

UNIVERSITY OF HULL

Rethinking the Spaces and Institutions of Flood Governance

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ABSTRACT

In 2007 the city of Hull in Yorkshire, England, experienced extremely high levels of rainfall. The city is very low lying, built predominantly on drained land which relies on a pumped drainage system; as a result, the city flooded. There were a number of other incidents of flooding across England in the summer of 2007, but Hull was unusual as such a large proportion of the city flooded – 91 of the 99 schools in the city were flooded – the city was faced with a crisis. The flooding 2007 was widespread and also affected some politically sensitive areas, consequently, after the flooding, there was a government inquiry which looked specifically at the lessons that could be learnt from the event and Hull's local narrative was picked up by the panel in this inquiry as it was an exemplar of pluvial flooding, an issue that came to light nationally in 2007. The flooding in Hull in 2007 became part of a nationally important event which drove change in policy and resulted in the Flood and Water Management Act 2010.

This thesis uses evidence from 31 in-depth interviews, participant observation and policy analysis to explore the theory that rapid policy change can occur in the windows of opportunity which open up as a result of a shock to the system. For example, changes made to flood governance and policy when a nationally important flood crisis occurs. Specifically, this thesis uses the 2007 flood event to re-examine the theory of policy windows in driving changes in flood governance in England and Wales. Furthermore, where previous studies have focussed on national level policy change and policy windows, this study explores the applicability of the theory to the local level, looking at the case study of the city of Hull between 1945 and 2010.

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DECLARATION

I declare that this thesis is my own work and has not been submitted in any previous application for a degree. Contributions have been acknowledged.

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1 INTRODUCTION

In the summer of 2007, after a long wet spring, a slow moving area of low pressure and associated frontal system bombarded the UK with hour after hour of heavy rain. This produced widespread flooding in many areas of the UK, with over 55,000 properties flooded nationwide (Pitt, 2008; Coulthard *et al.*, 2007). One of the worst affected areas was the city of Kingston-upon-Hull. This thesis examines the impact of the 2007 flooding at a local level, taking the city of Hull as a case study, and focussing on changes which occurred in the three years after the 2007 floods.

113.2 millimetres of rain fell on the city of Hull on June 24th and 25th; an event that would only be expected to occur once every 200 years (Met Office, 2009). The average rainfall in Hull for the whole month of June is just 58 millimetres – roughly half of what fell in just two days in 2007 (*ibid.*). Hull is built on low, flat land and relies on pumps to convey water through its drainage system at all times. In an effort to remove water from the drainage system and the city's streets in June 2007, Hull City Council alone estimates to have pumped 65 million litres of water out of the city, whilst the Environment Agency was also using five tonne pumps that can remove water at a rate of 1,000 litres per second (Hull City Council, 2009b). They faced a considerable challenge as “at the height of the deluge, the equivalent of 20 Olympic-sized swimming pools of rain fell on Hull per second” (Hull City Council, 2009b). Unfortunately the drainage system did not have sufficient capacity to hold the water and widespread surface water flooding occurred across the city¹ (Crichton, 2007).

Estimates vary of the exact number of properties flooded. BBC News reported 17,000 properties affected, which will have included houses, schools, businesses and public buildings, while Hull City Council's official website only gives figures for houses, somewhere in the region of 9,000 (Hull City Council, 2009b; Pitt, 2008; Coulthard *et al.*, 2007). Hull City Council's estimates had to be revised from 8,600 to 9,000 as cases

¹ Surface water flooding is defined by Hull City Council as:

“Surface water flooding occurs when intense rainfall, often of short duration, is unable to permeate into the ground or enter the drainage systems quickly enough to prevent a build up of water to an extent that it ponds on or flows across the land surface.” (Hull City Council, 2009a: pg 4).

This definition is shared by the Environment Agency who describe it as follows:

“Surface water flooding occurs when heavy rainfall overwhelms the drainage capacity of the local area.” (Environment Agency, 2009).

of secondary flooding² continued to come to light as long as two years after the initial deluge. According to the 2001 census, there are 111,842 properties in Hull, which means that somewhere between 10 and 20% of properties in the city were flooded in this one event (Office for National Statistics, 2001a).

Statistics on the number of people in Hull affected by the flooding are also unclear. Again estimates vary, from 20,000 (Hull City Council, 2009a) to 35,000 (BBC News, 2007a). The definition of the term “affected” may explain the variation as the lower estimates only reflect people whose homes were flooded and do not include people whose schools or places of work were flooded. Since the population of Hull at the last census was 243,589 and has reportedly dropped in recent years, at least 10 to 15% of the population were “affected” in some way by the flooding (Office for National Statistics, 2001a). 6,300 people were forced to live in temporary accommodation; over 1,400 of those were in caravans (Coulthard et al., 2007). Furthermore, 91 of the 99 schools in Hull were forced to close, causing considerable social and economic disruption in the area (ibid.). Hull City Council’s estimates of areas that were flooded are presented in Figure 1-1. It is important to note that the Local Authority boundary is drawn very tightly around the city of Hull and the surrounding villages such as Cottingham which are shown on the map were also flooded, but this data is not shown on Hull City Council’s map. This is a subject that will be examined in more details in Chapter 5.

² Secondary flooding occurs when water seeps into the foundations of a house, without water ever rising above the floor level. The water rises up through walls and joists and can result in as much damage to the building as traditional flooding (Whittle et al., 2010). This type of flooding may initially be overlooked as it does not present itself as obviously at first, cases tend to come to light in the following months as walls and floors become mouldy. Secondary flooding is still a contested issue as it is not recognised as a form of flooding by insurers.

