3.6.17)
http://everytownresearch.org/reports/mass-shootings-analysis/

Faber, M., Giuliani, L., Revez, A., Jayasena, S., Sparf, J., & Mendez, J. (2014a).
Interdisciplinary approach to disaster resilience education and research.
Procedia Economics and Finance, 18, 601-609.

Faber, M., Nishijima, K., Giuliani, L., Revez, A., Mendes, J., Sparf, J., . . . Bucx, T. (2014b).
Good practice review of interdisciplinary working in disaster resilience educatio
n, EU Life Long Learning Programme, ANDROID Disaster Resilience Network:
(3.6.17) http://www.disaster-
resilience.net/images/Outputs/WP4/appendix%204.3.pdf

Farazmand, A. (2007). Learning from the Katrina crisis: a global and international
perspective with implications for future crisis mangement. *Public Administration
Review, 67(s1)*, 149-159.

Fassin, D., & Pandolfi, M. (2010). Introduction: Military and Humanitarian Government
in the Age of Intervention. In D. Fassin & M. Pandolfi (Eds.), *Contemporary
States of Emergency*. New York: Zone Books.

Feldman, D. L., & Ingram, H. (2009). Making Science Useful to Decision Makers: Climate
Forecasts, Water Management, and Knowledge Networks. *Weather, Climate
and Society, 1*(1), 9-21.

FEMA. (2004). Hurricane Pam Exercise Concludes. Department for Homeland Security,
Washington DC: (3.6.17) http://www.fema.gov/news-
release/2004/07/23/hurricane-pam-exercise-concludes

FEMA. (2011). National Exercise Program. Federal Emergency Management Agency:
(3.6.17) http://www.fema.gov/media-library-data/20130726-1829-25045-
3774/national_exercise_program_base_plan__2011_03_18_.pdf

FEMA. (2015). DRAFT Research Standards for the Academic Discipline of Emergency
Management Updated as of October 2015.

FEMA. (2015). DRAFT Research Standards for the Academic Discipline of Emergency
Management Updated as of October 2015.

Fenwick, T., Seville, E., & Brunsdon, D. (2009). Reducing the Impact of Organisational
Silos on Resilience: Resilient Organisations Research Report 2009/01: University
of Canterbury NZ.

Ferreira, R., Buttell, F., & Ferreira, S. (2015). Ethical considerations for conducting
disaster research with vulnerable populations. *Journal of Social Work Values
and Ethics, 12*(1), 29-40.

Fielden, J., & Middlehurst, R. (2016). Alternative providers of higher education: issues
for policymakers. Oxford: Higher Education Policy Institute.

Fielder, D. (2011). Defining Command, Leadership, and Management Success Factors
within Stability Operations. US: Strategic Studies Institute (SSI).

Filosa, G., & Pope, J. (2007, 24.7.2007). Grand jury refuses to indict Dr Anna Pou. *New York Times*.

Fink, S. (2009). The Deadly Choices at Memorial. *New York Times*.

Fink, S. (2010). Worst case: rethinking tertiary triage protocols in pandemics and other health emergencies. *Critical Care, 14*(1), 103.

Fink, S. (2014). *Five Days at Memorial: Life and Death in a Storm-Ravaged Hospital*: Atlantic.

Fischer, A., Wentholt, M., Rowe, G., & Frewer, L. (2013). Expert involvement in policy development: A systematic review of current practice. *Science and Public Policy, 2013*, 1-12.

Fischer, H. (2003). The Sociology of Disaster: Definitions, Research Questions and Measurements. Continuation of the Discussion in a Post-September 11 Environment. *Int J of Mass Emergencies and Disasters, 21*(1), 91-107.

Fischer, H., Gregoire, K., Scala, J., Letukas, L., Mellon, J., Ramine, S., & Turner, D. (2006). *The emergency management response to Hurricane Katrina: As told by the first responders— a case study of what went wrong and recommendations for the future*. Center for Disaster Research and Education, University of Pennsylvania.

Fischetti, M. (2001). Drowning New Orleans. *Scientific American, 285,* 76-85.

Fitt, H. (2011). Christchurch Earthquake Activity Inventory. Lincoln NZ: Landcare Research (3.6.17) http://www.landcareresearch.co.nz/publications/researchpubs/ChristchurchEarthquakeActivityInventory.pdf.

Flin, R. (1996). *Sitting in the Hot Seat. Leaders and Teams for Critical Incident Management*. Chichester: Wiley.

Flin, R. (2008). The Psychology of Command. In UK Dept Communities and Local Government (Ed.), *Fire Service Operations: Incident Command (Appendix 3)* (pp. 107-117): TSO.

Flin, R., & Crichton, M. (2004). Risk based decision-making: mitigating threat - maximising opportunity (Appendix 2). In National Audit Office (Ed.), *Managing Risks to Improve Public Services* (pp. 53-63). London: TSO.

Flin, R., & Slaven, G. (1995). Identifying the right stuff: selecting and training on-scene emergency commanders. *J of Contingencies and Crisis Management, 3*(2), 113-123.

Flin, R., & Slaven, G. (1996). Personality and Emergency Command Ability. *Disaster Prevention and Management, 5*(1), 40-46.

Flyvbjerg, B. (2001). *Making Social Science Matter: Why social inquiry fails and how it can succeed again*. Cambridge University Press.

Flyvbjerg, B. (2004). Phronetic Planning Research: Theoretical and Methodological Reflections. *Planning Theory & Practice, 5*(3), 283-306.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12*(2), 219-245.

Flyvbjerg, B. (2011). Case Study. In N. Denzin & Y. Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (4th ed., pp. 301-316). Thousand Oaks CA: Sage.

Flyvbjerg, B., Landman, T., & Schram, S. (2012). Important next steps in phronetic social science. In B. Flyvbjerg, T. Landman, & S. Schram (Eds.), *Real Social Science: Applied Phronesis* (pp. 285-297). Cambridge University Press

Foresight (2012). Reducing Risks of Future Disasters: Priorities for Decision Makers. London: UK Government Office for Science.

Foresight. (2011a). Migration and Global Environmental Change: Future Challenges and Opportunities. London: UK Government Office for Science.

Foresight. (2011b). International Dimensions of Climate Change: Final Report. London: UK Government Office for Science.

Foresight. (2016). The UK's Skills Mix: Current Trends and Future Needs. In M. Campbell (Ed.), *Future of Skills & Lifelong Learning Evidence Review*. London: UK Government.

Foster, H. D. (1980). *Disaster Planning: The Preservation of Life and Property*. New York: Springer-Verlag.

Fothergill, A. (2000). Knowledge transfer between researchers and practitioners. *Natural Hazards Review, 1*(2), 91-98.

Foti, C. (2007). Memorial Hospital Center Investigation: Documents in the Custody of the Louisiana Attorney General's Office (dated 24.7.2007). Baton Rouge Department of Justice.

Franey, E. (2009). *Immunity, Individuals and International Law.* (PhD), London School of Economics.

Franklin, D., & Andrews, J. (Eds.). (2012). *Megachange: The World in 2050*. London: The Economist.

Freeman, C. (2015, 30.5.15). How to defeat a caliphate: Private military contractors have a bad name, but a great record against the Islamist insurgency in Nigeria. *The Spectator*.

Freimuth, V., Hilyard, K., Barge, K., & Sokler, L. (2008). Action, Not Talk: A simulation of risk communication during the first hours of a pandemic. *Health Promotion Practice, 9*(4), 358-445.

Freudenburg, W., Gramling, R., Laska, S., & Erikson, K. (2009). *Catastrophe in the Making: The Engineering of Katrina and the Disasters of Tomorrow*. Washington DC: Island Press.

Frisell, E., & Oredsson, M. (2006). Building Crisis Management Capacity in the EU. Stockholm: FOI.

Fritz, C., & Mathewson, J. (1957). Convergence Behaviour in Disasters: A Problem in Social Control. National Academy of Sciences: Committee on Disaster Studies: (3.6.17) https://ia800304.us.archive.org/10/items/convergencebehav00fritrich/convergencebehav00fritrich.pdf .

Fry, H., & Marshall, S. (2002). Revitalising and renewing the curriculum. In S. Ketteridge, S. Marshall, & H. Fry (Eds.), *The Effective Academic*. London: Kogan Page.

Fuerth, L. (2007). Congress and the Climate Crisis: A Case for Forward Engagement - Research Brief No.3: New York University Wagner Grad School of Public Service.

Gabe, T., Falk, G., McCarty, M., & Mason, V. W. (2005). Hurricane Katrina: Social-demographic characteristics of impacted areas: Congressional Research Service, Library of Congress Washington DC.

Gainsford, R. (1992). Peacetime emergency planning in Britain - a County Emergency Planning Officers' Society view. In D. Parker & J. Handmer (Eds.), *Hazard Management and Emergency Planning: Perspectives on Britain*. London: James & James Science Publishers.

Gale, N. K., Heath, G., Cameron, E., Rashid, S., & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology, 13*, 117-117. doi:10.1186/1471-2288-13-117

Gao, H., Wang, X., Barbier, G., & Liu, H. (2011). *Promoting coordination for disaster relief–from crowdsourcing to coordination.* Paper presented at the International Conference on Social Computing, Behavioral-Cultural Modelling, and Prediction.

Gardiner, S. (2010). Saved by disaster? Abrupt climate change, political inertia and the possibility of an intergenerational arms race. In S. Skrimshire (Ed.), *Future Ethics* (pp. 83-106): Continuum.

Garnet, J., & Kouzmin, A. (2007). Communicating throughout Katrina: Competing and Complimentary Conceptual Lenses on Crisis Communication. *Public Administration Review, December 2007*(Special Issue), 171- 188.

Garrett, A. L., Grant, R. F., Madrid, P., Brito, A., Abramson, D. M., & Redlener, I. E. (2007). Children and Megadisasters: Lessons Learned in the New Millennium. *Advances in Paediatrics, 54*, 189-214.

Garwin, R. (1979). Weapons Developments and the Threat of Nuclear War. In F. Griffiths & J. Polanyi (Eds.) *The Dangers of Nuclear War: A 'Pugwash' Symposium* (pp. 93-106): University of Toronto Press.

Gereski, J., & Brown, C. (2010). Two Hats Are Better Than One: The Dual-Status Commander in Domestic Operations. *The Army Lawyer, June 2010*, 72-83.

Getha-Taylor, H., & Morse, R. (2013). *Toward more holistic theorising about public leadership*. Paper presented at the 11th Public Management Research Conference, Madison, Wisconsin.

Ghamari- Tabrizi, S. (2000). Simulating the unthinkable: gaming future war in the 1950s and 1960s. *Social Studies of Science, 30*(2), 163-223.

Gheytanchi, A., Joseph, L., Gierlach, E., Kimpara, S., Housley, J., Franco, Z., & Beutler, L. (2007). The dirty dozen: twelve failures of the hurricane Katrina response and how psychology can help. *American Psychologist, February - March* 118-130.

Gigerenzer, G., & Edwards, A. (2003). Simple tools for understanding risks: from innumeracy to insight. *British Medical Journal, 327*(7417), 741-744.

Gilpin, D., & Murphy, P. (2008). *Crisis Management in a Complex World*. New York: Oxford University Press.

Giuliani, R. (2002). *Leadership*. London: Sphere.

Glavovic, B., Limburg, K., Liu, K.-K., Emeis, K.-C., Thomas, H., Kremer, H., . . . Swanley, D. (2015). Living on the Margin in the Anthropocene: engagement arenas for sustainability research and action at the ocean–land interface. *Current Opinion in Environmental Sustainability, 14*, 232-238.

Gold, E. (2003). *Command: privilege or peril? The shipmaster's legal rights and responsibilities*. Paper presented at the 12th International Command Seminar: Restoring Confidence in Command, London.

Gottschalk, J. (2002). *Crisis Management*. Oxford: Capstone Publishing.

Gowing, N. (2010). *'Skyful of Lies' and Black Swans: the new tyranny of shifting information power in crises*. Oxford: Reuters Institute for the Study of Journalism.

Grant, M. (2009). *After the Bomb: Civil Defence and Nuclear War in Cold War Britain 1945-1968*: Palgrave.

Gray, D. (2004). *Doing Research in the Real World*. London: Sage.

Green, J. J., Kleiner, A. M., & Montgomery, J. P. (2007). The texture of local disaster response: service provider's views following Hurricane Katrina. *Southern Rural Sociology, 22*(2), 28-44.

Green, L., & Seifert, C. (2005). Translation of research into practice: why we can't "just do it". *J Am Board Family Practice, 18*, 541-545.

Gregory, F. (2007). Private Sector Roles in Counter-terrorism. In P. Wilkinson (Ed.), *Homeland Security in the UK* (pp. 321-330). London: Routledge.

Grimaud, M. (1977). *En mai, fais ce qu'il te plait*. Paris: Stock

Grint, K. (2002). Management or Leadership? *J of Health Services Research & Policy, 7*(4), 248-251.

Grint, K. (2005). Problems, problems, problems: The Social Construction of 'Leadership'. *Human Relations, 58*(11), 1467-.

Grint, K. (2009). Leadership and Resilience Research Report.

Grint, K. (2010). The cuckoo clock syndrome: addicted to command, allergic to leadership. *European Management Journal, 28*(4), 306-313.

Grint, K. (2010). Wicked Problems and Clumsy Solutions: The Role of Leadership. In S. Brookes & K. Grint (Eds.), *A New Public Leadership Challenge*: Proof.

Groenendaal, J., & Helsloot, I. (2015). The application of Naturalistic Decision Making (NDM) and other research: lessons for frontline commanders. *Journal of Management and Organization, 22*(2), 173-185.

Groenendaal, J., Helsloot, I., & Scholtens, A. (2013). A critical examination of the assumptions regarding centralised coordination in large-scale emergency situations. *J of Homeland Security and Emergency Management, 10*(1), 1-23.

Gross, O., & Aolain, F. N. (2006). *Law in Times of Crisis: Emergency Powers in Theory and Practice*: Cambridge University Press.

Guba, E., & Lincoln, Y. (2005). Paradigmatic controversies, contradictions, and emerging confluences. In N. Denzin & Y. Lincoln (Eds.), *Handbook of Qualitative Research* (3rd ed., pp. 191-216). Thousand Oaks, CA: Sage.

Guihou, X., Lagadec, P., & Lagadec, E. (2006). Non-conventional Crises and Critical Infrastructure: EDF Energy (Risk Management Division).

Guin, C., Robinson, L., Boyd, E., & Levitan, M. (2006). *Health Care and Disaster Planning: Understanding the Impact of Disasters on the Medical Community*. United States: Louisiana State University.

Gundel, S. (2005). Towards a New Typology of Crises. *J of Contingencies and Crisis Management, 13*(3), 106-115.

Gunderson, L. (2010). Ecological and Human Community Resilience in Response to Natural Disasters. *Ecology and Society, 15*(2), 18.

Gunderson, L., & Holling, C. (Eds.). (2002). *Panarchy: Understanding Transformations in Human and Natural Systems* Island Press

Habegger, B. (2010). Strategic foresight in public policy: Reviewing the experiences of the UK, Singapore, and the Netherlands. *Futures, 42*, 49-58.

Hagen, K., Watson, H., Wadhwa, K., Tzanetakis, M., Kreissl, R., Pescaroli, G., . . . Ritchey, T. (2014). Crisis case studies of cascading and/or crossborder disasters. EU FORTRESS Project: Foresight Tools for Responding to cascading effects in a crisis: (3.6.17) http://fortress-project.eu/wp-content/uploads/2014/04/FORTRESS-D3.1_Crisis-case-studies-of-cascading-and-or-crossborder-disasters.pdf.

Halal, W. E., & Marien, M. (2011). Global MegaCrisis: Four Scenarios, Two Perspectives. *The Futurist, May-June 2011*.

Hallegatte, S., Green, C., Nicholls, R. J., & Corfee-Morlot, J. (2013). Future flood losses in major coastal cities. *Nature Clim. Change, 3*(9), 802-806. doi:10.1038/nclimate1979

Hallier, J., & Foirbes, T. (2004). In search of theory development in grounded investigations: Doctors' experiences of managing as an example of fitted and prospective theorising. *J of Management Studies, 4*, 1379-1410.

Hammersley, M. (2012). Methodological paradigms in educational research: British Educational Research Association: (3.6.17) https://www.bera.ac.uk/researchers-resources/publications/methodological-paradigms-in-educational-research

Hampton, A. (2016, 26.4.16). Five Former New Orleans Police Officers Plead Guilty to Shootings After Katrina. *SB News Online*.

Handmer, J., & Parker, D. (1992). The role of the Home Office. In D. Parker & J. Handmer (Eds.), *Hazard Management and Emergency Planning: Perspectives on Britain* (pp. 25-30). London: James & James.

Hannah, S. (2010). Leadership in the Profession of Arms. In M. Rumsey (Ed.), *Oxford Handbook of Leadership*. New York: Oxford University Press.

Hannah, S., Campbell, D., & Matthews, M. (2010). Advancing a Research Agenda for Leadership in Dangerous Contexts. *Military Psychology, 22*(Supplement), S157-S189.

Hannah, S., Uhl-Bien, M., Avolio, B., & Cavarretta, F. (2009). A framework for examining leadership in extreme contexts. *The Leadership Quarterly, 20*, 897-919.

Harman-Stokes, K. (1995). Community right-to-know in the newly independent states of the former Soviet Union: ending the culture of secrecy surrounding the environmental crisis. *Virginia Environmental Law Journal, Fall* (15).

Harrald, J. (2006). Agility and Discipline: Critical Success Factors for Disaster Response. *Annals of the American Academy, 604*, 265-272.

Harrald, J. (2012). Hurricane Katrina: Crisis Leadership that Failed a Country. In I. Helsloot, A. Boin, B. Jacobs & L. Comfort (Eds.), *Mega-Crisis* (pp. 37-50). Springfield, Illinois USA: Charles C Thomas.

Hart, C. (1998). *Doing a Literature Review*. London: Sage.

Hartman, C., & Squires, G. (Eds.). (2006). *There is no such thing as a Natural Disaster: Race, Class, and Hurricane Katrina*. New York: Routledge.

Hawdon, J. (2008). Legitimacy, trust, social capital, and policing styles. *Police Quarterly, 11*(2), 182-201.

HE Commission. (2012). *Postgraduate Education: An Independent Inquiry by the Higher Education Commission*. London: Policy Connect.

Heath, R. (1995). The Kobe earthquake: some realities of strategic management of crises and disasters. *Disaster Prevention and Management, 4*(5), 11-24.

Heath, R. (1998). *Crisis Management for Managers and Executives*. London: Financial Times Pitman Publishing.

Helbing, D. (2013). Globally networked risks and how to respond. *Nature, 497*, S1-S9.

Helsloot, I., Boin, A., Jacobs, B., & Comfort, L. (Eds.). (2013). *Mega-Crises: Understanding the Prospects, Nature, Characteristics and Effects of Cataclysmic Events*: Charles C Thomas Pub Ltd.

Hendrix, C., & Haggard, S. (2015). Global food prices, regime type, and urban unrest in the developing world. *Journal of Peace Research, 52*(2), 143-157.

Hennessy, P. (2002). *The Secret State: Whitehall and the Cold War* Penguin Books

Hennessy, P. (2010). *The Secret State: Preparing for the Worst 1945-2010* (2nd ed.): Penguin Books

Hensell, S. (2015). Coordinating intervention: International actors and local 'partners' between ritual and decoupling. *J of Intervention and State-building, 9*(1), 89-111.

Herman, C. (1972). Some issues in the study of international crises. In C. Herman (Ed.), *International Crises: Insights from Behavioral Research* (pp. 3-17). New York: Free Press.

Herman, M., & Dayton, B. (2009). Transboundary Crises through the Eyes of Policymakers: Sense Making and Crisis Management. *J of Contingencies and Crisis Management, 17*(4), 233-241.

Hernon, I. (2006). *Riot: Civil Insurrection from Peterloo to the Present Day*. London: Pluto Press.

Herranz, S., Romero-Gómez, R., Díaz, P., & Onorati, T. (2014). Multi-view visualizations for emergency communities of volunteers. *Journal of Visual Languages & Computing, 25*(6), 981-994.

Hertfordshire FRS. (2011). Exercising the Unthinkable. Hertfordshire Fire & Rescue Service & Cabinet Office.

Hicks, W. (2007). Hurricane Katrina: Law Enforcement, Social Disorganization, and the Altruistic Community: An Ethnographic Study. *Law Enforcement Executive Forum, 7*(2), 149-160.

Hiles, A (2007) *The Definitive handbook of Business Continuity Management* (2nd Ed), Wiley.

Hillman, N. (Ed.) (2015). *It's the finance, stupid! The decline of part-time higher education and what to do about it*. Oxford: Higher Education Policy Institute.

Hills, A. (2002). Responding to Catastrophic Terrorism. *Studies in Conflict & Terrorism, 25*, 245-261.

Hines, A., & Bishop, P. C. (2013). Framework foresight: Exploring futures the Houston way. *Futures,* Hines, A., & Gold, J. (2013). Professionalizing foresight: Why do it, where it stands, and what needs to be done. *J of Future Studies, 17*(4), 35-54.

HM Inspector of Constabulary. (2009). Stockwell - MPS Progress: January 2008 - April 2009. London: Home Office.

Holling, C. (1973). Resilience and stability of ecological systems. *Annu. Rev. Ecol. Syst., 4*, 1-23.

Holling, C. (2004). From Complex Regions to Complex Worlds. *Ecology and Society, 9*(1), 11.

Home Office. (1980). Protect and Survive. London: HMSO.

Home Office. (1989). *Review of arrangements for dealing with civil emergencies in the UK*. London: HMSO.

Home Office. (1992a). Dealing with Disaster. London: HMSO.

Home Office. (1992b). Principles of Command & Control. London: Home Office.

Honore, R. (2009). *Survival: how a culture of preparedness can save you and your family from disasters*. New York: Atria Books.

Hood, C., & Jackson, M. (1992). The New Public Management: a recipe for disaster? In D. Parker & J. Handmer (Eds.), *Hazard Management and Emergency Planning: Perspectives on Britain*. London: James and James.

Hornburg, H. (1997, 2013). Joint Task Force Commander's Handbook for Peace Operations. Fort Monroe: US Department of Defence.

Horwitz, S. (2008). *Making Hurricane Response More Effective: Lessons from the Private Sector and the Coast Guard during Katrina*. George Mason University: Mercatus Centre.

Howitt, A. (2012). Catastrophic Disasters: Confronting Novel Preparedness Challenges. Harvard Kennedy School: (3.6.17) http://www.canon-igs.org/event/report/report_120723/pdf/120723_howitt_presentation.pdf

Howitt, A., & Leonard, H. (2006). Katrina and the Core Challenge of Disaster Response. *Fletcher Forum of World Affairs, 30*(1), 215.

HSE. (1992). Appleton Inquiry Report: Report of an inquiry into health and safety aspects of stoppages caused by fire and bomb alerts on London Underground, British Rail and other mass transit systems. London: Health and Safety Executive, HMSO.

HSE. (1999). A Guide to the Control of Major Accident Hazards Regulations 1999 (as amended). *Guidance on Regulations*. London: Health and Safety Executive.

HSE. (2001). *Document G - Major Incident Response and Investigation Policy and Procedures*. London: Health and Safety Executive (Operations Unit).

HSE. (2009a). Enforcement Policy Statement. London: Health and Safety Executive.

HSE. (2009b). Striking the balance between operational and health and safety duties in the Police Service. London: Health and Safety Executive.

Hubble, S., & Foster, D. (2017). Higher Education and Research Bill: Lords amendments and Ping Pong. London: House of Commons Library.

Human Security Report Project. (2011). Human Security Report 2009/2010: The Causes of Peace and the Shrinking Costs of War. New York: Oxford University Press.

Hustinx, L., & Lammertyn, F. (2003). Collective and Reflexive Styles of Volunteering: A Sociological Modernization Perspective. *Voluntas: International Journal of Voluntary and Nonprofit Organizations, 14*(2), 167-187.

Hustmyre, C. (2006). NOPD versus Hurricane Katrina. *Tactical Response* July/August.

Hyvärinen, J., Laajalahti, A., & Vos, M. (2015). Enhancing citizen response to crises through communication: investigating expert views. *International Journal of Emergency Management, 11*(4), 302-319.

IAMSAR. (2016). *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual* (Vol. III). London: International Maritime Organisation & International Civil Aviation Organization.

IEM. (2004). Southeast Louisiana Catastrophic Hurricane Functional Plan. Baton Rouge LA: (3.6.17) http://msnbcmedia.msn.com/i/msnbc/Components/Interactives/News/US/Katrina/docs/Southeast_Louisiana_Catastrophic_Hurricane_Functional_Plan.pdf.

IEM. (2006). "Hurricane Pam" Southeast Louisiana Catastrophic Hurricane Planning Project. Washington DC: (3.6.17) http://iem.com/case-studies/hurricane-pam

Ignatieff, M. (2005, 25.9.05). The Broken Contract. *New York Times Magazine*.

IMO. (2012). Interim guidance to private maritime security companies providing privately contracted armed security personnel on board ships in the high-risk area. London: International Maritime Organisation.

IMO/ICAO. (2016). *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual* (Vol. III). London: International Maritime Organisation & International Civil Aviation Organization.

Ingrassia, P. L., Foletti, M., Djalali, A., Scarone, P., Ragazzoni, L., Corte, F. D., . . . Fisher, P. (2014). Education and training initiatives for crisis management in the European Union: a web-based analysis of available programs. *Prehospital and Disaster Medicine, 29*(02), 115-126.

Ink, D. (2006). An Analysis of the House Select Committee and White House Reports on Hurricane Katrina. *Public Administration Review, November-December*, 800-807.

Institute of Civil Engineers. (1995). *Megacities - Reducing Vulnerability to Natural Disasters*. London: Thomas Telford.

Institute of Civil Engineers. (2010). Facing up to Rising Sea-Levels: retreat, attack, defend. *The future of our coastal and estuarine cities*. London: Institution of Civil Engineers.

Iserson, K., Heine, C., Larkin, G., Moskop, J., Baruch, J., & Aswegan, A. (2008). Fight or flight: the ethics of emergency physician disaster response. *Annals Emergency Medicine, 51*(4), 345-353.

Jackson, B., & Parry, K. (2008). *Studying Leadership*: Sage.

Jacob, B., Mawson, A., Payton, M., & Guignard, J. (2008). Disaster Mythology and Fact: Hurricane Katrina and Social Attachment. *Public Health Reports, 123*(Sept-Oct), 555-566.

James, E., & Wooten, L. (2010). *Leading under Pressure: from Surviving to Thriving Before, During and After a Crisis*. New York: Routledge.

James, E., Wooten, L., & Dushek, K. (2011). Crisis Management: Informing a New Leadership Research Agenda. *The Academy of Management Annals, 5*(1), 455-493.

Janis, I. L. (1951). *Air War and Emotional Stress: psychological studies of bombing and civilian defense*. New York: McGraw-Hill.

Janis, I. L. (1971). Groupthink. *Psychology Today*.

Janssen, M., Lee, J., Bharosa, N., & Cresswell, A. (2010). Advances in multi-agency disaster management: Key elements in disaster research. *Information Systems Frontiers, 12*(1), 1-7.

Jardine-Smith, D. (2015). The On-Scene Coordinator (pp. n). International Maritime Rescue Federation: (3.6.17) http://www.imrfmro.org/mro-library-command-control-coordination-download/file/945-4-4-the-on-scene-coordinator

Jarvenpaa, S., & Majchrzak, A. (2008). Knowledge collaboration among professionals protecting national security: role of transactive memories in ego-centered knowledge networks. *Organisation Science, 19*(2), 260-276.

Jarzabkowski, P. A., Lê, J. K., & Feldman, M. S. (2012). Toward a theory of coordinating: Creating coordinating mechanisms in practice. *Organization Science, 23*(4), 907-927.

Jenkins, D. P., Salmon, P. M., Stanton, N. A., & Walker, G. H. (2010). A systemic approach to accident analysis: A case study of the Stockwell shooting. *Ergonomics, 53*(1), 1-17.

Jennings, W. (2012). *Olympic Risks*: Palgrave Macmillan.

Jensen, J. (2013). Report of the Disciplinary Purview Focus Group: Scholarship and research to ground the emerging discipline of emergency management. North Dakota State University.

Jensen, J. (2016). Emergency Management Scholarly Research Resources: FEMA.

Jensen, J., & Waugh, W. J. (2014). The United States' experience with the Incident Command System: what we think we know and what we need to know more about. *J of Contingencies and Crisis Management, 22*(1).

Jensen, J., Klenow, D., Rowel, R., Trainor, J., & Waugh, W. J. (2012). Research Standards Focus Group September 26-27, 2012 *Emergency Management Higher Education Program*: Emergency Management Institute (EMI).

Jensen, K., Forsberg, E.-M., Gamborg, C., Millar, K., & Sandoe, P. (2011). Facilitating ethical reflection among scientists using the Ethical Matrix. *Science & Engineering Ethics, 17*, 425-445.

JESIP. (2016). Joint Doctrine: The Interoperability Framework. London: Joint Emergency Services Interoperability Project.

Johnson, A. (2011). Digging Further. (3.6.17) http://www.myneworleans.com/New-Orleans-Magazine/March-2011/DIGGING-FURTHER/

Johnson, D. (2006). Service Assessment: Hurricane Katrina August 23-31, 2005. National Oceanic and Atmospheric Administration (NOAA).

Johnson, D. E. (2002). Preparing Potential Senior Army Leaders for the Future: An Assessment of Leader Development Efforts in the Post–Cold War Era: RAND.

Johnson, P. (2005a). Katrina rekindles adversarial media. *USAToday*. (3.6.17) http://usatoday30.usatoday.com/life/columnist/mediamix/2005-09-05-media-mix_x.htm

Johnson, P. (2005b). Katrina could forever change how TV news covers storms. *USAToday*. (3.6.17) http://usatoday30.usatoday.com/life/columnist/mediamix/2005-09-25-media-mix_x.htm#

Johnson, P. (2005c). Katrina may unleash a media storm. *USA Today*. (3.6.17) http://usatoday30.usatoday.com/life/television/news/2005-09-05-katrina-coverage_x.htm#

Johnston, H. (2012). The spiral curriculum. Education Partnerships: (3.6.17) http://eric.ed.gov/?id=ED538282.

Jones, C., & Mitnick, S. (2006). Open source disaster recovery: Case studies of networked collaboration. *First Monday, 11*(5), 1.5.2006.

Jong, W., Dückers, M. L. A., & van der Velden, P. G. (2016). Leadership of Mayors and Governors during Crises: A Systematic Review on Tasks and Effectiveness: Leadership of Mayors and Governors during Crises. *Journal of Contingencies and Crisis Management, 24*(1), 46-58.

Jongman, B., Ward, P., & Aerts, J. (2012). Global exposure to river and coastal flooding: Long term trends and changes. *Global Environmental Change, 22*, 823-835.

Judt, T. (2007). *Postwar: A History of Europe since 1945*. London: Pimlico.

Kahan, J. (2015). Resilience redux: buzzword or basis for Homeland Security. *Homeland Security Affairs, 11*(Article 2).

Kahn, H. (1961). *On Thermonuclear War* (2nd ed.). Princetown: University Press.

Kahn, H. (1962). *Thinking the Unthinkable*. New York: Horizon Press.

Kahn, H. (1966). Nuclear Proliferation and Rules of Retaliation. *The Yale Law Journal, 76*(1), 77-91.

Kaigo, M. (2012). Social media usage during disasters and social capital: Twitter and the Great East Japan earthquake. *Keio Communication Review, 34*, 19-35.

Kälin, W., & Schrepfer, N. (2012). *Protecting People Crossing Borders in the Context of Climate Change Normative Gaps and Possible Approaches*. University of Bern, Switzerland: UNHCR.

Kampen, J., & Tamas, P. (2013). Should I take this seriously? A simple checklist for calling bullshit on policy supporting research.

Kandiko, C., & Blackmore, P. (2010). Creating a 21st Century Curriculum: The King's-Warwick Project. Kings College & Warwick University.

Kaplan, D. E. (2000). Aum Shinrikyo (1995). In J. B. Tucker (Ed.), *Toxic Terror* (pp. 207-226). Cambridge, MA: MIT Press.

Kapucu, N., & Garayev, V. (2011). Collaborative decision-making in emergency and disaster management. *Int J of Public Administration, 34*, 366-375

Kapucu, N., Arslan, T., & Collins, M. (2010). Examining Intergovernmental and Interorganisational Response to Catastrophic disasters. *Administration and Society, 42*, 222-247.

Kardong-Edgren, S. (2015). Reframing team training as meta-leadership and swarm intelligence. *Clinical Simulation in Nursing, 11*(5), 276-277.

Kaufmann, D. (2012). The curious case of Dr Anna Pou: hell and high water, *B. Couleur*. (3.6.17) http://www.bcouleur.com/index.php?option=com_content&view=article&id=620:the-mystery-case-of-dr-anna-pou-hell-and-high-water&catid=147:opinion&Itemid=540

Keller, A. Z., Wilson, H., & Kara-Zaitri, C. (1990). The Bradford Disaster Scale. *Disaster Management, 2*(4), 207-213.

Kelman, I. (2008). Myths of Hurricane Katrina. *Disaster Advances, 1*(1), 1-7.

Kemmelmeir, M., Broadus, A., & Padilla, J. (2008). Inter-Group Aggression in New Orleans in the Immediate Aftermath of Hurricane Katrina. *Analyses of Social Issues and Public Policy, 8*(1), 211-245.

Kendra, J., & Wachtendorf, T. (2002). Creativity in Emergency Response to the World Trade Center Disaster. In J. Monday (Ed.), *Beyond September 11th* (pp. 122-146). Colorado.