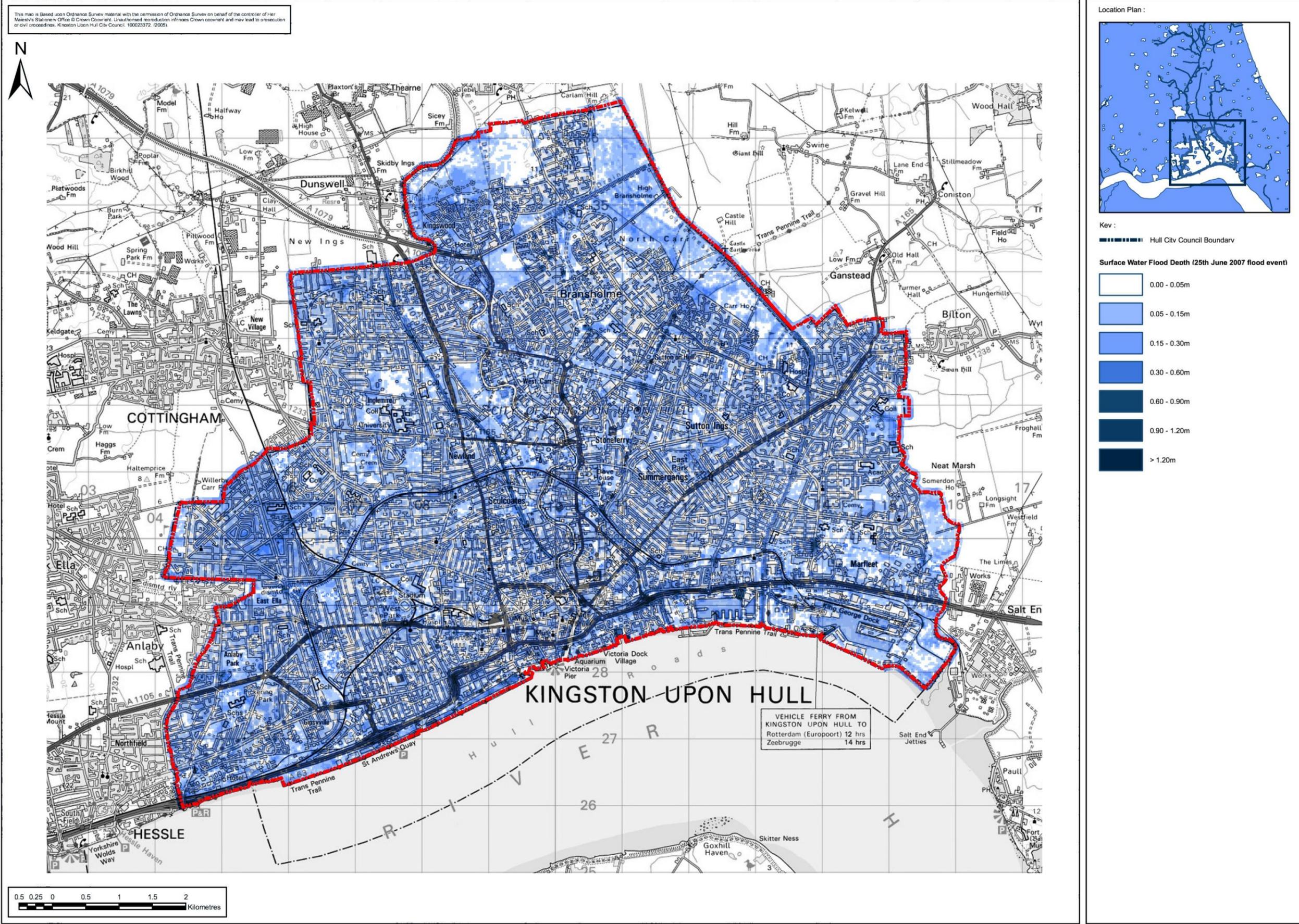


Figure 1-1 Map showing flooding in Hull in June 2007 (Hull City Council, 2007)

The Fire Brigades Union and the RAF described the national rescue effort undertaken in response to the 2007 floods as the “biggest in peacetime Britain” (Guardian, 2007). The meteorological conditions were extremely unusual, and the Prime Minister, Gordon Brown stated that it was an “emergency that no one could have predicted” (BBC News, 2007a). This provided little defence for the government who found themselves under enormous public pressure in the aftermath of the flooding. A great deal of criticism was levelled at the government as the Met Office had issued a severe rain weather warning two days before the floods, but this had not translated into action or a warning issued to the general public. Conservative MP, John Redwood, was overtly critical of the government, saying: “The Government's failure to prevent these floods is an outrage. Their response was appallingly lackadaisical. Ministers are nowhere to be seen. There were no sandbags in place, no pumps and no ditches had been cleared. Why wasn't the fire brigade or even the Army mobilised?” (Telegraph, 2007c, pg. 1). In the face of such criticism the Environment Secretary, Hilary Benn MP, insisted, “we just have to recognise the intensity of the volume of water that's come down and that has resulted in flooding that, even with the best defences in the world, would in some cases have been overtopped” (Telegraph, 2007c, pg. 1).

The amount of funding allocated to flood defences and flood risk management was also called into question. Ed Gallagher, chief executive of the Environment Agency from 1995 to 2000, claimed that the government had not heeded his warnings to increase funding for flood risk management; “during my time at the Environment Agency, I warned ministers that flooding was getting more and more extreme. We said that more investment was needed, not just on defences but on research and development.” (Telegraph, 2007a). Gordon Brown made efforts to placate the critics by announcing an independent review and increased funding, saying “we are going to be increasing the money that goes to flood and coastal defences so that we can be as well protected as possible in the future” (BBC News, 2007a).

In the immediate aftermath of the 2007 flooding, the Government made £2.15 million available to Hull City Council to aid recovery (Reuters, 2007). It was the largest grant allocation of any local authority and part of £8 million that was distributed to councils nationwide (ibid)³. Further emergency funds were made available through other routes such as Regional Development Agencies with Yorkshire Forward (the RDA for Yorkshire and the Humber) making £5 million available to help businesses in the area recover from the flooding (BBC News, 2007b).

³ By contrast, Sheffield, which was also flooded in 2007 only received £600,000 (Telegraph 2007d)

The Government's house building policy was subject to intense scrutiny as it included plans to develop further areas at risk of flooding (Telegraph, 2007b). In 2003, planning permission was granted for over 600 new properties nationwide against the recommendations of the Environment Agency (Crichton 2005). The difficulty at the time was that local planning authorities were only encouraged to seek advice from the Environment Agency on the suitability of a site on the categories of flood risk who only have a responsibility for fluvial flooding (DCLG, 2001). In 2006, with the introduction of Planning Policy Statement 25, Environment Agency consultation became a "requirement", yet still in 2007, 20% of projects that the Environment Agency objected to were granted planning permission regardless of the objection (RMS, 2007). In Hull, almost the whole city is considered to be at risk of flooding by the Environment Agency (Environment Agency, 2006).

The public wanted to know who was to *blame* for their personal losses. The 2007 floods became the focus of extensive investigations. In Hull, an "Independent Review Body" made up of academics, local policy makers and third sector workers undertook an investigation at a local level focussed on assessing the causes of the flooding and setting out recommendations for the future based on those findings. At the national level, an independent review was carried out under the direction of Sir Michael Pitt, looking at the flooding which had occurred across the whole country in the summer of 2007, resulting in a published report entitled "Learning the Lessons from 2007". In an increasingly litigious modern society it was very difficult for people, nationally and in particular in Hull, to accept that there would be no quick answers as no one body was responsible for the holistic management of the area's drainage system and flood risk. Both the local and national reports highlighted the unforeseen risks posed by pluvial or surface water flooding which became apparent in 2007. Hull had only previously been considered at risk of fluvial or tidal flooding, the 2007 flood was quickly conceptualised and rationalised as a new type of flood risk.