Kendra, J., & Wachtendorf, T. (2006). *Improvisation, creativity, and the art of Emergency Management*. Paper presented at the NATO Advanced Workshop on Understanding and Responding to Terrorism: A Multi-Dimensional Approach, Washington DC.

Kendra, J., & Wachtendorf, T. (2016). *American Dunkirk: The Waterborne Evacuation of Manhattan on 9/11*. Philadelphia, Pennsylvania: Temple University Press.

Kendra, J., Wachtendorf, T., & Quarantelli, E. (2003). The Evacuation of Lower Manhattan by Water Transport on September 11: An Unplanned "Success". *Joint Commission Journal on Quality and Safety, 29*(6), 316-318.

Keown-McMullan, C. (1997). Crisis: when does a molehill become a mountain? *Disaster Prevention and Management, 6*(1), 4-10.

Kettl, D. (2006). Is the Worst Yet to Come? *Annals AAPSS, 604*, 273-287.

Khanin, D. (2007). Contrasting Burns and Bass: Does the transactional-transformational paradigm live up to Burns' philosophy of transforming leadership? *Journal of Leadership Studies, 1*(3), 7-25.

Khorram-Manesh, A., Ashkenazi, M., Djalali, A., Ingrassia, P. L., Friedl, T., von Armin, G., . . . Gursky, E. (2015). Education in disaster management and emergencies: defining a new European course. *Disaster Medicine and Public Health Preparedness, 9*(03), 245-255.

Kiefer, J., & Montjoy, R. (2006). Incrementalism before the Storm: network performance for the evacuation of New Orleans. *Public Administration Review, December* (Special Issue), 122-130.

Killian, L. (1956). An Introduction to Methodological Problems of Field Studies in Disasters. Washington DC: Committee on Disaster Studies, National Academy of Sciences - National Research Council.

Kiltz, L. (2009). Civic mission of HS education: A response to McCreight. *J of Homeland Security and Emergency Management, 6*(1).

Kiltz, L. (2009). Developing Critical Thinking Skills in Homeland Security and Emergency Management Courses. *J of Homeland Security and Emergency Management, 6*(1).

Kiltz, L. (2011). The Challenges of Developing a Homeland Security Discipline to Meet Future Threats to the Homeland. *J of Homeland Security and Emergency Management, 8*(2 Article 1), 1-22.

Kiltz, L. (2012). The Benefits and Challenges of Integrating Emergency Management and Homeland Security into a New Program. *J of Homeland Security Education, 1*(2), 6-.

King, C. (2008). Part-Time Study in Higher Education: Department of Innovation, Universities and Skills.

Kingdom, J. (1995). *Agendas, alternatives, and public polocoes*. New York: HarperCollins College Publishers.

Kipnis, K. (2007). Forced Abandonment and Euthanasia: A Question from Katrina. *Social Research, 74*(1), 79-100.

Kissinger, H. (1977). *American Foreign Policy*. New York: Norton & Co.

Klein, G. (2008). Naturalistic Decision Making. *Human Factors, 50*(3), 456-460.

Klein, G., & Klinger, D. (1991). Naturalistic decision making. *Gateway, XI* (3), 16-19.

Klein, N. (2007). *The Shock Doctrine: The Rise of Disaster Capitalism*: Metropolitan Books.

Klugman, J. (1999). Social and Economic Policies to Prevent Complex Humanitarian Emergencies: Lessons from Experience. Helsinki, UNU World Institute for Development and Economics Research.

Knight, R., & Pretty, D. (1998). *The Impact of Catastrophes on Shareholder Value*. Oxford: Templeton College.

Knight, R., & Pretty, D. (2005). Protecting Value in the Face of Mass Fatality Events: Oxford Metrica.

Knill, C. (2005). Introduction: Cross-national policy convergence: concepts, approaches and explanatory factors. *Journal of European Public Policy, 12*(5), 764-774.

Kolditz, T. A. (2010). *In extremis leadership: Leading as if your life depended on it* (Vol. 107): John Wiley & Sons.

Konnola, T., Salo, A., Cagnin, C., Carabias, V., & Vilkkumaa, E. (2012). Facing the future: Scanning, synthesizing and sense-making in horizon scanning. *Science and Public Policy, 39*, 222–231.

Kreps, G. (1992). Foundations and principles of emergency planning and management. In D. Parker & J. Handmer (Eds.), *Hazard Management and Emergency Planning: Perspectives on Britain*. London: James and James.

Kroll-Smith, S., Baxter, V., & Jenkins, P. (2015). *Left to Chance: Hurricane Katrina and the Story of Two New Orleans Neighborhoods*: University of Texas Press.

Kroll-Smith, S., Jenkins, P., & Baxter, V. (2007). The Bricoleur and the possibility of rescue: first responders to the flooding of New Orleans. *J of Public Management & Social Policy, Fall 2007*, 5-21.

Kuhn, T. (1970). *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

Kuipers, S., Boin, A., Bossong, R., & Hegemann, H. (2015). Building joint crisis management capacity? Comparing civil security systems in 22 European countries. *Risk, Hazards & Crisis in Public Policy, 6*(1), 1-21.

Kurzman, D. (1986). *Day of the Bomb: Hiroshima 1945*. London: Weidenfeld & Nicolson.

Laakso, K., & Palomaki, J. (2013). The importance of a common understanding in emergency management. *Technological Forecasting & Social Change, 80*, 1703-1713.

Lagadec, P. (1993). *Preventing Chaos in a Crisis: Strategies for prevention, control and damage limitation (La Gestion des Crises)* (J. Phelps, Trans.): McGraw-Hill.

Lagadec, P. (2009a). A New Cosmology of Risks and Crises: Time for a Radical Shift in Paradigm and Practice. *Review of Policy Research, 26*(4), 473-486.

Lagadec, P. (2009b). The Megacrisis Unknown Territory: In Search of Conceptual and Strategic Breakthroughs. Paris: Ecole Polytechnique.

Lagadec, P., & Guihou, X. (2006). Coping with non-conventional crises: from traditional crisis management to strategic leadership in a chaotic world: some guideposts. Paris: Organisation for Economic Cooperation and Development.

Lagadec, P., & Michel-Kerjan, E. (2006). The Paris Initiative, "Anthrax and Beyond": Transnational Collaboration among Interdependent Critical Networks. In P. Auerswald, L. Branscomb, T. La Porte, & E. Michel-Kerjan (Eds.), *Seeds of Disaster, Roots of Response* (pp. 457-480): Cambridge University Press.

Lagadec, P., Beroux, P., & Guilhou, X. (2007). Implementing rapid reflection forces. *Crisis Response, 3*(2), 36-37.

Lagadec, P., Guilhou, X., & Beroux, P. (2008). Rapid Reflection Forces put to the reality test. *Crisis Response Journal, 4*(2), 38-40.

Lalka, R. (2008). The Posse Comitatus Act and the Government Response to Hurricane Katrina. *The Current, 11*(2), 81-100.

Lalonde, C. (2004). In Search of Archetypes in Crisis Management. *J of Contingencies and Crisis Management, 12*(2), 76-88.

Lalonde, C., & Roux-Dufort, C. (2013). Challenges in Teaching Crisis Management: Connecting Theories, Skills, and Reflexivity. *J of Management Education, 37*(1), 21-50.

Lanzara, G. F. (1983). Ephemeral organizations in extreme environments: emergence, strategy, extinction. *Journal of Management Studies, 20*(1), 71-95.

LaPorte, T. (1996). High Reliability Organisations: Unlikely, demanding, and at risk. *J of Contingencies and Crisis Management, 4*, 60-71.

LaPorte, T. (2005). *Anticipating Rude Surprises: Reflections on "Crisis Management" Without End*. Paper presented at the Communicable Crises: Prevention, Management and Resolution in an Era of Globalization, Vancouver BC. (3.6.17) http://polisci.berkeley.edu/sites/default/files/people/u3825/RudeSurprisesIPM RConf05.pdf

LaPorte, T. (2007). Critical Infrastructure in the face of a predatory future: Preparing for an untoward surprise. *J of Contingencies and Crisis Management, 15*(1), 60-64.

LaPorte, T., & Consolini, P. (1991). Working in practice but not in theory: theoretical challenges of "High-Reliability Organizations". *Journal of Public Administration Research and Theory, 1*, 19-47.

Larabee, A. (1999). *Decade of Disaster*: University of Illinois.

Larkin, G. (2010). Unwitting Partners in Death: The Ethics of Teamwork in Disaster Management. *American Medical Association Journal of Ethics (Virtual mentor), 12*(6), 495-501.

Larson, S., Olsoson, E., & Ramberg, B. (2005). *Crisis Decision Making in the European Union*. Stockholm: CRISMART.

Laska, S. (2004). What if Hurricane Ivan had not missed New Orleans. *Natural Hazards Observer, 29*(2), 5-6.

Lasker, R. D., Macdonald, N., & Hébert, P. C. (2009). Editorial: Fixing the fatal flaw in emergency planning. *Canadian Medical Association Journal, 181*(10), 661.

Lavis, J. N., Robertson, D., Woodside, J. M., McLeod, C. B., & Abelson, J. (2003). How can research organizations more effectively transfer research knowledge to decision makers? *Milbank Quarterly, 81*(2), 221-248.

Lawton, A., & Paez, I. (2015). Developing a framework for ethical leadership. *J of Business Ethics, 130*, 639-649.

Layton, D. (1993). *Technology's Challenge to Science Education*. Bristol: Taylor and Francis.

Le Bellu, S. (2016). Learning the secrets of the craft through the real-time experience of experts: capturing and transferring experts' tacit knowledge to novices. *Perspectives interdisciplinaires sur le travail et la santé* (18-1).

Lee, A., Brennan, M., & Green, B. (2009). Re-imagining doctoral education: professional doctorates and beyond. *Higher Education Research & Development, 28*(3), 275-287.

Lee, Y.-I., Trim, P., Upton, J., & Upton, D. (2009). Large Emergency-Response Exercises: Qualitative Characteristics - A Survey. *Simulation & Gaming, 40*(6), 726-751. doi:10.1177/1046878109334006

Leigh, M. (2016). Changes in the public sector resilience landscape *EPC Occasional Paper 17*. Emergency Planning College.

Leigh, M., MacFarlane, R., & Williams, D. (2012). Leadership in multi-agency emergency coordinating groups: a functional approach. Emergency Planning College UK.

Leithwood, K., Day, C., Sammons, P., Harris, A., & Hopkins, D. (2006). *Successful School Leadership: What It Is and How It Influences Pupil Learning*. Department for Education and Skills

Lekka, C. (2011). High reliability organisations: A review of the literature *Research report 899*. Health and Safety Executive: (3.6.17) http://www.hse.gov.uk/research/rrpdf/rr899.pdf.

Leonard, H., & Howitt, A. (2006). Katrina as prelude: preparing for and responding to Katrina-Class disturbances in the United States - Testimony to US Senate Committee, March 8, 2006. *J of Homeland Security and Emergency Management, 3*(2), Article 5.

Leonard, H., & Howitt, A. (2012). *Rethinking the management of large-scale national risks*. Paper presented at the 2nd OECD Workshop on Strategic Crisis Management, Geneva.

Leonard, H., & Howitt, A. (2013). Leading in crisis: observations on the political and decision-making dimensions of response. In I. Helsloot, A. Boin, B. Jacobs, & L. Comfort (Eds.), *Mega-Crisis: Understanding the Prospects, Nature, Characteristics and the Effects of Cataclysmic Events*. Springfield, Illinois: Charles C Thomas.

LESLP. (1993). *London Emergency Services Liaison Panel Major Incident Procedure*. London: Metropolitan Police Service.

LESLP. (2012). London Emergency Services Liaison Panel: Major Incident Procedure. London: TSO.

Ley, B., Ludwig, T., Pipek, V., Randall, D., Reuter, C., & Wiedenhoefer, T. (2014). Information and expertise sharing in inter-organizational crisis management. *Computer Supported Cooperative Work (CSCW), 23*(4-6), 347-387.

Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011). Paradigmatic controversies, contradictions, and emerging confluences, revisited. *The Sage handbook of qualitative research, 4*, 97-128.

Lind, C., Tirado, M., Butts, C., & Petrescu-Prahova, M. (2008). Brokerage roles in disaster response: organisational mediation in the wake of Hurricane Katrina. *Int J of Emergency Management, 5*(1), 75-99.

Lindahl, C. (2013). Transforming Endurance. In B. Ancelet, M. Gaudet, & C. Lindahl (Eds.), *Second Line Rescue: Improvised Responses to Katrina and Rita*. University Press of Mississippi

Lindell, M. (2011). Disaster Studies: Sociopedia.ISA.

Lindlof, T., & Taylor, B. (2011). *Qualitative Communication Research Methods* (3rd ed.). Thousand Oaks CA: Sage.

Lindsay, B. (2011). *Social media and disasters: current uses, future options, and policy considerations*. Washington, Congressional Research Service: (3.6.17) http://fas.org/sgp/crs/homesec/R41987.pdf

Linnell, M. (2014). Citizen response in crisis: individual and collective efforts to enhance community resilience. *Human Technology, 10*(2), 68-94.

Lipshitz, R., Klein, G., Orasanu, J. & Salas E.,. (2001). Taking Stock of Naturalistic Decision Making. *J of Behavioural Decision Making, 14*, 331-352.

Lipsky, M. (1980). Street-level bureaucracy: Dilemmas of the individual in public services. New York: Russell Sage Foundation.

Lipton, E. (2006). Key Documents Regarding the Government Response to Katrina. *New York Times*.

Lipton, E., Drew, C., Shane, S., & Rohde, D. (2005, 11.9.2005). Storm and Crisis: Government Assistance; Breakdowns marked path from hurricane to anarchy. *The New York Times*.

Littlefield, R., & Quenette, A. (2007). Crisis leadership and Hurricane Katrina: the portrayal of authority by the media in natural disasters. *Journal of Applied Communication Research, 35*(1), 26-47.

Liu, H.-Y. (2010). Leashing the Corporate Dogs of War: The Legal Implications of the Modern Private Military Company. *Journal of Conflict and Security Law, 15*(1), 141-168.

Liu, S. B., & Palen, L. (2010). The new cartographers: Crisis map mashups and the emergence of neogeographic practice. *Cartography and Geographic Information Science, 37*(1), 69-90.

London Assembly. (2006). Report of the 7 July Review Committee. London: Greater London Authority.

London Regional Resilience Forum. (2006). Looking Back, Moving Forward: Multi-Agency Debrief. London: Government Office for London.

London Resilience Partnership. (2012). Command, Control and Information Sharing Protocol. London: Greater London Authority.

London Resilience. (2009). London Strategic Emergency Plan. Government Office for London.

Longstaff, P. (2009). Managing surprises in complex systems: multidisciplinary perspectives on resilience. *Ecology & Society, 14*(1), 49.

Longstaff, P. H. (2005). Security, resilience, and communication in unpredictable environments such as terrorism, natural disasters, and complex technology *Center for Information Policy Research, Harvard University*.

Luft, R. (2009). Beyond Disaster Exceptionalism: Social Movement Developments in New Orleans after Hurricane Katrina. *American Quarterly, 61*(3), 499-527.

Lutz, L., & Lindell, M. (2008). Incident Command System as a Response Model within Emergency Operations Centres during Hurricane Rita. *J of Contingencies and Crisis Management, 16*(3).

MacDonald, K., & Tipton, C. (1993). Using Documents. In J. Gilbert (Ed.), *Researching Social Life*: Sage.

Macintyre, A. G., Barbera, J. A., & Smith, E. R. (2006). Surviving collapsed structure entrapment after earthquakes: a "time-to-rescue" Analysis. *Prehospital and Disaster Medicine, 21*(1), 4-19.

Mackenzie, N., & Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. *Issues In Educational Research, 16*(2), 193-205.

MacManus, S., & Caruson, K. (2011). Emergency Management: Gauging the Extensiveness and Quality of Public- and Private-Sector Collaboration at the Local Level. *Urban Affairs Review, 47*(2), 280-299.

Maer, L., & Gay, O. (2009). The Royal Prerogative *Standard Note: SN/PC/03861*. London, House of Commons Library: (3.6.17)
http://researchbriefings.files.parliament.uk/documents/SN03861/SN03861.pdf

Majchrzak, A., Jarvenpa, S., & Hollingshead, A. (2007). Coordinating expertise among emergent groups responding to disasters. *Organisational Science, 18*(1), 147-161.

Malalgoda, C., Amaratunga, D., Haigh, R., Keraminiyage, K., & Weeresinghe, S. (2016). Professional education in disaster resilience in the built environment: IIIRR.

Malcolm, J. (2013). Project Argus and the resilient citizen. *Politics, 33*(4), 311-321.

Malone, L. (1987). The Chernobyl Accident: A Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution. *Columbia Journal of Environmental Law, 12*, 203-241.

Mann, N., & Pass, V. (2011). The cultural visualisation of Hurricane Katrina. *Invisible Culture, 16*(Spring), 1-9.

Marcum, C. S., Bevc, C. A., & Butts, C. T. (2012). Mechanisms of Control in Emergent Interorganizational Networks. *Policy Studies Journal, 40*(3), 516-546.

Marcus, G. (2010). Experts, Reporters, Witnesses: The making of anthropologists in states of emergency. In D. Fassin & M. Pandolfi (Eds.), *Contemporary States of Emergency* (pp. 357-378). New York: Zone Books.

Marcus, L., Dorn, B., & Henderson, J. (2006). Meta-leadership and national emergency preparedness: A model to build government connectivity. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, 4*(2), 128-134.

Marcus, L., Dorn, B., Henderson, J., & Ashkenazi, I. (2008). A walk in the woods: a guide for meta-leaders: Program for Health Care Negotiation and Conflict Resolution, Harvard School of Public Health.

Marcus, L., Dorn, B., Henderson, J., & McNulty, E. (2015). Meta-Leadership: A Framework for Building Leadership Effectiveness. National Preparedness Leadership Initiative, Harvard School of Public Health: (3.6.17) https://cdn2.sph.harvard.edu/wp-content/uploads/sites/8/2015/12/Meta-leadership-Overview-Working-Paper-Final.pdf

Markel, M. W., Leonard, H., Lynch, C., Panis, C., Schirmer, P., & Sims, C. (2010). Developing US Army Officers' Capabilities for Joint, Interagency, Intergovernmental, and Multinational Environments: RAND Arroyo Center.

Markenson, D., DiMaggio, C., & Redlener, I. (2005). Preparing health professions students for terrorism, disaster, and public health emergencies: core competencies. *Academic Medicine, 80*(6), 517-526.

Marks, C. A. (2005). Professional Competencies for the Master's Level Emergency Manager: Knowledge Systems Necessary for the Emergency Manager of the 21st century: Blue Horizons LLC / FEMA (3.6.17) https://training.fema.gov/hiedu/emcompetencies.aspx.

Marques-Quinteiro, P., Curral, L., Passos, A. M., & Lewis, K. (2013). And now what do we do? The role of transactive memory systems and task coordination in action teams. *Group Dynamics: Theory, Research, and Practice, 17*(3), 194.

Marsh, G. (1999). The community of circumstance—a tale of three cities: community participation in St Kilda, Knox, and Lewisham. In D. Chekki (Ed.), *Research in Community Sociology* (pp. 65-88). Greenwich CT: Jai Press.

May, A. (2006). *First Informers in the Disaster Zone: The Lessons of Katrina.* Paper presented at the Aspen Institute Disaster Communications Project: Katrina's Lessons, Queenstown, Maryland.

Mayer, B., Moss, J., & Dale, K. (2008). Disaster and Preparedness: Lessons from Hurricane Rita. *J of Contingencies and Crisis Management, 16*(1), 14-23.

Maynard-Moody, S., & Musheno, M. (2000). State Agent or Citizen Agent: Two Narratives of Discretion. *Journal of Public Administration Research and Theory: J-PART, 10*(2), 329-358.

McCausland, J. (2008). Developing strategic leaders for the 21st century. Strategic Studies Institute: US Army War College.

McClure, J., H. Doyle, E. E., & Velluppillai, J. M. (2015). A tale of two cities: judgments about earthquake and aftershock probabilities across time windows. *International journal of disaster risk reduction, 14, Part 1*, 15-26.

McCormack, B. (2011). Engaged scholarship and research impact: integrating the doing and using of research in practice. *Journal of Research in Nursing, 16*(2), 111-127.

McCreight, R. (2009). Educational challenges in homeland security and emergency management. *J of Homeland Security and Emergency Management, 6*(1).

McCreight, R. (2014). A pathway forward in Homeland Security education: An Option Worth Considering and the challenge ahead. *J of Homeland Security & Emergency Management, 11*(1), 25-38.

McEntire, D. (2004, June 8 2004,). *The Status of Emergency Management Theory: Issues, Barriers, and Recommendations for Improved Scholarship.* Paper presented at the FEMA Higher Education Conference, Emmitsburg MD.

McEntire, D. (2007). The Importance of Multi- and Interdisciplinary Research on Disasters and for Emergency Management. In D. McEntire (Ed.), *Disciplines, Disasters and Emergency Management: The Convergence and Divergence of Concepts, Issues, and Trends in the Research Literature* (pp. 3-14). Springfield IL: C.C. Thomas.

McGranahan, G., Balk, D., & Anderson, B. (2007). The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones. *Environment & Urbanisation, 19*(1), 17-37.

McGrath, B., & Pickett, S. (2011). The Metacity: A Conceptual Framework for Integrating Ecology and Urban Design. *Challenges, 2*, 55-72.

McGuire, M., & Schneck, D. (2010). What if Hurricane Katrina Hit in 2020? The Need for Strategic Management of Disasters. *Public Administration Review, December 2010: Special Issue*, S201-S207.

McKittrick, D., & McVea, D. (2001). *Making Sense of the Troubles*. London: Penguin.

McLean, C., Wallace, D., Soppitt, S., Parrish, W., Silander, D., & Irving, A. (2011). *Developing a transatlantic understanding in homeland security academic education provision: The emergence of a new academic discipline*. Paper presented at the ISA Annual Convention, Montreal.

McLennan, B., Whittaker, J., & Handmer, J. (2016). The changing landscape of disaster volunteering: opportunities, responses and gaps in Australia. *Natural Hazards*, 1-18.

McNabb, S. (1995). Social research and litigation: good intentions versus good ethics. *Human Organisation, 54*, 331-335.

McNulty, E. (2013). Mastering High-Stakes Meta-Leadership: National Preparedness Leadership Initiative: (3.6.17) http://docplayer.net/5551788-Mastering-high-stakes-meta-leadership.html

McQuaid, J., & Schleifstein, M. (2002, 23-27.6.2002). Washing Away: Worst-case scenarios if a hurricane hits Louisiana. *Times-Picayne*.

Meadows, D., Meadows, D., Rangers, J., & Behrens, W. (1972). *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. London: Pan.

Meier, P. (2012). Crisis mapping in action: How open source software and global volunteer networks are changing the world, one map at a time. *Journal of Map & Geography Libraries, 8*(2), 89-100.

Meier, P., & Munro, R. (2010). The unprecedented role of SMS in disaster response: Learning from Haiti. *SAIS Review of International Affairs, 30*(2), 91-103.

Melzer, N. (2009). Interpretive Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law. Geneva, International Committee of the Red Cross: (3.6.17)
https://www.icrc.org/eng/assets/files/other/icrc-002-0990.pdf

Mendoca, D., & Wallace, W. (2007). A cognitive model of improvisation in emergency management. *IEEE Transactions on Systems, Man and Cybernetics, 37*(4), 547-561.

Mendonca, D., & Wallace, W. A. (2004). Studying organizationally-situated improvisation in response to extreme events. *International Journal of Mass Emergencies and Disasters, 22*(2), 5-30.

Mendonça, D., Jefferson, T., & Harrald, J. (2007). Emergent Interoperability: collaborative adhocracies and mix-and-match technologies in emergency management. *Communications of the ACM, 50*(3), 44-49.

Mendonca, S., Pina e Cunha, M., Kaivo-oja, J., & Ruff, F. (2004). Wild cards, weak signals and organisational improvisation. *Futures, 36*, 201-218.

Menoni, S., Bonadonna, C., Szarzynski, J., Frischknecht, C., Ballio, F., Di Prisco, M., . . . Jordaan, A. (2014). Higher Education curricula aimed at training disaster risk managers of the future *Prepared for the Global Assessment Report on Disaster Risk Reduction 2015*: UN ISDR.

Michaels, S. (2003). Perishable Information, Enduring Insights? Understanding Quick Response Research. In J. Monday (Ed.), *Beyond September 11th: An Account of Post-Disaster Research*. Boulder: University of Colorado.

Mikusova, M. (2011). Changes in the Research of Crisis. *Int J of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 5*(8), 979-983.

Milašinović, S., & Kešetović, Ž. (2008). Crisis and Crisis Management – A Contribution to a Conceptual & Terminological Delimitation. *Megatrend Review, 5*(1).

Millar, D., & Heath, R. (Eds.). (2004). *Responding to Crisis: A Rhetorical Approach to Crisis Communication*: Lawrence Erlbaum Associates.

Miller, A., & Goidel, R. (2009). News Organisations and Information Gathering during a Natural Disaster: Lessons from Hurricane Katrina. *J of Contingencies and Crisis Management, 17*(4), 366-273.

Miller, H., McNamara, J., & Jui, J. (2005). Hurricane Katrina - After Action Report: New Orleans Airport 31 August to 10 September 2005 *DMAT*.

Milliman, J., Grosskopf, J., & Paez, O. E. (2006). An exploratory study of local emergency managers' views of military assistance/defense support to civil authorities (MACA/DSCA). *Journal of Homeland Security and Emergency Management, 3*(1).

Mills, C. W. (1956, 2000). *The Power Elite*. New York: Oxford University Press.

Milne-Henderson, S. (1992). Britain at risk: accountability and quality control in disaster management. In D. Parker & J. Handmer (Eds.), *Hazard Management and Emergency Planning: Perspectives on Britain* (pp. 43-53). London: James & James.

Milojevic, I., & Innayatullah, S. (2015). Narrative foresight. *Futures, 73*, 151-162.

Mishra, J., Allen, D., & Pearman, A. (2011). Information sharing during multi-agency major incidents. *Proceedings of the American Society for Information Science and Technology, 48*(1), 1-10.

Mitroff, I. (2005). *Why Some Companies Emerge Stronger and Better from a Crisis*: American Management Association.

Mitroff, I., Alpaslan, M., & Green, S. (2004). Crises as Ill-Structured Messes. *International Studies Review, 6* (*The Forum*), 175-182.

MoD. (2016). 2015 to 2020 government policy: Military Aid to the Civil Authorities for activities in the UK. London: Ministry of Defence.

Molina, M. J., & Rowland, F. S. (1974). Stratospheric sink for chlorofluoromethanes: chlorine atom-catalysed destruction of ozone. *Nature, 249*((28 June 1974)), 810-812.

Montgomery, H., Lipshitz, R., & Brehmer, B. (2004). *How Professionals make Decisions*: CRC Press.

Mordaunt, P. M. (2014 (11.11.2014)). *Developing Blue Light partnerships and increasing interoperability*. Paper presented at the Blue Light Innovation 2014 conference, London.

Morris, J., Morris, E., & Jones, D. (2007). Reaching for the Philosopher's Stone: Contingent Coordination and the Military's Response to Hurricane Katrina. *Public Administration Review, Special Issue*, 94-106.

Morss, R. E., Wilhelmi, O. V., Downton, M. W., & Gruntfest, E. (2005). Flood risk, uncertainty, and scientific information for decision making: lessons from an interdisciplinary project. *Bulletin of the American Meteorological Society, 86*(11), 1593.

Moseley, L. (2004). Educational Needs for Disaster Management. *Australian Journal of Emergency Management, 19*(4).

Moser, S., Williams, S. J., & Boesch, D. (2012). Wicked Challenges at Land's End: Managing Coastal Vulnerability Under Climate Change. *Annual Review Environmental Resources, 37*, 51-78.

Moynihan, D. (2007). From Forest Fires to Hurricane Katrina: Case Studies of Incident Command Systems: IBM Center for the Business of Government.

Moynihan, D. (2008). Learning under uncertainty: networks in crisis management. *Public Administration Review, 68*(2), 350-365.

Moynihan, D. (2009). From Intercrisis to Intracrisis Learning. *Journal of Contingencies and Crisis Management, 17*(3), 189-198.

Moynihan, D. (2009). The network governance of crisis response: case studies of incident command systems. *Journal of Public Administration Research and Theory, 19*, 895–915.

Moynihan, D. (2009). The Response to Hurricane Katrina. Geneva: International Risk Governance Council.

Moynihan, D. (2012). A Theory of Culture-Switching: Leadership and Red-Tape during Hurricane Katrina. *Public Administration, 90*(4), 851-868.

Mueller, N. (2013). *OECD Principle 4*. Paper presented at the OECD High Level Risk Forum, Paris.

Muffet-Willett, S. (2010). *Waiting for a crisis: Case studies of crisis leaders in Higher Education.* (Doctor of Education), University of Akron.

Mutch, C., & Marlowe, J. (2013). Lessons from disaster: the power and place of story. *Disaster Prevention and Management, 22*(5), 385-394.

Nagai, T. (1951). *We of Nagasaki: the study of survivors in an atomic wasteland*. New York: Duell, Sloan & Pearce.

Naisbit, J. (1982). *Megatrends: Ten New Directions Transforming Our Lives*. New York: Warner Books.

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1979). The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. Washington DC: Department of Health, Education, and Welfare

National Counter Terrorism Security Office (2014). Working with counter-terrorism security advisers: (3.6.17)
https://www.gov.uk/government/publications/counter-terrorism-support-for-businesses-and-communities/working-with-counter-terrorism-security-advisers

National Hurricane Centre. (2005). Hurricane Katrina. National Oceanic and Atmospheric Administration: (3.6.17)
http://www.nhc.noaa.gov/archive/2005/pub/al122005.public.024.shtml

National Prisons Project. (2006). Abandoned & Abused: Orleans Parish Prisoners in the Wake of Hurricane Katrina. American Civil Liberties Union: (4.6.17)
https://www.aclu.org/news/aclu-report-details-horrors-suffered-orleans-parish-prisoners-wake-hurricane-katrina

National Prisons Project. (2007). Abandoned and abused: prisoners in the wake of Hurricane Katrina. *Race & Class, 49*(1), 81-92.

National Research Council. (2002). *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*. Washington DC: National Academies Press:

4.6.17) http://www.nap.edu/catalog/10415/making-the-nation-safer-the-role-of-science-and-technology

National Research Council. (2013). Climate and Social Stress: Implications for Security Analysis. Committee on Assessing the Impacts of Climate Change on Social and Political Stresses. In J. Steinbruner, P. Stern, & J. Husbands (Eds.). Washington, DC: Board on Environmental Change and Society, Division of Behavioral and Social Sciences and Education. The National Academies Press.

NATO. (2013). Allied Joint Doctrine for Civil-Military Cooperation: (4.6.17) https://www.gov.uk/government/publications/civil-military-co-operation

Neville-Jones, B. (2009). [Parliamentary Question: Government Departments: Counterterrorism].

New, B. (1992). Too Many Cooks? The response of the health-related services to major incidents in London (Research Report 15). London: King's Fund Institute.

Newton, A., Carruthers, T., & Icely, J. (2011). The coastal syndromes and hotspots on the coast. *Estuarine, Coastal and Shelf Science, 96*, 39-47.

Nicholls, R. J. (1995). Coastal megacities and climate change. *GeoJournal, 37*, 369-379.

Nicholls, R. J. (2007). IPCC Climate Change 2007: Impacts, Adaptation and Vulnerability (pp. 315-356).

Nickel, P., & Eikenberry, A. (2007). Responding to "Natural" Disasters: The Ethical Implications of the Voluntary State. *Administrative Theory & Praxis, 29*(4), 534-545.

Nitze, P. (1956). Atoms, strategy and policy. *Foreign Affairs, 34*(2), 187-198.

Norman, S., & Cole, E. (2003). Order out of chaos? A critical review of the role of central, regional, and local Government in emergency planning in London. *Australian Journal of Emergency Management, 18*(2).

Norris, F., Stevens, S., Pfefferbaum, B., Wyche, K., & Pfefferbaum, R. (2008). Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness. *American J Community Psychology, 41*, 127-150.

Nowell, B., Bodkin, C., & Bayoumi, D. (2017). Redundancy as a strategy in disaster response systems: A pathway to resilience or a recipe for disaster? *J of Contingencies and Crisis Management, 25*(3), 123-135.

Nye, J. (2004). *Power in the global information age: From realism to globalization*. London: Routledge.

O'Mathúna, D. P. (2010). Conducting research in the aftermath of disasters: ethical considerations. *Journal of Evidence-Based Medicine, 3*(2), 65-75.

O'Brien, G. (2008). UK emergency preparedness: a holistic local response? *Disaster Prevention & Management, 17*(2), 232-243.

O'Brien, G., & Read, P. (2005). Future UK emergency management: new wine, old skin. *Disaster Prevention & Management, 14*(3), 353-361.

O'Brien, M. (2005). CNN: Miles O'Brien's hurricane blog. CNN International: (4.6.17) http://edition.cnn.com/2005/WEATHER/08/28/hurricane.blog/

O'Connor, M. (2005). *From Chaos to Clarity: Educating Emergency Managers.* (EdD), University of Akron, Akron.

Odlund, A. (2010). Pulling the Same Way? A Multi-Perspective Study of Crisis Cooperation in Government. *J of Contingencies and Crisis Management, 18*(2), 96-107.

OECD. (2011). Future Global Shocks: Improving Risk Governance. Paris: Organisation for Cooperation and Development.

OECD. (2014). *Recommendation of the Council on the Governance of Critical Risks*. Paris: OECD.