In light of this conceptualisation of 2007 as a crisis event in which a new unforeseen risk was exposed, this thesis explores whether or not the 2007 flood created an opportunity for change and acted as the driver of policy evolution and new governance regimes both locally and nationally. In order to understand how the crisis came to pass in Hull in 2007, this thesis explores the underlying tensions and contradictions which have played out in the organisational framework of flood governance over the last fifty years. Flooding used to be perceived as a natural hazard against which defences were erected (White, 1945; Wisner *et al.*, 2004), but in recent years with the publication of the Intergovernmental

Panel on Climate Change Fourth Assessment Report (IPCC, 2007) and many other reports, it has undergone something of a transition, assuming a new identity as a symptom of climate change. It is now more readily accepted and framed as a human-induced problem, or at least a socially mediated problem. Alterations to the physical landscape are not purely as a result of natural change, but also human agency. Physical phenomena such as flooding cannot, therefore, be examined in isolation from their social context. Using an historical comparison of a previous shift of the flood governance regime from land drainage tied to food production to flood defence under the welfare state (Penning-Rowsell *et al.*, 2006), the empirical chapters of this thesis assesses the social, economic and environmental context in which flood risk management has evolved. Flood governance arrangements before the 2007 flood in Hull and the ensuing changes will be examined to ascertain the role of the 2007 flood event specifically in driving changes in flood risk policy and practice nationally and locally and assess the extent to which these changes have been effective in reducing vulnerability to flood risk. Rather than existing as an external entity, the state is inextricably linked to civil society through the democratic processes of election and public scrutiny. This case study of the 2007 floods in Hull provides a basis on which to consider to what extent a pluralistic democratic system exerts influence over the flood governance system, demanding changes after a crisis event, through public pressure.

An interesting paradox arises in flood risk management because floods are a relatively “common” hazard and are the most frequently occurring environmental disaster in Europe, people are aware of their existence and their distribution is relatively predictable, nevertheless flooding remains a deadly hazard in developed countries such as the UK losses cost millions every year and flooding fills the headlines of the national newspapers on a regular basis (Smith and Petley, 2009; European Environment Agency, 2005). It would be easy to assume that a common hazard would be one that was well understood and planned for, but in fact flooding is full of uncertainties about magnitude and timing, which poses a real impediment to policy and decision-making (Smith, 1997).

Flooding is of particular political interest in the UK today as approximately 10% of the population of England and Wales and £200bn worth of assets are at risk of flooding (Halcrow and John Chatterton Associates, 2003). The risks associated with flooding in England and Wales have been framed in different ways at various points in history. From the 17th century the focus was on land drainage and creation and so flooding was subsumed within agricultural policy, then as flooding became more of a problem in urban areas the task of flood protection became part of an urban defence strategy, and

finally the recent adoption of a flood risk management strategy has been coordinated by a complex institutional arrangement (Penning-Rowsell *et al.*, 1986; Scrase and Sheate 2005). The system of flood governance in England and Wales has grown in a reactive fashion (Penning-Rowsell *et al.*, 2006), each new paradigm based on experiential knowledge, empirical evidence and the social, cultural and political demands of the time.

This thesis uses interviews, participant observation and policy analysis to examine changes in flood governance using the case study of the 2007 floods in Hull to explore potential strategies for overcoming the issues faced by the now privatised and highly fragmented governance system. With the risks so abundantly clear, in light of regular flood incidents across the UK, it is politically impossible to ignore the demand for a more holistic review of flood governance at a national and local level, particularly in Hull because as Richard Benyon (Parliamentary Under Secretary of State for Environment, Food and Rural Affairs) pointed out in parliament, “it remains the case that Kingston upon Hull and the surrounding areas have the greatest concentration of people and property at risk from flooding outside London” (Hansard, 2010; column 925).

2 LITERATURE REVIEW

2.1 INTRODUCTION

This thesis examines pluvial flooding in three ways; as an event that opens up windows of opportunity for policy change, as a risk the public have an interest in engaging with and as a new unknown risk. This chapter will give an overview of the key research influencing the argument developed in this study. This thesis approaches the subject of flooding primarily from a geographical perspective, combining environmental governance theory with concepts from social nature studies, disaster risk reduction and vulnerability studies. Temporal change is highly important in this thesis and therefore historical principles are used to add a further dimension to the analysis by providing a lens through which underlying social, cultural and physical conditions can be examined in the context of the historical trajectory that they followed in order to reach their current position. The concept of flood governance is used in order to explore the way in which flood risk has evolved since the privatisation of the water industry in 1989 to include a wide range of actors beyond the state.

2.1.1 CURRENT ENVIRONMENTAL DEBATES: GLOBAL CLIMATE CHANGE

The historical relationship that developed between the city of Hull and its environment stemmed from the immediate and local experiences of the population, but today, the threat pertains to a global risk of climate change.

Despite much controversy in the media and government, the consensus in the academic community is that the climate is changing as a result of anthropogenic influencing: approximately 95% of published climatologists say this is “extremely likely” (Bernstein *et al.*, 2007). International climate monitoring centres such as the UK Met Office/UEA Climatic Research Unit (CRU), NASA’s Goddard Institute for Space Studies, and the US National Climatic Data Centre (NCDC) have recorded increasing global average temperatures, as shown in Figure 2-1.

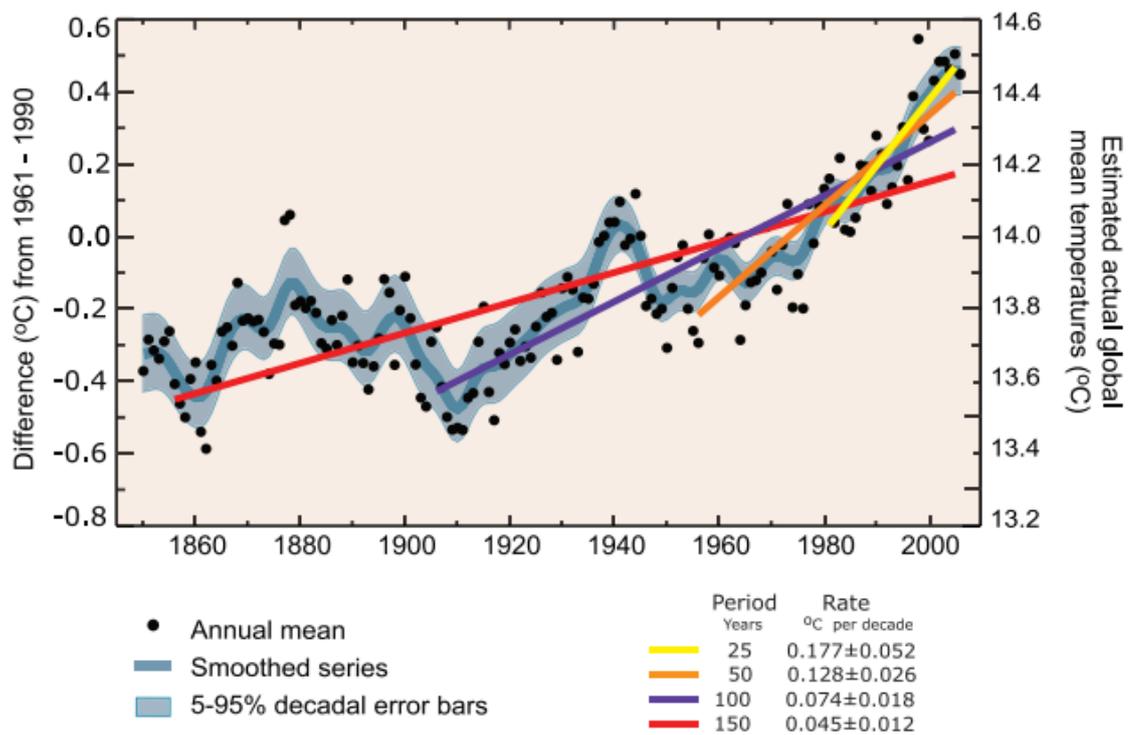
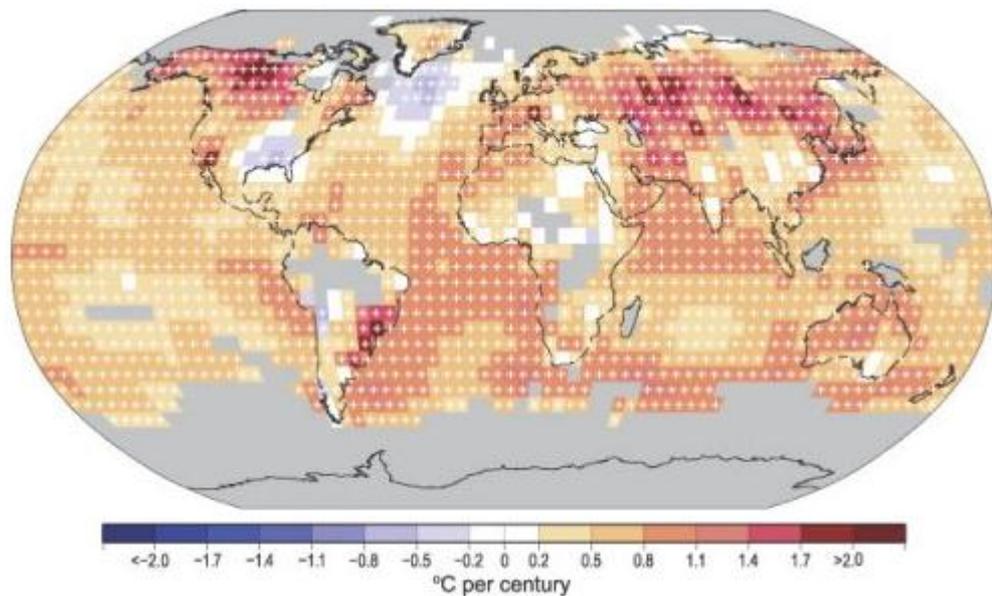


Figure 2-1 Graph of global mean temperature
(Trenberth *et al.*, 2007: pg 253)

Furthermore and linked to increasing global temperatures, the IPCC Fourth Assessment has observed rising global sea levels⁴ (Bindoff *et al.*, 2007), losses from glaciers and ice caps (Lemke *et al.*, 2007), reduced winter snow cover in the Northern Hemisphere (Lemke *et al.*, 2007), shifting rainfall patterns, increased humidity and increasing incidences of extreme temperature and precipitation events (Trenberth *et al.*, 2007). This has huge implications for many aspects of life and all manner of physical processes and social regimes; accelerated extinctions, shifting habitats and associated species have all been observed (Trenberth *et al.*, 2007). The importance of this to this thesis, however, is the way in which these changes have played out at the local level for there is huge spatial variation hidden within global data, as shown on Figure 2-2 (Trenberth *et al.*, 2007).

⁴ The IPCC report predict a sea level rise by 2100 of 0.18 – 0.38m increase in the in the lowest emissions scenario and 0.26 – 0.59m in the highest emissions scenario (Bindoff *et al.*, 2007).



*Figure 2-2 Annual global temperature trends 1901 to 2005 (°C per century)
(Trenberth et al., 2007: pg 250)*

2.1.2 CLIMATE CHANGE: UK

Records for the UK already indicate that annual temperatures are rising, with a 1°C rise since the 1970s and government funded, peer-reviewed climate predictions for the UK (UKCP09) indicate that this trend is likely to continue with warming particularly concentrated in the summer (June, July, August) in which temperatures are predicted to rise between 3 and 4°C by the 2080s, under a medium emissions scenario (UKCIP, 2009). Sea levels have been rising 1mm p.a. on average since 1900; this has been accelerating in recent decades to 3mm p.a. and this trend is expected to continue (UKCIP, 2009). Rainfall is expected on average to increase in winter and decrease in summer (Met Office, 2012). Finally, an increasing incidence of heavy downpours has been observed and is expected to continue to be particularly prevalent in winter (UKCIP, 2009).

Many of the changes that are predicted to affect the UK will have a significant impact on flood risk in the future; increasing precipitation could increase overall fluvial and pluvial flood risks, increasing extreme precipitation events could increase the frequency and intensity of flash flooding and rising sea levels could increase coastal and estuarine flooding risk. The problem is further compounded by the fact that current UK policy and legislation does not currently have the tools to address this growing problem (HMSO, 2009). In 2004 the UK Government's then Chief Scientific Advisor, Sir David King warned:

“There are two key messages. Firstly, continuing with existing policies is not an option – in virtually every scenario considered, the risks grow to unacceptable levels. Secondly, the risks need to be tackled across a broad front. Reductions in global emissions would reduce the risks substantially. However, this is unlikely to be sufficient in itself. Hard choices need to be taken – we must either invest more in sustainable approaches to flood and coastal management or learn to live with increased flooding.” (King, 2004: 2)

This is particularly important to Hull because it faces such a range of risks as a result of its geographical location; a city built on drained land on the banks of a wide estuary, with another river running through it. It relies on a pumped drainage system and a sea wall to keep it dry at the best of times. For example, Hull faces increasing estuarine flooding risks from the River Humber if sea levels continue rising, but it could also face increased risks from pluvial flooding if sea levels rise and the opportunities to pump water from the city into the River Humber are reduced.

2.1.2.1 UK CLIMATE CHANGE: EXTREME RAINFALL EVENTS

UK flood governance, therefore, has come under increasing scrutiny in line with increasing concerns about climate change. Of particular pertinence to pluvial flood risk in Hull is the UK Climate Prediction (UKCP09) pertaining to rainfall in Britain becoming more extreme. The forecast indicates that average daily rainfall rates will become much more variable and there could be an increase in intense precipitation over relatively short periods of time, which have the potential to become flash flooding incidents (Murphy *et al.*, 2009). This is in line with scenario-based climate modelling studies (Jones *et al.*, 2004; Buonomo *et al.*, 2007; Ekstrom *et al.*, 2005; Fowler and Ekstrom, 2009) which also predict an increase in “extreme rainfall events” in the UK, specifically “extreme precipitation” is expected to increase 80% over the period from 2010 to 2080, compared with the period from 1961 to 1990 (Fowler *et al.*, 2010: pg 262).

Despite the predictions for extreme rainfall nationally, it does not necessarily follow that all regions will be equally affected and it is important to attempt to examine potential changes at catchment level where the variations in conditions may vary considerably. One study looked at 40 towns and cities across the UK, including Hull, and also concluded that high intensity “winter rainfall events are projected to become more frequent” (Sanderson, 2010: pg 2). However, extreme rainfall events in the summer are subject to more variation; taking the case of Hull, which is typical of the data seen across the UK, it is unclear whether concentrated summer precipitation events will increase or

decrease as the margin of error is too large to make usable predictions at this scale (see Figure 2-3).