Okie, S. (2008). Dr Pou and the Hurricane — Implications for Patient Care during Disasters. *New England Journal of Medicine, 358*(1), 1-5.

Olejarski, A., & Garnett, J. (2010). Coping with Katrina: Assessing Crisis Management Behaviours in the Big One. *J of Contingencies and Crisis Management, 18*(1), 26-38.

Osborn, R., Hunt, J., & Jauch, L. (2002). Toward a contextual theory of leadership. *The Leadership Quarterly, 13*, 797-837

Ospina, S. M., & Dodge, J. (2005b). Narrative inquiry and the search for connectedness: Practitioners and academics developing public administration scholarship. *Public Administration Review, 65*(4), 409-423.

Ostertag, S. F., & Ortiz, D. G. (2015). "Katrina Bloggers Activate!": The Long-Term Effects of Digital Media on Civic Participation. *Sociological Inquiry, 85*(1), 28-54.

Ostertag, S. F., & Tuchman, G. (2012). When innovation meets legacy: citizen journalists, ink reporters, and television news. *Information, Communication & Society, 15*(6), 909-931.

O'Sullivan, T., & Ramsay, J. (2015). Defining and Distinguishing Homeland from National Security and Climate-Related Environmental Security, in Theory and Practice. *J of Homeland Security & Emergency Management, 12*(1), 43-66.

O'Toole, B. J. (1993). Editorial the loss of purity: the corruption of Public Service in Britain. *Public Policy and Administration, 8*(2), 1-6.

Owen, C., Scott, C., Adams, R., & Parsons, D. (2015). Leadership in crisis: developing beyond command and control. *Australian J of Emergency Management, 30*(3), 15-19.

Paglia, E. (2015). Not a proper crisis. *The Anthropocene Review, 2*(3), 247-261.

Palmstierna, H. (1972). The Future Imperative for the Human Environment. New York: United Nations Centre for Social and Economic Information.

Palys, T., & Lowman, J. (2002). 1. Anticipating Law: Research Methods, Ethics, and the Law of Privilege. *Sociological Methodology, 32*(1), 1-17.

Pan, S., & Tan, B. (2011). Demystifying case research: A structured-pragmatic-situational (SPS) approach to conducting case studies. *Information and Organisation, 21*, 161-176.

Parker, C., & Paglia, E. (2012). Hurricane Katrina: The Complex Origins of a Mega-Disaster. In I. Helsloot, A. Boin, B. Jacobs, & L. Comfort (Eds.), *Mega-Crisis* (pp. 51-65). Springfield, Illinois USA.

Parker, C., Stern, E., Paglia, E., & Brown, C. (2009). Preventable Catastrophe? The Hurricane Katrina disaster revisited. *J of Contingencies and Crisis Management, 17*(4), 206-220.

Parker, D. (1992). The mismanagement of hazards. In D. Parker & J. Handmer (Eds.), *Hazard Management and Emergency Planning: Perspectives on Britain*. London: James & James Scientific Publishers.

Parker, D., & Handmer, J. (Eds.). (1992). *Hazard Management and Emergency Planning: Perspectives on Britain*. London: James and James.

Parker, S. (2013). The legal definitions of 'First Responder' *Research Results Digest 385*. Transportation Research Board, National Academies: (4.6.17) http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_385.pdf

Pastor, M., Bullard, R., Boyce, J., Fothergill, A., Morello-Frosch, R., & Wright, B. (2006). In the Wake of the Storm: Environment, Disaster, and Race after Katrina. New York: Russell Sage Foundation.

Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods* (3rd ed.): Sage.

Patton, P., & Pawar, M. (2012). New clinical executive models: one system's approach to chief nursing officer–chief medical officer co-leadership. *Nursing administration quarterly, 36*(4), 320-324.

Pearce, C., & Conger, J. (2003). *Shared Leadership: Reframing the hows and whys of leadership*. Thousand Oaks CA: Sage.

Pearce, T., & Fortune, J. (1995). Command and control in policing: a systems assessment of the Gold, Silver and Bronze structure. *J of Contingencies and Crisis Management, 3*(3), 181-187.

Pearson, C. M., & Clair, J. A. (1998). Reframing crisis management. *Academy of Management Review, 23*(1), 59-76.

Peek, L., & Weber, L. (Eds.). (2012). *Displaced: Life in the Katrina Diaspora*: University of Texas Press.

Pelfrey, W., & Kelley, W. (2013). Homeland security education: a way forward. *Homeland Security Affairs, 9*(Feb), Article 3.

Pelling, M., & Blackmore, S. (Eds.). (2013). *Megacities and the Coast*: Routledge.

Perdikou, S., Horak, J., Halounová, L., Palliyaguru, R., & Lees, A. (2016). The capacity of European Higher Educational Institutions to address threats imposed by natural hazards. *Natural Hazards, 81*(3), 1447-1466.

Perry, R. W. (2004). Disaster Exercise Outcomes for Professional Emergency Personnel and Citizen Volunteers. *Journal of Contingencies and Crisis Management, 12*(2), 64-75.

Perry, R., & Lindell, M. (2003). Preparedness for Emergency Response: Guidelines for the Emergency Planning Process. *Disasters, 27*(4), 336-350.

Perry, R., & Quarantelli, E. (Eds.). (2005). *What is a disaster? New Answers to Old Questions*: International Research Committee on Disasters.

Pescaroli, G., & Alexander, D. (2015). A definition of cascading disasters and cascading effects: Going beyond the "toppling dominos" metaphor. *Planet@Risk, 3*(1), 59-67.

Pescaroli, G., & Kelman, I. (2016). How critical infrastructure orients international relief in cascading disasters. *J of Contingencies and Crisis Management*.

Pescosolido, A. (2002). Emergent leaders as managers of group emotion. *The Leadership Quarterly, 13*(5), 583-599.

Phelps, R. (2011). *Emergency Management Exercises: From Response to Recovery*. San Fransisco CA: Chandi Media.

Phillips (Lord), N., Bridgeman, J., & Ferguson-Smith, M. (2000). Evidence and supporting papers of the inquiry into the emergence and identification of Bovine Spongiform Encephalopathy (BSE) and variant Creutzfeldt– Jakob disease (vCJD) and the action taken in response to it up to 20 March 1996. The BSE Inquiry: London: HMSO.

Phillips, B. (2005). Disaster as a Discipline: The Status of Emergency Management Education in the U.S. *International Journal of Mass Emergencies and Disasters, 23*(1), 111-140.

Phillips, D. (2003). *Character in Action: The US Coast Guard on Leadership*. Annapolis MD: Naval Institute Press.

Phillips, S., Knebel, A., & Johnson, K. (Eds.). (2009). *Mass Medical Care with Scarce Resources: The Essentials.* Rockville, MD: Agency for Healthcare Research and Quality.

Picou, J. S. (1996). Compelled disclosure of scholarly research: some comments on high stakes litigation. *Law & Contemp. Probs., 59*, 149.

Picou, J. S. (2009). Katrina as a Natech Disaster: Toxic Contamination and Long-Term Risks for Residents of New Orleans. *J of Applied Social Science, 3*, 39-55.

Picou, J. S., & Marshall, B. (2007). Katrina as paradigm shift: reflections on disaster research in the twenty-first century. In D. Brunsma, D. Overfelt, & J. S. Picou (Eds.), *The Sociology of Katrina*. Lanham, Maryland: Rowman & Littlefield.

Pina e Cunha, M., Vieirra da Cunha, J., & Karmoche, k. (1999). Organisational improvisation: what, when, how and why. *International Journal of Management Reviews, 1*(3), 299-341.

Pine, T. G. (1995). Integrated emergency management: hierarchy or network? In T. Horlick-Jones, A. Amendola, & R. Casale (Eds.), *Natural Risk and Civil Protection* (pp. 494-501): E&FN Spon.

Pipa, T. (2006). Weathering the Storm: The Role of Local Non-profits in the Hurricane Katrina Relief Effort. The Aspen Institute: (4.6.17) https://assets.aspeninstitute.org/content/uploads/files/content/docs/NSPPNonprofits%2520and%2520Katrina.pdf

Pitt, M. (2008). Summer Floods 2007: Final Report. London: TSO.

Pollock, K., & Coles, E. (2015). Interoperability: Theory and Practice in UK Emergency Management. Emergency Planning College, UK: Serco

Polman, L. (2011). *The Crisis Caravan: What's Wrong with Humanitarian Aid*. USA: Picador.

Polson, C., Persyn, J., & Cupp, O. (2010). Partnership in progress: a model for development of a Homeland Security graduate degree program. *Homeland Security Affairs, VI* (2) May.

Porche, D. (2009). *Emergent leadership during a natural disaster: a narrative analysis of an acute health care organization's leadership.* (PhD), Capella University.

Porfiriev, B. (1998). *Disaster Policy and Emergency Management in Russia*. New York: Nova Science Publishers Inc.

Potts, A., Bednarek, M., & Caple, H. (2015). How can computer-based methods help researchers to investigate news values in large datasets? A corpus linguistic study of the construction of newsworthiness in the reporting on Hurricane Katrina. *Discourse & Communication, 9*(2), 149-172.

Powley, E., & Taylor, S. (2014). Pedagogical Approaches to Develop Critical Thinking and Crisis Leadership. *J of Management Education, 38*(4), 560-585.

Preston, T. (2008). Weathering the politics of responsibility and blame: The Bush administration and its response to Hurricane Katrina. In A. Boin, A. McConnell, & P. 't Hart (Eds.), *Governing after Crisis: The Politics of Investigation, Accountability and Learning* (pp. 33-61): Cambridge University Press.

Price, S. (undated). The US Coast Guard & Hurricane Katrina. US Coast Guard: (4.6.17) http://www.uscg.mil/history/katrina/docs/DarkestDay.pdf

Prime Minister's Office. (2016). COBR meeting on the attempted coup in Turkey: 16 July 2016 [Press release]

Prior, T., & Roth, F. (2013). Disaster, Resilience and Security in Global Cities. *J of Strategic Security, 6*(2), 59-69.

Pursianen, C. (2008). *Early Warning and Civil Protection*: Nordic Centre for Spatial Development.

QAA. (2008). The Framework for Higher Education in England, Wales and Northern Ireland. Gloucester: The Quality Assurance Agency for Higher Education.

QAA. (2010). Master's degree characteristics. Gloucester: The Quality Assurance Agency for Higher Education.

Quarantelli, E. L. (1982). Inventory of disaster field studies in the social and behavioural sciences 1919-1979. Disaster Research Center: University of Delaware.

Quarantelli, E. L. (1987). *Criteria which could be used in assessing disaster preparedness planning and managing* University of Delaware Disaster Research Center http://udspace.udel.edu/bitstream/handle/19716/495/PP122.pdf;sequence=3

Quarantelli, E. L. (1993). Converting disaster scholarship into effective disaster planning and managing: possibilities and limitations. *International Journal of Mass Emergencies and Disasters, 11*(1), 15-39.

Quarantelli, E. L. (1997). Ten Criteria for Evaluating the Management of Community Disasters. *Disasters, 21*(1), 39-56. doi:10.1111/1467-7717.00043

Quarantelli, E. L. (2000). Emergencies, disaster and catastrophes are different phenomena (Vol. Preliminary paper 304). University of Delaware Disaster Research Center.

Quarantelli, E. L. (2002). The Disaster Research Centre Field Studies of Organised Behaviour in the crisis time period of disasters. In R. A. Stallings (Ed.), *Methods of Disaster Research*: International Research Committee.

Quarantelli, E. L. (2006). Catastrophes are Different from Disasters: Some Implications for Crisis Planning and Managing Drawn from Katrina. (4.6.17) http://understandingkatrina.ssrc.org/Quarantelli

Quarantelli, E. L. (2009). The earliest Interest in disasters and crises, and the early social science studies of disasters, as seen in a sociology of knowledge perspective. University of Delaware: Disaster Research Center.

Quarantelli, E. L. (Ed.) (1998). *What is a Disaster? Perspectives on the Question*. London: Routledge.

Quarantelli, E. L., & Dynes, R. (1977). Different types of organisations in disaster responses and their operational problems. University of Delaware DRC.

Quarantelli, E. L., & Dynes, R. (1977). Response to social crisis and disaster. *American Review of Sociology, 3*, 23-49.

Radaelli, C. M. (2004). Europeanisation: Solution or problem? *European integration online papers (EIoP), 8*(16).

Rahm, D., & Reddick, C. (2011). US city managers' perceptions of disaster risk: consequences for urban emergency management. *J of Contingencies and Crisis Management, 19*(3), 136-146.

Rake, E., & Nja, O. (2009). Perceptions and performances of experienced incident commanders. *Journal of Risk Research, 12*(5), 665-685.

Raleigh, C., & Urdal, H. (2007). Climate change, environmental degradation and armed conflict. *Political Geography, 26*, 674-694.

Ramsay, J., & O'Sullivan, T. (2013). There's a pattern here: the case to integrate Environmental Security into Homeland Security strategy. *Homeland Security Affairs, 9*(Article 6).

Ranck, A. (2012). Exploring the Implementation of New Public Service Role within Disaster Management. Montana State University.

Redlener, I., & Culp, D. (2010). Climate change and the public's health: the coming crisis for the U.S. Gulf Coast: Columbia University Academic Commons, (4.6.17) http://hdl.handle.net/10022/AC:P:14795

Reed, G., Bullis, C., Collins, R., & Paparone, C. (2004). Mapping the Route of Leadership Education: Caution Ahead. *Parameters, US Army War College Quarterly, 34*(3), 46-60.

Reflection Group on the Future of the EU 2030. (2010). Project Europe 2030: Challenges and Opportunities. Brussels: A Report to the European Council by the Reflection Group on the Future of the EU 2030.

Regester, M., & Larkin, J. (2005). *Risk Issues and Crisis Management.* (3rd ed.). London: Kogan Page.

Rego, L., & Garau, R. (2007). Stepping into the Void: Reflections and insights from a forum on Crisis Leadership convened at the Center for Creative Leadership March 13–15, 2007: Centre for Creative Leadership.

Remote Control Project. (2014). *Floating armouries: implications and risks*. Oxford Research Group.

Rhinard, M., & Sundelius, B. (2010). The Limits of Self-Reliance: International Cooperation as a Source of Resilience. In C. Louise, A. Boin, & C. Demchak (Eds.), *Designing Resilience: Preparing for Extreme Events*: University of Pittsburgh Press.

Rhodes, R. A. W. (1994). The hollowing out of the state: the changing nature of the public service in Britain. *Political Quarterly, 65*(2), 138-151.

Riccio, G., Sullivan, R., Klein, G., Salter, M., & Kinnison, H. (2004). *Warrior Ethos: Analysis of the concept and initial development of applications*. (4.6.17) http://www.dtic.mil/docs/citations/ADA428065

Richard, A. (2006, 30.8.2006). Katrina aid: When the world wanted to help America. *New York Times*.

Richards, S. (1996). New Labour - New Civil Service? *The Political Quarterly, 67*(4), 311-320.

Richardson, R., Plummer, C., Barthelemy, J., & Cain, D. (2009). Research after natural disasters: recommendations and lessons learned. *Journal of Community Engagement and Scholarship, 2*(1), 3-11.

Rickards, L., Wiseman, J., & Kashima, Y. (2014). Barriers to effective climate change mitigation: the case of senior government and business decision makers. *Wiley Interdisciplinary Reviews: Climate Change, 5*(6), 753-773.

Rieckmann, M. (2012). Future-oriented higher education: Which key competencies should be fostered through university teaching and learning? *Futures, 44*, 127-135.

Riley, M., & Harvey, D. (2007). Talking geography: on oral history and the practice of geography. *Social and Cultural Geography, 8*(3), 345-351.

Ritchie, L., & Gill, D. (2007). Guest Editorial: Voices of Katrina. *J of Public Management & Social Policy, Fall*, 1-4.

Rittel, H., & Webber, M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences, 4*, 155-169.

Ritzer, G. (1975). Sociology: A multiple paradigm science. *The American Sociologist, 10*(3), 156-167.

Robbins, I. (2008). Lessons from Hurricane Katrina: Prison emergency preparedness as a constitutional imperative. *Michigan Journal of Law Reform, 42*(1), 1-69.

Roberts, G. (1978). The explanation of politics: comparison, strategy and theory. In P. Lewis, D. Potter, & F. Castles (Eds.), *The Practice of Comparative Politics: Aeader* (pp. 287-304). London: Longman.

Roberts, K., & LaPorte, T. (1989). *High reliability Organisations: the Berkeley Project.* Paper presented at the Second Conference on Industrial and Organisational Crisis Management, New York.

Robinson, E. (2016). No Confidence: Confidentiality, Ethics and the Law of Academic Privilege. *Communication Law and Policy, 21*(3), 323-381.

Rodriguez, H., Trainor, J., & Quarantelli, E. (2006). Rising to the Challenges of a Catastrophe: The Emergent and Prosocial Behavior following Hurricane Katrina. *Annals of the American Academy of Political and Social Science, 604*, 82-102.