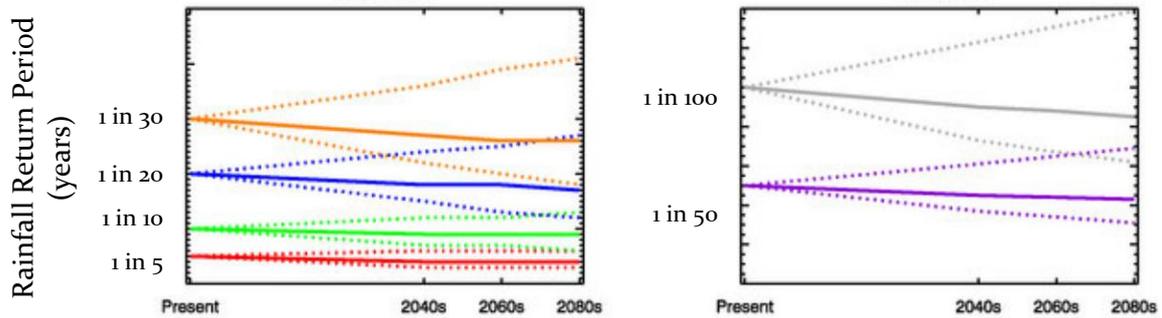


Figure 2-3: Summer Extreme Rainfall Event Predictions for Hull
(adapted from Sanderson, 2010: pg 21)

These estimates and projections were “generated using the latest science available for extreme value analysis, but some of this science is still being developed and evaluated” and the results are presented on the basis that they should be used “with caution” (Sanderson, 2010: pg 3). Nevertheless, the key message that environmental conditions are changing and therefore flood policy needs to find a way to evolve with it in order to remain relevant

2.1.3 HISTORICAL LANDSCAPES OF WATER IN HULL

In the absence of modern technology and the ever growing demand for housing, flood risk was easier to avoid than endure and “floodplains and wetlands across Britain initially were avoided for settlement and commerce – except where they provided defence from attack, potential for water power or a source of livelihood for which appropriate precautions could be made”; Kingston-upon-Hull was one such exception (Werritty, 2006: pg 16). The city grew from a simple port in the Middle Ages to become one of the most important fishing hubs in the UK and whilst its economic, social and cultural landscapes changed through different eras, the common thread through the city’s past is water and more specifically, the Rivers Hull and Humber (Gillett and MacMahon, 1989). Walls were built around Hull even in its earliest stages of development; “grants of murage” are reported as having been granted by the Crown in 1341, 1348 and 1355 to “complete a wall, begun by them for the safety of the town and the parts adjacent, on the water of Humber”, which may have acted not only as defensive barriers to attack, but perhaps also as early flood management structures (Foreman, 1989). Water therefore has multiple facets in the context of Hull, a city built on the confluence of two rivers and

whose history is inextricably linked to the water all around it. Water is conceptualised as a life sustaining natural resource, as a means of transportation and trade, a vehicle of power and profit, and yet at the same time also as a barrier to development and a potential hazard.

The city of Hull began to profit from its close relationship with water in the 18th century with the rise of the whaling industry which funded the first dock in the city in 1778 and by 1800, 40% of whalers operating in Great Britain were based in Hull (Allison, 1969). In line with this, the population grew from 7,512 in 1700 at the beginning of the century to 27,609 by 1801 (A Vision of Britain On-line, n.d.) and consequently residential expansion outside of the “old town” began on land which had previously been drained for agricultural use (Gillett and MacMahon, 1989).

In the 19th century as whaling declined, Hull retained its economic success as the fishing industry grew (Gillett and MacMahon, 1989). Hull’s port and docks continued to prosper with the building of railways to Leeds and Barnsley in 1840 and 1885 respectively, which transformed Hull into the gateway to continental Europe (ibid). Hull thrived on its proximity to water and at the turn of the twentieth century the city was in its prime with a population of 239,000 (at the 1901 census, Census data presented by A Vision of Britain On-line) with enough money to build spectacular civic buildings such as the Guildhall between 1904 and 1914 (Gillett and MacMahon, 1989). Maritime commerce brought Hull not just wealth and employment, but an identity as the city built on the opportunities presented by its richest natural asset, the water running through and beside it. The experiences of flooding, proximity of settlement to the rivers along with the process of human activity through docks, drains, dykes and defences have been so strongly intertwined in the Humber area that it can be described as more of a waterscape than a landscape (Bankoff, forthcoming, 19.1.2013).

Sadly, the two World Wars took their toll heavily on Hull and the city suffered huge problems of unemployment in the depression of the 1930s and then became the most heavily bombed city outside of London in World War Two (Gillett and MacMahon, 1989). The “avoidance of floodplains for settlement broke down during the 1930s and 1940s as unplanned urban growth spilled onto floodplains and low-lying coastal areas” such as the land around Hull (Werritty, 2006: *pg* 17). Finally, the decline of the fishing industry through over-catching and the effects of the “cod wars” with Iceland in the 1970s were strongly felt and culminated in the closing of the last fish market in Hull in 2011 after a century of trading (BBC, 2011). Throughout the economic cycles, there have also been regular instances of flooding, both localised and city-wide (which will be

detailed in Chapter 4). In 1980, a flood barrier was erected across the River Hull to protect the city from tidal flooding (Environment Agency, 2011). This dramatically reduced the incidence of flooding in the city (ibid.). The lack of water-related industry and employment, coupled with the reduced risk of flooding meant that the connection with water that Hull had once had, had been severed. In recent years Hull has developed a different relationship with water; in 2007 the city was awash with floodwaters and water was at the peak of public consciousness, this time with negative connotations and emotions.

Such an evolving identity of water requires complex and progressive system of governance which can be both proactive where possible and reactive where needed in order to deal with the multiplicity of problems arising from water management. This thesis explores the extent to which flood governance in Hull has changed in line with various events that have occurred in the local area as well as nationally⁵.

2.2 UNDERSTANDING A FLOODING DISASTER

The key to understanding flood events and their influence over policy is to understand their place within the broader context of an area. For example, flood risk can go largely unnoticed by a population, but then a flood event can expose this risk and also uncover variations in the impact of the physical events according to various social and cultural conditions. The variations in degrees of vulnerability across a population as well as their resilience to an event and finally their ability to adapt to and mitigate against flood risk will be explored in this section.

2.2.1 MITIGATION

Flood management followed a historical path which had a strong emphasis on structural solutions and “research on disasters was dominated by physical scientists and engineers” right up until the middle of the twentieth century (Mileti, 1999). This approach was known as *mitigation* and is characterised by attempts to manage a natural hazard

⁵ It is important at this stage to note that the “national” scale used in this thesis is somewhat complex; the national government of the United Kingdom of Great Britain and Northern Ireland which sits in Westminster debates policy for the whole of the UK, but as a result of devolution, there are separate decision and policy-making systems have been delegated to Scotland and Northern Ireland and therefore only England and Wales remain under direct jurisdiction of the national government in Westminster. For differences between England and Wales and Scotland see Crichton (2003) and an outline of flood risk management responsibilities and strategies in Ireland can be found in Walker, Sargent and Waterworth (2000). In an evaluation of flood forecasting, warning and response systems across Europe, Scotland and Northern Ireland were found to be less well developed than England and Wales (Parker and Fordham, 1996).

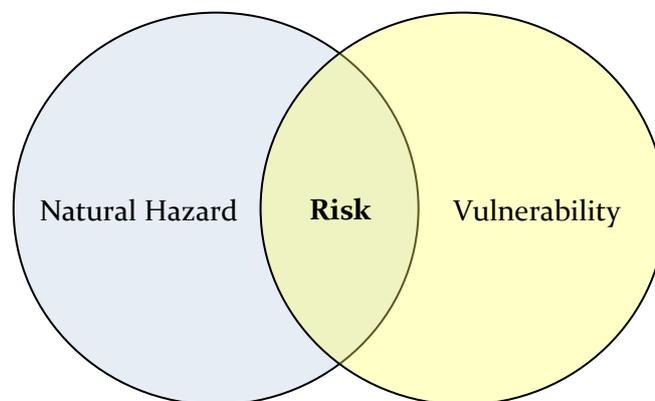
directly (Phillips, 2008). As will be discussed in detail in Chapter 4, flood mitigation was the primary policy of flood governors in England and Wales in the first half of the 20th century; it was largely a rural affair as the main concern was the creation and protection of agricultural lands for food security (Werritty, 2006; Tunstall *et al.*, 2004). Flood policy focussed on physical parameters, government efforts were focussed on post-disaster relief and the associated governance processes were predominantly technocratic (Penning-Rowsell *et al.*, 1986). Mitigation strategies include: structural engineering work, hazard-resistant construction techniques, and controls on development and management of land and infrastructure (Mitchell and Ericksen, 1992).

2.2.2 VULNERABILITY

In 1945, an alternative discourse began to appear which rejected the notion of “natural disasters” and reliance on structural solutions from engineering and instead declared that “floods are ‘acts of God’, but flood losses are largely acts of man” (White, 1945: *pg* 2). This statement was based on a study of flood risk in the USA by Gilbert F. White which introduced the idea that flooding itself was not the problem, but the intersection of man with flood water that created difficulties and therefore championed adaptation to floods (White, 1945). Building on the idea that disasters only occur when there is an affected population, Burton and Kates (1964: *pg* 413) defined natural disaster as:

“those elements of the physical environment harmful to Man and caused by forces extraneous to him.”

However, these definitions do not take account of the role of humans in affecting their own vulnerability to hazards; they place responsibility for the occurrence and severity of a flood event still in the realms of the unknown.



*Figure 2-4 The composition of risk
(adapted from Crichton, 1999)*

These definitions paved the way for social understandings of risk, an approach focussed on reducing social vulnerability and increasing social resilience which has developed in recent years. As Wisner *et al.* (2004: pg 235) pertinently assert:

“Vulnerability issues need to be addressed not through the prevention of floods, but through changes in the processes that create the unsafe conditions.”

This strategy builds upon relief and emergency measures, giving more thought to mitigation and preparedness, which shape social vulnerability. Historically, vulnerability has itself been thought of as a physical condition, but it is also important to recognise the social aspects as well, which can be equally important in influencing risk (Hilhorst and Bankoff, 2004). Vulnerability is described by Wisner *et al.* (2004: pg 11) as

“the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process)”.

Social vulnerabilities are rooted in economic, social, political and environmental condition and therefore vulnerability can vary between and within communities (Wisner *et al.*, 2004; Hilhorst and Bankoff, 2004; Few *et al.*, 2004). The intrusion of flood waters (i.e. the natural hazard) is often fairly ubiquitous - within a given area, exposure does not vary according to age, gender or wealth, but the effects of that exposure can vary enormously (Smith, 2000; Barroca *et al.*, 2006). Using the case study of the 2007 floods in Hull, Walker *et al.* (2011) showed how some people are much more able to recover from a flood than others which demonstrated how two people who have the same root causes of vulnerability can experience a disaster very differently as their individual conditions can magnify or shrink their vulnerability. This was articulated by Wisner *et al.* (2004) as the application or the release of pressure on individual vulnerability and is shown visually in Figure 2-5.

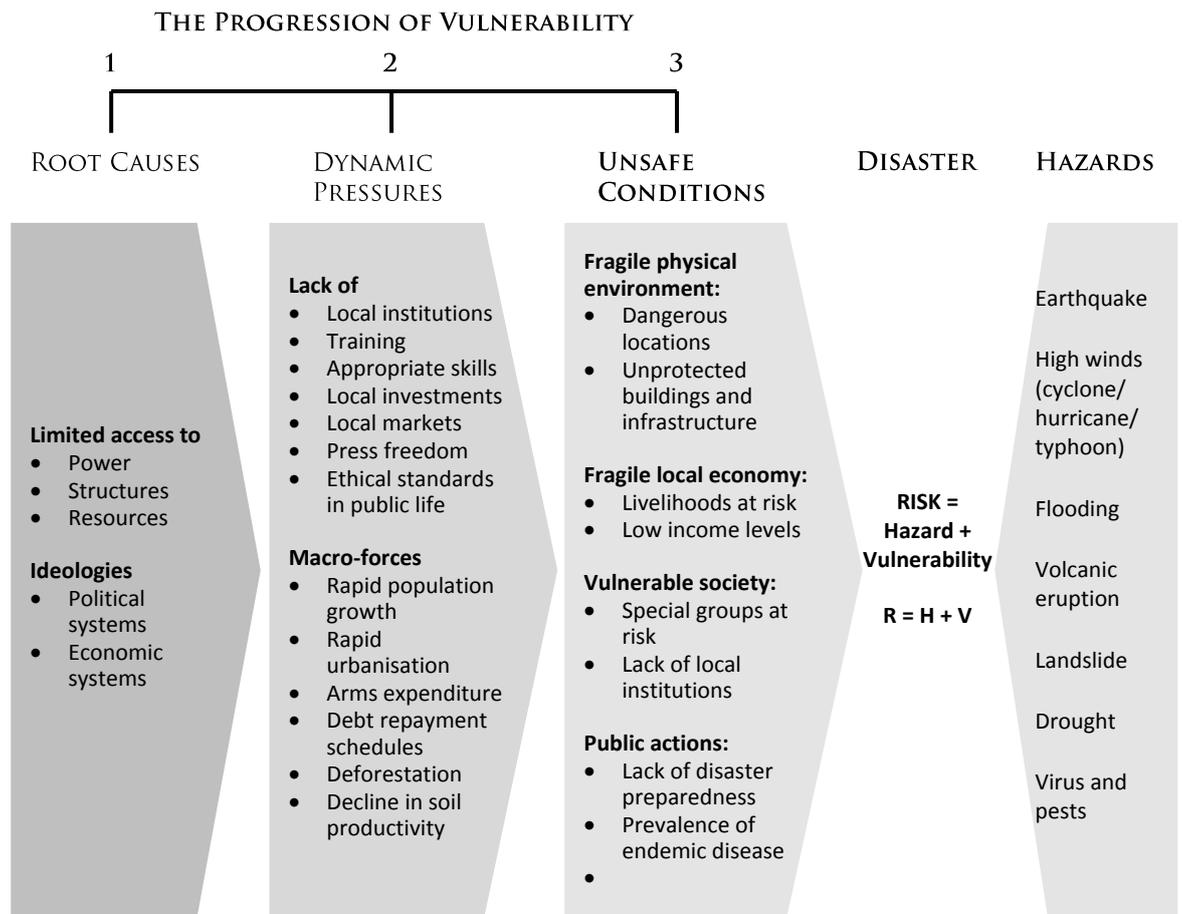


Figure 2-5: Pressure and release model for all hazards (Wisner et al., 2004: pg 51)

When applied to flooding in Hull, the model is shown as in Figure 2-6.