Roe, E. (2011). Surprising answers to rising sea levels, storms, floods, desertification, earthquakes and ever more environmental crises in California's Sacramento-San Joaquin Delta. *J of Contingencies and Crisis Management, 19*(1), 34-42.

Rogers, A. (2002). *Teaching Adults* (3rd ed.): Open University Press.

Rogers, P. (2011). Resilience and civil contingencies: tensions in northeast and northwest UK (2000—2008). *Journal of Policing, Intelligence and Counter Terrorism, 6*(2), 91-107.

Rogers, P. (2013). Rethinking Resilience: Articulating Community and the UK Riots. *Politics, 33*(4), 322-333.

Rojek, J., & Smith, M. (2007). Law Enforcement Lessons Learned from Hurricane Katrina. *Review of Policy Research, 24*(6), 589-608.

Rosenthal, U. (2009). 21st Century Mega-crises: New Challenges to Crisis Management *National Safety & Security and Crisis Management*. NL: Ministry of Interior and Kingdom Relations.

Rosenthal, U., & Kouzmin, A. (1997). Crises and Crisis Management: Toward Comprehensive Government Decision Making. *J of Public Administration Research and Theory, 2*, 277-304.

Rosenthal, U., & 't Hart, P. (1991). Experts and Decision Makers in Crisis Situations. *Knowledge: Creation, Diffusion, Utilisation, 12*(4), 350-372.

Rosenzweig, C., Solecki, W. D., Blake, R., Bowman, M., Faris, C., Gornitz, V., . . . Leichenko, R. (2011). Developing coastal adaptation to climate change in the New York City infrastructure-shed: process, approach, tools, and strategies. *Climatic Change, 106*(1), 93-127.

Roth, M. (2010). Testimony to the House Committee on Homeland Security, Subcommittee on Emergency Communications, Preparedness, and Response: (4.6.17) http://www.fema.gov/pdf/about/odic/written_statement_roth.pdf.

Rubens, D. (2015). *Beyond 'Command & Control': Developing a New Paradigm for Incident Command Systems, Critical Decision Making and 21st Century Crisis Response.* (D.SyRM), Portsmouth University UK. Retrieved from https://researchportal.port.ac.uk/portal/files/5752794/UP641103_David_Rubens_Thesis.pdf

Ruddin, L. (2006). You can generalize stupid! Social Scientists, Bent Flyvbjerg, and Case Study Methodology. *Qualitative Inquiry, 12*, 797-812.

Rudowitz, R., Rowland, D., & Shartzer, A. (2006). Health care in New Orleans before and after Hurricane Katrina *Health Affairs, 25*(5), 395-406.

Rumsfeld, R. (2002, 12.2.2002). [DoD News Briefing - Secretary Rumsfeld and Gen. Myers].

Rust, E., & Killinger, K. (2008). Blue Ribbon Commission on Mega-Catastrophes. Washington DC: The Financial Services Round Table.

Ryan, A., & Tilbury, D. (2013). Flexible Pedagogies: new pedagogical ideas: Higher Education Academy.

Samaan, J., & Verneuil, L. (2009). Civil–Military Relations in Hurricane Katrina: a case study on crisis management in natural disaster response. In J. Streets & D.

Hamilton (Eds.), *Humanitarian Assistance: Improving U.S.-European Cooperation* (pp. 413-434). Center for Transatlantic Relations, The Johns Hopkins University/Global Public Policy Institute.

Sanial, G. (2007). *The Response to Hurricane Katrina: A Study of the Coast Guard's Culture, Organisational Design & Leadership in Crisis.* (MSc), MIT.

Saunders, M., Lewis, P., & Thornhill, A. (2011). *Research methods for business students* (5 ed.): Pearson Education India.

Sausville, P. (2008). *DoD response to natural disasters: why the National Guard is off limits.* (Master of Strategic Studies), US Army War College, Carlisle PA.

Scarman, Lord. (1981). *The Brixton Disorders*, April 10-12 1981: Report of an Inquiry by the Rt. Hon. The Lord Scarman, O.B.E. (Cmnd. 8427). London: Stationery Office.

Schafer, A. (1986). On Using Nazi Data: The Case Against. *Dialogue, XXV*, 413-419.

Schafer, M., & Crichlow, S. (2010). *Groupthink vs High-Quality Decision Making in International Relations*. New York: Columbia University Press.

Schneider, S. (2005). Administrative Breakdowns in the Governmental Response to Hurricane Katrina. *Public Administration Review, 65*(5), 515-516.

Schofield, C., & Arsana, I. M. (2010). *Imaginary Islands? Options to Preserve Maritime Jurisdictional Entitlements and Provide Stable Maritime Limits in the Face of Coastal Instability,* Paper presented at the ABLOS Conference "Contentious Issues in UNCLOS - Surely Not?", Advisory Board on the Law of the Sea, Monaco.

Scholtens, A., Jorritsma, J., & Helsloot, I. (2014). On the need for a paradigm shift in the Dutch command and information system for the acute phase of disasters. *Journal of Contingencies and Crisis Management, 22*(1), 39-51.

Schon, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*: Basic Books.

Schultz, W. (2006). The cultural contradictions of managing change: using horizon scanning in an evidence-based policy context. *Foresight, 8*(4), 3-12.

Schwartz, P., & Randalls, S. (2003). An Abrupt Climate Change Scenario and Its Implications for United States National Security. Pentagon: Global Business Network.

Scott, D., Brown, A., Lunt, I., & Thorne, L. (2004). *Professional Doctorates: Integrating Professional and Academic Knowledge*: Society for Research into Higher Education & OUP.

Scraton, P., Jemphrey, A., & Coleman, S. (1995). No Last Right: The Denial of Justice and the Promotion of Myth in the Aftermath of the Hillsborough Disaster: Liverpool City Council.

Sebastian, I. M., & Bui, T. X. (2009). Emergent groups for emergency response-theoretical foundations and information design implications. *AMCIS 2009 Proceedings*, 638.

Sementelli, A. (2007). Toward a Taxonomy of Disaster and Crisis Theories. *Administrative Theory & Praxis, 29*(4), 497-512.

Senge, P. (2002). Classic work: the leader's new work – building learning organizations. In D. Morey, M. Maybury, & B. Thuraisingham (Eds.), *Knowledge Management: Classical and Contemporary Works.* Cambridge, MA: MIT Press.

Shaluf, I., Ahmadun, F., & Said, A. (2003). A review of disaster and crisis. *Disaster Prevention and Management, 12*(1), 24-32.

Sharkey, P. (2007). Survival and death in New Orleans: An empirical look at the human impact of Katrina. *Journal of Black Studies, 37*(4), 482-501.

Shaw, K., & Maythorne, L. (2011). Managing for local resilience: towards a strategic approach. *Public Policy and Administration, 28*(1), 43-65.

Shimizu, M., & Clark, A. (2015). Interconnected risks, cascading disasters and disaster management policy: a gap analysis. *Planet@Risk, 3*(2).

Shrivastava, P. (1987). *Bhopal, Anatomy of a Crisis*. London: Chapman Publishing.

Shrivastava, P. (1993). Crisis theory/practice: towards a sustainable future. *Organization & environment, 7*(1), 23-42.

Shrivastava, P., Mitroff, I., & Alpaslan, C. (2013). Imagining an Education in Crisis Management. *J of Management Education, 37*(1), 6-20.

Silvia, C., & McGuire, M. (2010). Leading public sector networks: An empirical examination of integrative leadership behaviours. *The Leadership Quarterly, 21*, 264-277.

Simo, G. (2009). Sustaining Cross-Sector Collaborations: Lessons from New Orleans. *Public Organization Review, 9*, 367-384.

Simon, D. (2007). Cities and global environmental change: exploring the links. *The Geographical Journal, 173*(1), 75-92.

Sims, B. (2007). "The Day after the Hurricane": Infrastructure, Order, and the New Orleans Police Department's Response to Hurricane Katrina. *Social Studies of Science, 37*(1), 111-118.

Siriwardena, M., Malalgoda, C., Thayaparan, M., Amaratunga, D., & Keraminiyage, K. (2013). Disaster resilient built environment: role of lifelong learning and the implications for higher education. *International Journal of Strategic Property Management, 17*(2), 174-197.

Sloan, S. (2008). Oral History and Hurricane Katrina: Reflections on Shouts and Silences. *The Oral History Review, 35*(2), 176-186.

Smet, H. d., Lagadec, P., & Leysen, J. (2012). Disasters Out of the Box: A New Ballgame? *J of Contingencies and Crisis Management, 20*(3), 138-148.

Smith, M. (2005). Defense Secretary recognizes Guard's Katrina response: (4.6.17) http://www.nationalguard.mil/News/ArticleView/tabid/5563/Article/572851/defense-secretary-recognizes-guards-katrina-response.aspx

Smithson, A., & Levy, L.-A. (2000). *Ataxia: The Chemical and Biological Terrorism Threat and the US Response*. Stimson Centre: (4.6.17) http://www.stimson.org/books-reports/ataxia-the-chemical-and-biological-terrorism-threat-and-the-us-response/

Snook, S. (2000). *Friendly Fire: The accidental shootdown of US Black Hawks over Iraq*: Princetown University Press.

Souto-Otero, M. (2011). The role of higher education institutions as providers of continuous professional learning and adult education. Brussels: EC.

Sphere Project. (2011). Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response: Sphere Project Board.

Stallings, R. (Ed.) (2002). *Methods of Disaster Research*: International Research Committee on Disasters.

Stallings, R., & Quarantelli, E. (1985). Emergent citizen groups and emergency management. *Public Administration Review, Vol. 45, Special Issue: Emergency Management: A Challenge for Public Administration* (Jan., 1985), 93-100.

Start, D., & Hovland, I. (2004). Tools for Policy Impact: A Handbook for Researchers. London: Overseas Development Institute.

State of Louisiana. (2000). Emergency Operations Plan Supplement 1A: Southeast Louisiana Hurricane Evacuation and Sheltering Plan: (4.6.17) http://www.rightwingbob.com/files/louisiana.pdf

Steffen, W., Crutzen, P., & McNeil, J. (2007). The Anthropocene: Are humans now overwhelming the great forces of nature? *Ambio, 36*, 1317.

Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. (2011). The Anthropocene: conceptual and historical perspectives. *Phil. Trans. R. Soc. A, 369*, 842-867.

Stein, A., & Preuss, G. (2006). Oral history, folklore, and Katrina. In C. Hartman & G. Squires (Eds.), *There is no such thing as a Natural Disaster* (pp. 37-58). New York: Routledge.

Stein, J. (2001). In the Eye of the Storm: Humanitarian NGOs, Complex Emergencies, and Conflict Resolution. *Peace and Conflict Studies, 8*(1), Article 2.

Steinberg, J. L., Sengul, H., & Cruz, A. M. (2008). Natech risk and management: an assessment of the state of the art. *Natural Hazards, 46*, 143-152.

Stern, E. (2000). *Crisis Decisionmaking: A Cognitive-Institutional Approach.* (PhD), Swedish National Defence College, Stockholm.

Stern, E. (2013). *Challenges of Crisis Sensemaking: from warning to response*. Paper presented at the 2nd OECD Workshop on Strategic Crisis Management 19-20 June 2013, Geneva.

Stern, E. (2013). Preparing: The Sixth Task of Crisis Leadership. *Journal of Leadership Studies, 7*(3), 51-56.

Stern, E. (Ed.) (2014). *Designing Crisis Management Training and Exercises for Strategic Leader*. Swedish Defence College: CRISMART.

Stevens, R. (2014). Legal Issues: Five Days at Memorial. Grand Valley State University: (4.6.17) http://www.gvsu.edu/cms4/asset/C36BB20B-9927-1AE9-F5689F4682486302/legal_outline_five_days_final_rss(2).pdf

Stewart, K., & Vocino, J. (2013). Homeland Security in Higher Education: the State of Affairs. *J of Public Affairs Education, 19*(1), 13-29.

Stilgoe, J., & Burall, S. (2013). Windows or doors? Experts, publics and open policy. In R. Doubleday & J. Wilsdon (Eds.), *Future directions for scientific advice in Whitehall* (pp. 92-99). Cambridge, Centre for Science and Policy.

Stilgoe, J., Irwin, A., & Jones, K. (2006). The Received Wisdom: Opening up expert advice. London: Demos (4.6.17) http://www.demos.co.uk/files/receivedwisdom.pdf

Stock, P. (2007). Katrina and Anarchy: A content analysis of a new disaster myth. *Sociological Spectrum, 27*(6), 705-726.

Stogdill, R. (1974). *Handbook of Leadership*. New York: Free Press.

Stratton, S. (2012). Ethics in EMS and Disaster Research. *Prehospital and Disaster Medicine, December 2012*, Editorial.

Sudmeier-Rieux, K. (2014). Resilience – an emerging paradigm of danger or of hope. *Disaster Prevention and Management, 23*(1), 67-80.

Suri, S. N., & Taube, G. (2014). Governance in Megacities: Experiences, Challenges and Implications for International Cooperation *Megacities* (pp. 195-200): Springer.

Sutton, J., Palen, L., & Shklovski, I. (2008). *Backchannels on the front lines: Emergent uses of social media in the 2007 Southern California Wildfire*. Paper presented at the 5th International ISCRAM Conference, Washington DC.

Swaney, D. P., Humborg, C., Emeis, K., Kannen, A., Silvert, W., Tett, P., . . . Nicholls, R. (2012). Five critical questions of scale for the coastal zone. *Estuarine, Coastal and Shelf Science, 96*, 9-21.

Sweet, W., & Park, J. (2014). From the extreme to the mean: Acceleration and tipping points of coastal inundation from sea level rise. *Earth's Future, 2*(10.1002/2014EF000272).

Takeda, M. B., & Helms, M. M. (2006). "Bureaucracy, meet catastrophe": Analysis of Hurricane Katrina relief efforts and their implications for emergency response

governance. *International Journal of Public Sector Management, 19*(4), 397 - 411.

Taleb, N. (2007). *The Black Swan: The Impact of the Highly Improbable*. London: Allen Lane Penguin.

Taleb, N. (2012). *Antifragile: Things that gain from Disorder*. London: Penguin.

Thayaparana, M., Malalgodaa, C., Keraminiyagea, K., & Amaratungab, D. (2014). Disaster Management Education through Higher Education – Industry Collaboration in the Built Environment. *Procedia Economics and Finance, 18*, 651-658.

The 1994 Group. (2012). The Post Graduate Crisis: Policy Report. London: The 1994 Group.

The ice2sea Consortium. (2013). From Ice to High Seas: Sea-level rise and European coastlines. Cambridge UK: British Antarctic Survey: (4.6.17) http://www.ice2sea.eu/wp-content/uploads/sites/27/2013/05/From_Ice_to_High_Seas.pdf.

The Times. (1989, 15.8.1989). Leader, *The Times*.

Thomas, S. (2008). *What is the aim of Foresight in the UK*? Paper presented at the Horizon Scanning Seminar, Government Office for Science.

Thompson, N. (2011). *Crisis Intervention*. Lyme Regis: Russell House.

Thompson, R. (2011). Opinion: Emergency management and disaster resilience education in Australia: How does it stack up internationally? *The Australian Journal of Emergency Management, 26*(4), 3-6.

Thorpe, R., Gold, J., & Lawler, J. (2011). Locating distributed leadership. *International Journal of Management Reviews, 13*, 239-250.

Tidwell M. (2006). *The Ravaging Tide: strange weather, future Katrinas, and the coming death of America's coastal cities.* New York: Free Press.

Tierney, K. (2002). The Field turns Fifty: Social change and the practice of disaster fieldwork. In R. A. Stallings (Ed.), *Methods of Disaster Research*: International Research Committee on Disasters.

Tierney, K. (2008). Hurricane in New Orleans? who knew? Anticipating Katrina and its devastation. *Sociological Inquiry, 78*(2), 179-183.

Tierney, K., & Bevc, C. (2007). Disaster as war; militarism and the social construction of disaster in New Orleans. In D. Brunsma, D. Overfelt, & J. S. Picou (Eds.). *The Sociology of Katrina* (pp. 35-50). Lanham, Maryland: Towman & Littlefield.

Tierney, K., & Trainor, J. (2004). Networks and Resilience in the World Trade Center Disaster (pp. 157-172): National Science Foundation, Earthquake Engineering Research Centers Program.

Tierney, K., Bevc, C., & Kuligowski, E. (2006). Metaphors Matter: Disaster Myths, Media Frames, and Their Consequences in Hurricane Katrina. *Annals of the American Academy of Political and Social Science, 604*, 57-81.

Tight, M. (2010). The curious case of case study: a viewpoint. *Int J of Social Research Methodology, 13*(4), 329-339.

Titmuss, R. (1950). *Problems of Social Policy*. London: HMSO.

Toft, B. (1992). The Failure of Hindsight. *Disaster Prevention and Management, 1*(3), 48-60.

Toft, B., & Reynolds, S. (2005). *Learning from Disasters: A Management Approach* (3rd ed.): Palgrave Macmillan.

Topper, B., & Lagadec, P. (2013). Fractal Crises: A New Path for Crisis Theory and Management. *J of Contingencies and Crisis Management, 21*(1), 4-16.