By contrast, a nominal definition identifies detailed characteristics associated with the term that represents the concept and is associated with a positivist philosophy (Hempel, 1952). For example, according to the Centre for Research on the Epidemiology of Disasters (2004: pg 10) an event is classified as a disaster if one or more of the following has occurred: 10 or more people killed; 100 or more people reported affected; a call for international assistance; a declaration of state of emergency. Common to both of these definitions is loss of life, homelessness, disruption of daily life and loss of property and livelihoods. Given the proportion of Hull that was flooded and the number of people's lives disrupted by flooding in 2007, it would be a fair description to say that it was a disaster for the city.

It is important also to weave modern understandings of vulnerability into definitions of disaster. Unfortunately, the word disaster is often misused in common parlance, Oxfam (2007) recently released a report which referred to the number of “*natural disasters*” increasing, when in fact what they are referring to is the increasing occurrence of *natural hazards*, which lead to disasters. Susman, O’Keffe and Wisner’s (1983: pg 264) definition of a disaster as: “the interface between an extreme physical event and a vulnerable human population” takes account of the socially constructed nature of disasters. The idea of *natural disasters* is now outdated as it does not recognise the underlying socio-economic and political conditions that translate environmental pressures into varying degrees of impact (Wisner *et al.*, 2004). In order to encompass all the various elements discussed here, disasters can be defined as the result of the interactions of three systems: “the physical environment”, “the social and demographic characteristics of the communities” and “the constructed environment” (Mileti, 1999: pg 3).

2.2.4 ADAPTATION

Modern understandings of disaster and vulnerability paved the way for a new more flexible approach to flood risk management known as adaptation (Adger *et al.*, 2005). Adaptation is an attempt to modify the socioeconomic system or physical environments in response to changing conditions (Mitchell and Ericksen, 1992). The broad concept of adaptation can be subdivided into a number of different forms. Fankhauser *et al.* (1999) identify two distinctions which can be used to separate adaptations; reactive versus anticipatory adaptations and autonomous versus planned adaptations. Reactive adaptation responds to events as and when they happen. Anticipatory adaptations are deliberate measures taken to prepare for the effects of flooding. This requires foresight and planning. For example, flood risk mapping and zoning. Autonomous adaptations are defined as “natural or spontaneous adjustments” in the face of change (Carter *et al.*

1994). In Hull this may take the form of independently organised flood-proofing of homes by the residents after the flooding in 2007, without help from government or insurance companies. By contrast, planned adaptations are described as “conscious interventions” such as the development of sustainable urban drainage systems in flood prone areas (Fankhauser, *et al.* 1999: *pg* 69). These definitions are perhaps unnecessarily polarised, because often, due to the uncertainty of causality, it is difficult to separate the different types of adaptation from one another.

The role of adaptation was brought into the spotlight by the Pitt Review (2008), which followed the flooding in the summer of 2007. The authors highlighted the need for mitigation efforts to be combined with adaptation measures in order to address the issue in the short to medium term. According to the IPCC Fourth Assessment Report (2007) climate change is already a reality and even if the government’s ambitious target to reduce the UK’s emissions of carbon dioxide by 60% by 2050 is achieved, the climatic forecast for the next 30-40 years is unchangeable due to our historic greenhouse gas emissions. Therefore solutions that account for some inevitable climatic change are essential; society must learn to adapt in the face of climate change (Shaw *et al.*, 2007).

The Stern Review also highlights the importance of adaptation as it is;

“the only response available for the impacts that will occur over the next several decades before mitigation measures can have an effect” (Stern, 2006: pg xxi).

This is because adaptation strategies have relatively short lead times, compared to mitigation strategies, allowing adaptation to be more flexible and quickly change according to the unforeseen needs of the future. The key to successful adaptation to flood risk, as Fankhauser *et al.* (1999: *pg* 68-9) put it, “relies on: timely recognition of the need to adapt, an incentive to adapt, and ability to adapt”, which requires reliable and detailed information and the ability to process that information, something which will be explored in Chapter 6.

2.2.5 RESILIENCE

Resilience to flooding is shaped by the adaptive capacity an individual or community has to bring about changes to respond to flood risks. Underlying, historical socio-economic and political conditions translate environmental pressures into unsafe conditions by reducing capacity to cope with natural hazards through adaptation and or mitigation (Wisner *et al.*, 2004). In the case of flooding, this refers to many things including the

expansion of settlements into floodplains, the diversion and culverting of water courses, the effects of poverty and deprivation and finally government policy.

Resilience is a concept with scientific roots, which can be traced back to ecology, where it was used to describe the potential for an ecological system to recover from a disturbance (Folke, 2006). The ecologist C. S. Holling described it as:

“a measure of the ability of systems to absorb changes of state variables, driving variables, and parameters” (Holling, 1973: pg 17).

Modern definitions of resilience describe it as the ability of a system to recover from perturbations and endure changes whilst maintaining the same function, structure, identity and feedbacks of the original system (Folke, 2006). It has since been used more widely by scholars in other fields who wrote widely about “social resilience” as the capacity of human communities to tolerate major changes to their social infrastructure, such as environmental variability or social, economic and political upheaval (Folke, 2006; Adger, 2000). Disturbances to the system such as flooding also present opportunities for improvement which can reduce vulnerabilities within a community and lower the risk of the situation repeating itself. However, there is also the risk that changes occurring in this environment may create new vulnerabilities either to a different risk or shift the vulnerability to the existing risk to a different population (Wisner *et al.*, 2004).