Townsend, F. (2006). The Federal Response to Hurricane Katrina: Lessons learned. Washington DC: Office of the Assistant to the President for Homeland Security and Counterterrorism.

Townsend, M., & Harris, P. (2004, 22.2.2004). Now the Pentagon tells Bush: climate change will destroy us. *The Observer*.

Tracy, S. (2010). Qualitative Quality: Eight "Big-Tent" Criteria for Excellent Qualitative Research. *Qualitative Inquiry, 16*(10), 837-851.

Tracy, S. (2013). *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact*: Blackwell.

Trainor, J., Barsky, L., & Torres, M. (2006). Disaster realities in the aftermath of Hurricane Katrina: Revisiting the looting myth *Natural Hazards Center Quick Response Report 184 (February)*. University of Delaware.

Tranfield, D., & Starkey, K. (1998). The nature, social organisation and promotion of management research: towards policy. *British Journal of Management, 9*(4), 341-353

Transparency International. (2011). Global Corruption Report: Climate Change: Transparency International: (4.6.17) https://www.transparency.org/news/feature/global_corruption_report_climate_change

Trnka, J., Kemper, T., & Schneiderbauer, S. (2009). Do Expert Teams in Rapid Crisis Response Use Their Tools Efficiently? *Information Systems for Emergency Management,* (pp. 95-119.). Armonk, NY: ME Sharpe.

Tugwell, P., & Knottnerus, J. A. (2015). The new paradigm: from bench to bedside to the translational research valleys of death. *Journal of Clinical Epidemiology, 68*(7), 725-726.

Turner, B. A. (1994). Causes of Disaster: Sloppy Management. *British Journal of Management, 5*, 215-219.

Turoff, M., Hiltz, S., Banuls, V., & Eede, G. (2013). Multiple perspectives on planning for emergencies: An introduction to the special issue on planning and foresight for emergency preparedness and management. *Technological Forecasting & Social Change, 80*, 1647-1656.

Uhl-Bien, M., Marion, R., & McLKelvey. (2007). Complexity leadership theory: shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly, 18*(4), 298-318.

Uhr, C. (2009). *Multi-organisational emergency response management: a framework for further development.* Lund, Lund Netherlands. Retrieved from https://www.msb.se/Upload/Insats_och_beredskap/Ledning_och_samordning/ Christian%20Uhr,%20avhandling.pdf

UK Ministry of Justice. (2009). The Governance of Britain: Review of the Executive Royal Prerogative Powers: Final Report. London, Ministry of Justice: (4.6.17) http://www.peerage.org/genealogy/royal-prerogative.pdf

UK Parliament. (2006). Report into the London Terrorist Attack on 7th July 2005. London: Intelligence and Security Committee (Chair Paul Murphy) Cm 6785 TSO.

UN DPKO-DFS. (2016). Police Command in United Nations Peacekeeping Operations and Special Political Missions: (4.6.17) http://www.challengesforum.org/PageFiles/5250/DPKO-DFS%20Guidelines%20on%20Police%20Command.pdf?epslanguage=en.

UN Habitat. (2010). The State of African Cities 2010: Governance, Inequality and Urban Land Markets. Nairobi: United Nations Human Settlements Programme.

UN HCR. (2015). Global Facts and Figures. UN Refugee Agency: (4.6.17) http://www.unhcr.org.uk/fileadmin/user_upload/pdf/October_2015/PDF_Displ acement_Facts_and_Figures_2014_2.pdf.

UN HCR-OCHA (2014). Joint UNHCR-OCHA Note on mixed situations: Coordination in Practice: (4.6.17) https://www.humanitarianresponse.info/en/system/files/documents/files/joint _unhcr_-_ocha_note_on_mixed_situations.pdf

UN IASC. (1994). Definition of complex emergencies. Geneva: UN Inter-Agency Standing Committee

UN IASC. (2009). Initial Rapid Assessment (IRA) Guidance Notes. Inter-Agency Standing Committee: (3.6.17) http://www.who.int/hac/network/global_health_cluster/ira_guidance_note_ju ne2009.pdf.

UN IASC. (2009). Initial Rapid Assessment (IRA) Guidance Notes: (4.6.17) http://www.who.int/hac/network/global_health_cluster/ira_guidance_note_ju ne2009.pdf

UN IASC. (2015). Emergency Response Preparedness. Inter-Agency Standing Committee: (4.6.17) http://interagencystandingcommittee.org/system/files/emergency_response_preparedness_2015_final.pdf.

UN IASC. (2015). Multi-sector Initial Rapid Assessment Tool. Inter-Agency Standing Committee: (4.6.17) http://interagencystandingcommittee.org/system/files/mira_2015_final.pdf.

UN IPCC. (2012). Special Report on managing the risks of extreme events and disasters to advance climate change adaptation (SREX). Geneva: Intergovernmental Panel on Climate Change.

UN IPCC. (2014). Climate Change 2014 Synthesis Report *Fifth Assessment Synthesis Report*. Geneva: Intergovernmental Panel on Climate Change.

UN ISDR CRED. (2016). 2015 Disasters in Numbers: United Nations Office for Disaster Risk Reduction / Centre for Research on the Epidemiology of Disasters: (4.6.17) http://www.unisdr.org/files/47804_2015disastertrendsinfographic.pdf

UN ISDR. (2009). Terminology on Disaster Risk Reduction. United Nations International Strategy for Disaster Reduction: Geneva.

UN ISDR. (2015). GAR: Global Assessment Report on Disaster Risk Reduction. Geneva: UN ISDR.

UN OCHA. (2006). Guidelines on the use of foreign military and civil defence assets in disaster relief - "Oslo Guidelines": UN OCHA.

UN OCHA. (2012). OCHA on message: General Assembly resolution 46/182. UN Office for the Coordination of Humanitarian Affairs.

UN Secretary-General Kofi Annan. (2005). In Larger Freedom: towards development, security and human rights for all *Report of the Secretary-General of the United Nations for decision by Heads of State and Government in September 2005*. United Nations A/59/2005, paragraph 66: (4.6.17) http://www.un.org/en/events/pastevents/in_larger_freedom.shtml.

UN. (1992). UN Internationally Agreed Glossary of Basic Terms Related to Disaster Management. Geneva: United Nations.

UN. (1998). Aarhus Convention: Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters 1998. UNECE: (4.6.17) http://www.unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf

UN. (2015). GAR: Global Assessment Report on Disaster Risk Reduction. Geneva: UN ISDR.

UN. (2015). Sendai Framework for Disaster Risk Reduction 2015-2030. adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015: (4.6.17) http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf.

UNCLOS. (1982). United Nations Convention on the Law of the Sea. Geneva: UN Office of Legal Affairs: (4.6.17) http://www.un.org/Depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm.

UNHCR. (2015). *Global Facts and Figures* UN Refugee Agency: (4.6.17) http://www.unhcr.org.uk/fileadmin/user_upload/pdf/October_2015/PDF_Displacement_Facts_and_Figures_2014_2.pdf.

US DHS. (2005a). National Response Plan (NRP) *Fact Sheet*. US Department of Homeland Security.

US DHS. (2005b). A Review of the Top Officials 3 Exercise. Washington DC: (4.6.17) https://www.oig.dhs.gov/assets/Mgmt/OIG_06-07_Nov05.pdf

US DHS. (2006). *A Performance Review of FEMA's Disaster Management Activities in Response to Hurricane Katrina*: Office of Inspector General, Department of Homeland Security.

US DHS. (2008). National Incident Management System. Washington DC: (4.6.17) https://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf.

US DHS. (2010). Bottom-Up Review Report. Washington DC: US Department of Homeland Security.

US DHS. (2010). Quadrennial Homeland Security Review 2010. Department of Homeland Security: (4.6.17) http://www.dhs.gov/publication/2010-quadrennial-homeland-security-review-qhsr

US DHS. (2011). National Preparedness Goal. Washington DC: US Department of Homeland Security.

US DHS. (2014). Quadrennial Homeland Security Review. US Department of Homeland Security.

US DOD. (2012). Domestic Joint Task Force Commander Handbook. Washington: Department of Defence.

US GAO. (1999). *Combating Terrorism: Need for Comprehensive Threat and Risk Assessments of Chemical and Biological Attacks*. Washington DC: United States General Accounting Office.

US GAO. (2006a). Hurricane Katrina: GAO's Preliminary Observations Regarding Preparedness, Response, and Recovery. Washington: United States Government Accountability Office.

US GAO. (2006b). Catastrophic Disasters: Enhanced Leadership, Capabilities, and Accountability Controls Will Improve the Effectiveness of the Nation's Preparedness, Response, and Recovery System *GAO-06-618*: US Government Accountability Office.

US GAO. (2006c). Coast Guard: Observations on the Preparation, Response, and Recovery Missions Related to Hurricane Katrina. Washington DC: Government Printing Office.

US Government. (2005). USA Hurricane Katrina: What government is doing 21 Nov 2005 [Press release]

US House of Representatives. (2006). A Failure of Initiative: Final Report of the Select Bipartisan Committee to investigate the Preparation for and Response to Hurricane Katrina. Washington DC: US Government Printing Office: (4.6.17) https://www.gpo.gov/fdsys/pkg/CRPT-109hrpt377/pdf/CRPT-109hrpt377.pdf.

US House Select Bipartisan Committee to investigate the Preparation for and Response to Hurricane Katrina. (2006). A Failure of Initiative: Final Report Washington DC: US Govt Printing Office.

US HSPD-8. (2003). Homeland Security Presidential Directive / HSPD-8: Subject: National Preparedness. The White House: (4.6.17) https://fas.org/irp/offdocs/nspd/hspd-8.html

US National Commission on Terrorist Attacks upon the United States. (2011). The 9/11 Commission Report *Final Report of the National Commission on Terrorist Attacks upon the United States* (Authorized ed.). New York: Norton.

US Senate Committee on Homeland Security and Governmental Affairs. (2006). Hurricane Katrina: A National Still Unprepared (Executive Summary). Washington DC: Senate Committee on Homeland Security and Governmental Affairs.

US Senate. (2005). Always Ready: The Coast Guard's Response to Hurricane Katrina *Report of the Senate Committee on Homeland Security and Governmental Affairs,* Washington DC: US Government Printing Office.

US Senate. (2006a). Hurricane Katrina: A National Still Unprepared: *Special Report of the Committee on Homeland Security and Governmental Affairs*. Washington DC: US Government Printing Office: (4.6.17) https://www.gpo.gov/fdsys/pkg/CRPT-109srpt322/pdf/CRPT-109srpt322.pdf.

US Senate. (2006b). Preparing for a Catastrophe: The Hurricane Pam Exercise 109-403. In Committee on Homeland Security and Governmental Affairs (Ed.), *Informing Science Journal*. Washington DC: (4.6.17) https://www.gpo.gov/fdsys/pkg/CHRG-109shrg26749/html/CHRG-109shrg26749.htm

US Strategic Bombing Survey. (1947). Civil Defense Division Final Report. Washington DC: US Government printing Office.

USCG. (2005). Disaster response: 1200 27.9.2005: Department of Homeland Security.

USCG. (2005). Interview: Lewald, Robert: US Coastguard Katrina: U.S. Coast Guard Oral History Program, Katrina Archival & Historical Record Team (KART).

USCG. (2009). US Coast Guard: America's Maritime Guardian *USCG Publication 1*.

Vallance, S., & Carlton, S. (2015). First to respond, last to leave: communities' roles and resilience across the '4Rs'. *International Journal of Disaster Risk Reduction, 14, Part 1*, 27-36.

Van Alstyle, G. (2011). *2020 Media Futures: What will our media and entertainment be like by 2020*. Ontario: Strategic Innovation Lab, OCAD University.

Van De Ven, A. H., & Johnson, P. E. (2006). Knowledge for theory and practice. *The Academy of Management Review, 31*(4), 802-821.

van den Heuvel, C. (2012). High Fidelity Simulation Exercises for Training Strategic Crisis Management. *Business Continuity and Resiliency Journal, 1*(2), 4-14.

van Deth, J. (1998). Equivalence in comparative political research. In J. van Deth (Ed.), *Comparative Politics: The Problem of Equivalence* (pp. 1-19). London: Routledge.

Van Dyke, N., Wool, J., & LeDoux, L. (2011). Criminal justice reforms. In A. Liu, R. Anglin, R. Mizelle, & A. Plyer (Eds.), *Resilience and Opportunity* (pp. 64-81). Washington DC: Brookings Institution Press.

Van Heerden, I. (2007). *The Storm: What Went Wrong and Why during Hurricane Katrina*: Penguin.

van Stralen, D. (2015). Editorial: Ambiguity. *J of Contingencies and Crisis Management, 23*(2), 47-53.

Van Wart, M. (2004). A comprehensive model of organizational leadership: the leadership action cycle. *International J of Organization Theory & Behavior, 6*(4), 173-208.

Van Wart, M., & Kapucu, N. (2011). Crisis management competencies: the case of emergency managers in the USA. *Public Management Review, 13*(4), 489-511.

Varda, D., Forgette, R., Banks, D., & Contractor, N. (2009). Social network methodology in the study of disasters: issues and insights prompted by post-Katrina research. *Population Research Policy Review, 28*, 11-29.

Vaughan-Williams, N. (2008). Borderwork beyond Inside/Outside? Frontex, the Citizen–Detective and the War on Terror. *Space and Polity, 12*(1), 63-79.

Veil, R., Buehner, T., & Palenchar, M. (2011). A work-in-progress literature review: incorporating social media in risk and crisis communication. *J of Contingencies and Crisis Management, 19*(2), 110-122.

Verschuren, P. (2003). Case study as a research strategy: some ambiguities and opportunities. *Int J Scocial Research Methodology, 6*(2), 121-139.

Vollen, L., & Ying, C. (Eds.). (2008). *Voices from the Storm: The People of New Orleans on Hurricane Katrina and its Aftermath*. San Francisco: McSweeney.

Voorhees, W. (2008). New Yorkers Respond to the World trade Center Attack: An Anatomy of an Emergent Volunteer Organisation. *J of Contingencies and Crisis Management, 16*(1).

Vos, M., & Sullivan, H. T. (2014). Guest Editors' Introduction: Community Resilience in Crises: Technology and Social Media Enablers. *Human Technology, 10*(2).

Wachtendorf, T., & (2004). Improvising 9/11: Organizational Improvisation in the World Trade Center Disaster *Dissertation #35*. University of Delaware Disaster Research Center: Newark, DE.

Wack, P. (1985). Scenarios: shooting the rapids. *Harvard Business Review, 63*(6), 139-150.

Wainwright, J., & Mann, G. (2014). Climate Change and the Adaptation of the Political. *Annals of the Association of American Geographers, 105*(2), 313-321.

Walker, C., & Broderick, J. (2006). *The Civil Contingencies Act 2004: Risk, Resilience, and the Law in the United Kingdom.* Oxford: OUP.

Walker, J., & Cooper, M. (2011). Genealogies of resilience: from systems ecology to the political economy of crisis adaptation. *Security Dialogue, 42*(2), 143-160.

Wallace, S. (2009). *Oxford Dictionary of Education*. Oxford University Press.

Walters, J., & Kettle, D. (2006). The Katrina Breakdown. In R. Daniels, D. Kettl, & H. Kunreuther (Eds.), *On Risk and Disaster: Lessons from Hurricane Katrina* (pp. 255-261). Philadelphia: University of Pennsylvania Press.

Warner, K., Ehrhart, C., de Sherbinin, A., Adamo, S., & Chai-Onn, T. (2009). In Search of Shelter: mapping the effects of climate change on human migration and displacement. CARE: (4.6.17) http://www.care.org/sites/default/files/documents/CC-2009-CARE_In_Search_of_Shelter.pdf

Warren, B. (2007, 7.9.2007). Manganos not guilty in St. Rita's nursing home case. *The Times-Picayune*

Waugh, W. J., & Streib, G. (2006). Collaboration and Leadership for Effective Emergency Management. *Public Administration Review, Special Issue*, 131-140.

WEF. (2017). The Global Risks Report 2017 (12 ed.). Geneva: World Economic Forum.

Weiss, T. (2007). *Humanitarian Intervention*. Malden, USA: Polity.

Weiss, T. (2013). *Humanitarian Business*. Cambridge: Polity.

Welch, M. (2005). They Shoot Helicopters, Don't They? How journalists spread rumours during Katrina. *Reason, 37*(7), 16-18.

Wells, C. (1995). *Negotiating Tragedy: Law and Disasters*. London: Sweet & Maxwell.

Welsh, M. (2012). Resilience and responsibility: governing uncertainty in a complex world. *The Geographical Journal, 180*(1), 15-26.

Wesselink, A. J. (2007). Flood safety in the Netherlands: The Dutch response to Hurricane Katrina. *Technology in Society, 29*(2), 239-247.

Whittaker, J., McLennan, B., & Handmer, J. (2015). A review of informal volunteerism in emergencies and disasters: Definition, opportunities and challenges. *International Journal of Disaster Risk Reduction, 13*, 358-368.

Wilkinson, P. (Ed.) (2007). *Homeland Security in the UK: Future preparedness for terrorist attack since 9/11*. London: Routledge.

Wilsdon, J., & Doubleday, R. (Eds.). (2015). *Future Directions for Scientific Advice in Europe*. Cambridge, Centre for Science and Policy.

Wilson, J., & Gosiewska, S. (2014). Multi-agency gold incident command training for civil emergencies. *Disaster Prevention and Management, 23*(5), 632-648.

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *The Academy of Management Review, 18*(2), 293-321.

World Bank. (2010). Climate Risks and Adaptation in Asian Coastal Megacities: The International Bank for Reconstruction and Development.

World Economic Forum. (2016). Global Risks Report 2016. World Economic Forum, Davos: (4.6.17) http://www3.weforum.org/docs/GRR/WEF_GRR16.pdf.

World Medical Association. (2013). Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects (Adopted 1964). 64th WMA General Assembly, Fortaleza, Brazil, October 2013.

Wright, N. (2013). Small Island Developing States, disaster risk management, disaster risk reduction, climate change adaptation and tourism, *Background paper for the Global Assessment report on DRR 2013*. Geneva: UNISDR.

Yin, R. K. (2009). *Case Study Research: Design and Methods*: Sage.

Young, A. (2013). Coastal megacities, environmental hazards and global environmental change. In M. Pelling & S. Blackburn (Eds.), *Megacities and the Coast* (pp. 70-99). London: Routledge.

Zack, N. (2009). The ethics of disaster planning: preparation vs response. *Philosophy of Management, 8*(2), 55-66.

Zack, N. (2011). *Ethics for Disaster*: Rowman & Littlefield Publishers.

Zalasiewicz, J., Williams, M., Haywood, A., & Ellis, M. (2011). The Anthropocene: a new epoch of geological time? *Phil. Trans. R. Soc. A, 369*, 835-841.

Zismer, D. K., & Brueggemann, J. (2010). Examining the "dyad" as a management model in integrated health systems. *Physician Exec, 36*(1), 14-19.

Zook, M., Graham, M., Shelton, T., & Gorman, S. (2010). Volunteered geographic information and crowdsourcing disaster relief: a case study of the Haitian Earthquake. *World Medical & Health Policy, 2*(2), 7-33.

Zsambok, C. (1997). Naturalistic decision making: where are we now? In C. Zsambok & G. Klein (Eds.), *Naturalistic Decision Making* (pp. 3-16). Mahwah NJ: Erlbaum.

Zsambok, C., & Klein, G. (Eds.). (1997). *Naturalistic Decision Making*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

APPENDIX A: Case study timeline 23.8.2005 to 5.9.2005

(extract from the Center for Grassroots Oversight undated)

Tuesday 23 August:	A tropical storm called Katrina starts building up over the Bahamas in the Caribbean.
Wednesday 24 August	
Thursday 25 August	Tropical storm Katrina becomes a hurricane. At 11.45pm Hurricane Katrina strikes Florida. Nine people are killed and one million people lose power.
Friday 26 August	
Saturday 27 August	National Response Coordination Centre and other FEMA responses activated. Evacuation of Mississippi and Louisiana coasts ordered and contra-flows implemented. Mississippi declares a state-of-emergency. President Bush signs a Federal Emergency Declaration for Louisiana.
Sunday 28 August	Katrina becomes a Category 5, the strongest type of hurricane.
	Evacuation of New Orleans advised. Roads are jammed as families head for safety. Those who cannot leave shelter in the Super-dome stadium. Most nursing homes failed to evacuate but three residents died during evacuation.
	Alabama declares state-of-emergency and President Bush signs Federal Emergency Declaration for Alabama and Mississippi.
Monday 29 August: Landfall at 6.10am	The eye of Katrina lands at Plaquines Parish to east of New Orleans. Winds of up to 100mph and heavy rain strike the city. Levees are breached, and water floods into the city. Around 9,000 people shelter in the Superdome.
	President signs major disaster declarations for Louisiana, Mississippi and Alabama.
Tuesday 30 August	About 80% of the city is underwater, and the first survivors are rescued. People start to raid shops for food and water.
	Katrina declared an Incident of National Significance by Secretary Chertoff and Michael Brown (FEMA) deploys to Baton Rouge. US Northern Command authorised to begin relief.
Wednesday 31 August	Mayor Ray Nagin orders the full evacuation of the city. Estimated about 100,000 people are left. At least 20,000 people are now in

the Superdome, with little food and water. Conditions are getting worse. Looting of shops continues, and shootings are reported.

Gen Honore appointed to lead Joint Task Force Katrina and the President convenes a cabinet meeting on Katrina.

Hurricane Katrina expires over Quebec, Canada.

Thursday 1 September	New Orleans is reported in chaos. Crime, including shooting and theft, is widespread. Shots are allegedly fired at a helicopter trying to rescue people from the Superdome. The Government is accused of not acting fast enough to help the survivors. The evacuation of the Superdome slowly begins.
Friday 2 September	Relief is increased, as convoys of food, water and medicine arrive in the city, and thousands of troops and police are sent in to keep the peace. There is an explosion at a chemical store on the banks of the Mississippi. Tens of thousands of people are still stranded.
Saturday 3 September	
Sunday 4 September	Thousands of people are taken from the city as the US appeals for aid – blankets, food, water trucks and first aid kits. The government admits the number of dead could be in the thousands.
Monday 5 September	Most of New Orleans is empty. Rescuers search house to house for survivors. Admiral Thad Allen of US Coastguard is appointed to the Louisiana response, subsequently for all three affected States.

APPENDIX B.   Annotated bibliography of oral history and other sources

NB. Acknowledging the concerns of Buchanan & Denyer (2012: 216) that crisis research may use "data from sources normally considered unreliable and biased" I have collected those sources that I consulted that were not peer-reviewed, grey literature, or obviously of journalistic origin.

Ancelet, B., Gaudet, M., & Lindahl, C. (Eds.). (2013). *Second Line Rescue: Improvised Responses to Katrina and Rita*: University Press of Mississippi

> Professors Barry Ancelet and Marcia Gaudet, University of Louisiana at Lafayette, and Professor Carl Lindahl of the University of Houston collaborated in training a number of Katrina survivors in interview techniques and coordinated a series of interviews of fellow survivors who were evacuated to Houston (2013: 98). Many of the resulting stories are collected in their book where *second line* refers to the ad hoc group of dancers and mourners that follow the band in a New Orleans funeral procession. In other words, improvised or vernacular rescue. Interviewees include a prison guard.

Baum, D. (2010). *Nine Lives: Mystery, Magic, Death, and Life in New Orleans*. New York: Spiegel & Grau.

> Dan Baum, a journalist with the *New Yorker* covering Hurricane Katrina who arrived in New Orleans on 31 August 2005 and stayed in situ for six months. Published in 2010 the book uses the biographies of nine individual (characters) biographies interwoven to help the reader with the novel style narrative. The characters include Tim Bruneau, a white police detective officer and ex-military policeman; Dr Frank Minyard, the Orleans parish coroner; and Billy Grace, a millionaire businessman.   The book is based on regular interviews during that period with the above characters which included their backgrounds and experience of Katrina, cross-referenced (i.e. triangulated) by approximately 100 supporting interviews of friends, relatives and colleagues (Baum 2010: 325-331).

Bradshaw, L., & Slonsky, L. (2005, 7.9.2005). Trapped in New Orleans by the Flood -- and Martial Law. *Socialist Worker*.

> Two paramedics who were in New Orleans for a conference and became stranded. They gave an early online account of the community suffering and the apparent racial undertones of the crisis.

Brinkley, D. (2006). *The Great Deluge: Hurricane Katrina, New Orleans, and the Mississippi Gulf Coast*. New York: Harper Perennial.

> Professor David Brinkley, Tulane University, an academic historian and resident of New Orleans published this first history of the immediate aftermath of Hurricane Katrina in March 2006. Brinkley relied on a press pass to gain access to difficult areas and people and carried out many interviews personally, assisted by staff from both his publisher and the university. The manuscript pre-empted the criticism that was to follow from official sources and in the

words of the author "Because this book deals with mass negligence it had to be vetted carefully" (682) hence it was rigorously reviewed by the publisher's legal team.

Brown, M., (with Schwarz, T.) (2011). *Deadly Indifference: The Perfect (Political) Storm: Hurricane Katrina, the Bush White House, and Beyond:* Taylor Trade Publishing.

This is a personal account by Michael Brown, the former Under-Secretary of Homeland Security responsible for FEMA and later to become the 'fall guy', assisted by a journalist Schwarz, relying on diary entries and emails that seeks to spread the blame and offer reasons and excuses for the apparent failure of the federal response.

Center for Grassroots Oversight. Timeline: Hurricane Katrina Emergency Response. History Commons, The Global Center.

An online organisation that conducts "open content participatory journalism" with volunteer editors similar to the Wikipedia Foundation. Their extensive timeline is a mix of many anonymous online contributions and published materials (See Appendix A).

Cobb, J. (2013). *Flood of Lies: The St Rita's Nursing Home Tragedy*: Pelican.

James Cobb was a Katrina evacuee and the activist defence lawyer for the owners of the St Rita's Nursing Home who it was alleged had deserted their residents, 35 of whom drowned. They were acquitted in 2007.

Cooper, C., & Block, R. (2006). *Disaster: Hurricane Katrina and the Failure of Homeland Security*. New York: Henry Holt & Co.

Written by Christopher Cooper, the then political correspondent for the *Wall Street Journal* and former staff reporter for the New Orleans *Times-Picayune*, and Robert Block, a journalist covering the Department of Homeland Security for the *Wall Street Journal,* their book draws on a large number of interviews (p307), many with key informants such as Michael Brown, head of FEMA during Katrina, and the former head of FEMA James Lee Witt, together with newspaper reports, emails, transcripts and federal documents.

Cowen, A., & Cowen, S. (2010). Rediscovering Communities: Lessons from the Hurricane Katrina Crisis. *J of Management Inquiry, 19*(2), 117-125.

Dyson, M. (2006). *Come Hell or High Water: Hurricane Katrina and the Colour of Disaster*. New York: Basic Civitas Books.

Professor Dyson, University of Pennsylvania, used Katrina as a case study to highlight the social, economic, and political disadvantage of the poor black population of the US. The detail of Katrina is referenced and triangulates with other accounts but objectivity is lost in the passion.

Eggers, D. (2010). *Zeiton*. London: Penguin.

Dave Eggers, co-founder with Dr Lola Vollen of the Voice of Witness oral history series, focussed on the experiences of one New Orleans family,

Abdurrahman Zeiton, a Syrian immigrant businessman, and his wife Kathy, during Hurricane Katrina and then his unlawful detention as a suspected terrorist, published simply as *Zeiton*.

Fink, S. (2014). *Five Days at Memorial: Life and Death in a Storm-Ravaged Hospital*: Atlantic.

Dr Sheri Fink, a physician turned journalist, with experience of relief work in conflict zones, focussed on one New Orleans hospital, the private Memorial Medical Center Hospital, and the controversial events there during and immediately after Katrina struck. Memorial hospital housed a separate Lifecare facility for long-term very sick and often elderly patients on the seventh floor and achieved notoriety around the suspected use of euthanasia for these patients and the accusations against medical staff. Fink claims that she conducted more than 500 interviews between 2007 and 2009 (2013: xvii). However, her book was not published until 2014, after the litigation concluded.

Fisher, M. (2005). Essential again. *American Journalism Review, October-November 2005* (online archive).

Commentary on the performance of major national media outlets.

Forman, S. (2007). *Eye of the Storm: Inside City Hall during Katrina*. Blooming, I: Author House.

Sally Forman, a professional journalist and the Communication Director for the City of New Orleans during Katrina was a member of Mayor Nagin's cabinet and published this personal insider account of the management of the crisis.

Hartman, C., & Squires, G. (Eds.). (2006). *There is no such thing as a Natural Disaster: Race, Class, and Hurricane Katrina*. New York: Routledge.

A collection of essays, some based on academic research and others that are more descriptive with a socio-political aim.

Honore, R. (2009). *Survival: how a culture of preparedness can save you and your family from disasters*. New York: Atria Books.

A combined autobiography of Lt. General Russel Honore (ret.), the black Louisiana born commander of Task Force Katrina who became a media hero, and a survival manual based on his experiences of hurricanes Katrina and Rita.

Horne, J. (2006). *Breach of Faith: Hurricane Katrina and the Near Death of a Great American City*. New York: Random House.

Jed Horne was editor of the New Orleans daily *Times-Picayune* and inside the city during the disaster. He lists some 130 interviews (p417), of which over 30 he describes as 'extensive' and 'core' made whilst covering events for his paper and writing the book.

Hustmyre, C. (2006). NOPD versus Hurricane Katrina. *Tactical Response* July/August.

A former federal agent, Hustmyre provides anecdotal accounts of the post-

Katrina ordeal of NOPD officers and their individual acts of heroism for this trade magazine.

Inglese, D. (2007). *No Ordinary heroes: 8 Doctors, 30 Nurses, 7000 Prisoners and a Category 5 Hurricane*. New York: Citadel Press.

Dr Demaree Ingles MD, the medical director of the New Orleans prison with Diana Gallagher has written a detailed but at times jingoistic account of life in the prison during Katrina. He was a military medical officer with experience of humanitarian missions and seemed to treat the crisis as an adventure, at odds with the accounts of guards and prisoners.

Mann, N., & Pass, V. (2011). The cultural visualisation of Hurricane Katrina. *Invisible Culture, 16*(Spring), 1-9.

McQuaid, J., & Schleifstein, M. (2006). *Path of Destruction: The Devastation of New Orleans and the coming age of Superstorms*. New York: Little, Brown and Co.

The authors are two Pulitzer Prize journalists who campaigned about the hurricane risks to New Orleans prior to Katrina. The first half of their book gives detailed background, including notes of their sources, of the history of severe storms in general and the impacts on settlements in Louisiana. The second part of this book includes narrative of events immediately after the impact but beyond naming the actors and locations no other details of sources are given.

Nagin, C. R. (2012). *Katrina's Secrets: Storms after the Storm*. North Charleston SC: CreatSpace.

Ray Nagin, ex-mayor of New Orleans and now serving ten years for corruption, was elected in 2002 and re-elected in 2006 despite his performance during Hurricane Katrina. In 2011 he self-published this as a personal account from memory.

Rathke, W., & Laboistrie, B. (2006). The role of local organising: house-to-house with boots on the ground. In C. Hartman & G. Squires (Eds.), *There is no such thing as a Natural Disaster*. New York: Routledge.

An account of the beginning of grassroots recovery in New Orleans by the Association of Community Organisations for Reform Now (ACORN) and similar groups that were hit by the storm and the resistance they encountered from the authorities.

Sloan, S. (2008). Oral History and Hurricane Katrina: Reflections on Shouts and Silences. *The Oral History Review, 35*(2), 176-186.

Spizale, D., Ancelet, B., Perrin, M., & Suire, S. (2013). Images from Hurricanes Katrina and Rita. In B. Ancelet, M. Gaudet, & C. Lindahl (Eds.), *Second Line Rescue* (pp. 73-87). Jackson: University Press of Mississipi.

Photographs taken by volunteer rescuers of their response operation and the conditions they found.

Stein, A., & Preuss, G. (2006). Oral history, folklore, and Katrina. In C. Hartman & G. Squires (Eds.). *There is no such thing as a Natural Disaster* (pp. 37-58). New York: Routledge.

Although the essay begins as a discussion of the methodology of oral history it leads on to illustrate this by reference to examples of oral history drawn from New Orleans first responders, evacuees, and prisoners.

The Historic New Orleans Collection. (Undated). Through Hell and High: Water Katrina First Responders Oral History Project.   Retrieved from http://www.hnoc.org/programs/oral_history.html

Thevenot, B. (2005). Apocalypse in New Orleans. *American Journalism Review, October - November 2005*(Online archive).

An account of what it was to be a journalist in New Orleans after Katrina made landfall, and how he was a victim of the event.

USCG (2005). Katrina Archival & Historical Record Team (KART): U.S. Coast Guard Oral History Program

Interview: Gilreath, Shannon: USCG Commanding Officer, Marine Safety Unit Baton Rouge,

Interview: Jones, Bruce: USCG Commanding Officer, Air Station New Orleans.

Inteview: Lewald, Robert: US Coastguard Katrina.

Vollen, L., & Ying, C. (Eds.). (2008). *Voices from the Storm: The People of New Orleans on Hurricane Katrina and its Aftermath*. San Francisco: McSweeney.

Oral history accounts of thirteen residents of New Orleans, including an unlawfully detained Orleans Parish prisoner, two parish priests, a grandmother with the care of five children and a famous jazz musician, about their experiences in the period 27.8.2005 to 4.9.2005

APPENDIX C: Map of the Gulf Coast (Brinkley 2007: xxv)

APPENDIX D: Map of New Orleans flooding (Brinkley 2007: xxvi)