Resilience exists at a variety of scales: international systems, national systems, community wide and also at the household level. Clearly, there is a need to address flood resilience at each of these levels, for example at the national level in order for crucial infrastructure to be reinstated quickly after a flood (Pitt, 2008). However, as the Pitt Review suggested, in order for a community to resume activities at full capacity, individual households must improve their level of resilience (Pitt, 2008). This would include measures such as replacing carpet with tiles as a floor covering, raising up home appliances on longer legs, using materials such as stainless steel instead of chipboard in kitchens, raising the height of electrical sockets and installing one way valves on household plumbing (Bowker, 2007). Government recognition of the role of flood-resilient housing is increasing; in 2008 Defra undertook a £500,000 feasibility study to investigate the uptake of household resilience measures with the aid of government finance (Defra, 2008). Furthermore, academic responses to government consultation on the Flood and Water Management Act have also supported resilient reinstatement rather than simply reinstatement after a flood event (Sims *et al.*, 2009). One of the barriers to

introducing these measures is that Crichton (2005: pg 115) cites insurers' unwillingness to pay for "resilient reinstatement".

In Hull the uptake of such measures has been extremely low (Pitt, 2008). Many residents in Hull "just wanted to get back to normal" (Interview with Local Planner LAO11 2011: pg 2) rather than make changes to their houses to make them more resilient, which does not indicate that the opportunity for improving the population's capacity to cope with flooding at the house-hold level has been utilised. Taking a slightly wider perspective, the resilience of communities decreases when "critical infrastructure" such as schools are at risk (Coulthard *et al.*, 2007) because it prevents the society from resuming essential activities – if children do not have a school to attend, their parents cannot easily return to work. The government need to "identify and protect critical infrastructure" (ABI, 2007) as research shows that:

"15% of fire and ambulance stations, and 12% of hospitals and schools in England are in flood hazard areas. In total, England has 89 hospitals and 2,374 schools on floodplains. Over 70% have no flood defences." Crichton (2007: pg 11)

The risk that schools in Hull faced was made very clear in 2007 when 91 of Hull's 99 schools were flooded, affecting 36,558 children and resulting a cost of £2.4million to the local economy in loss of earnings through lack of childcare (Coulthard *et al.*, 2007). The Independent Review therefore recommended that:

"extra protection should be given to key social infrastructure. Schools for example could be described as 'social power stations' warranting defence." Crichton (2007: pg 4)

2.2.6 WINDOWS OF OPPORTUNITY

In the aftermath of a disaster, when there has been significant disruption to normal life, there is a period of reconstruction which can take two forms, either the restoration of the normality which existed before, or an opportunity for betterment and resilient reinstatement (Wisner *et al.*, 2004). This opportunity is referred to in the literature as a "window of opportunity" or "policy window" (Penning-Rowsell *et al.*, 2006; Kingdon, 1984). As Michaels *et al.* (2006: pg 984) describe:

"Policy windows are exceptional, fleeting periods of time when there is a greater likelihood of initiating policy change than usual. They arise when the normal policy environment is disrupted."

Faster than usual changes may take place after crisis events when the socio-political conditions have changed – citizens may demand policy or systemic changes to reduce the potential for risk. In this case a “window of opportunity” or “policy window” opens up in which decision-makers are able to push through changes that may previously have stalled. The theory of post disaster “policy windows” was first coined to describe the way that some policy-makers were recognising the value of policy windows and incubating ideas that they could use when the time arose (Kingdon, 1984).

Solecki and Michaels (1994) identify four primary drivers that open policy window in hazard management:

1. A changing political environment arising from a new administration or a change to the legislative balance or simply in response to the national mood.
2. A new problem arising.
3. An existing problem becoming pressing.
4. A disaster, which may expose the problem quickly and publicly.

To add to this, as discussed previously, a policy window may also open as a result of findings from official reports and inquiries which present new information.

More immediate societal issues such as welfare and education hold their place at the top of the policy agenda as they are more critical, predictable and manageable and therefore hazards are often of low priority until they present themselves, disasters are critical to bringing their management onto the policy agenda (Wright and Rossi, 1981; Kingdon, 1984). Historical examples present a strong argument in support of the theory that post-disaster policy windows provide the opportunity for change, after the flooding events in 1947 and 1953, the government rolled out a program of flood defence building (Penning-Roswell *et al.*, 2006). However, it is important to note that policy windows are not *always* generated in the post-disaster environment and furthermore, where they are, they are not necessarily exploited (Solecki and Michaels, 1994).

The development of the literature on disaster policy in the USA has been strong and provides useful insights for policy studies in the UK. More recently the influence of the wider policy making environment on policy windows has been interrogated in work conducted by Dr Thomas Birkland at North Carolina State University. Dr Birkland conducted research on hurricanes and earthquakes in the USA policy area to test the theory of focussing events. Birkland (1997: 22) defined a potential focussing event as:

“an event that is sudden, relatively rare, can be reasonably defined as harmful or revealing the possibility of greater potential future harms, inflicts harms or suggests potential harms that are or could be concentrated on a definable geographical or community of interest and that is known to policymakers and the public virtually simultaneously”.

Ultimately the research supported the theory that crises precipitate policy change, but the detailed analysis revealed that despite apparent similarities between hurricanes and earthquakes, both of which can cause catastrophic and widespread damage to property and risk to life, the two natural hazards had quite different effects on national policy; earthquakes were more readily mobilised as drivers of policy change than hurricanes (Birkland, 1996). Birkland (1996) attributes this variance to a number of different factors; one key influencer is that scientific research into earthquakes is better funded by the USA government – there is a National Earthquake Hazards Reduction Programme, but nothing similar exists for hurricanes. The presence of a recognised expert body gives a more readily available source of credible new policy in the aftermath of an earthquake than a hurricane and enables policy-makers to exploit an earthquake to change policy (ibid.). Whilst there are significant differences between the type of hazards affecting the USA and the UK, varying social, political and economic conditions and also differing institutional arrangements, there are nonetheless useful comparisons to be made across the Atlantic of the drivers of environmental policy change.

In the UK, the primary hazard of flooding is dealt with in a manner that is more similar to the way in which earthquakes are managed in the USA than hurricanes. The UK has a well-established academic research community investigating flooding hazards. Established in 1970, the Flood Hazard Research Centre at Middlesex University is one of the oldest Research Centres in the world concerned with water and environmental management. It would also appear that flood hazard studies continue to be a priority on the government’s research agenda as the government academic funding body, the Natural Environment Research Council, in collaboration with the Met Office and the Environment Agency, is funding a five-year programme of research entitled “Flooding from Intense Rainfall”, which aims to “enable better forecasting and mitigation of hydro-meteorological hazards” and costs £5.2 million. As a result, there is a strong body of academic evidence upon which policy can be forged, though many difficulties translating probabilistic modelling and forecasting into tangible policy remain.

The theory of policy windows was developed upon by Penning-Rowsell *et al.* (2006) using twentieth century flood policy in England and Wales. They described “windows of

opportunity” that opened up after flood events in 1947, 1953, 1998 and 2000, in which catalytic changes in policy were implemented (Penning-Rowsell *et al.*, 2006). Whether or not the theory of post-disaster policy windows is applicable to Hull after the 2007 floods will be explored in more detail in Chapter 4.

2.2.7 RECOVERING FROM FLOODING: RETURNING TO NORMAL OR CREATING NEW VULNERABILITY?

The paradox of flood mitigation is that any works that attempt to alleviate risk may give a false sense of security and encourage further development in the area at risk (Wisner *et al.*, 2004). In the event of a disaster, many recovery attempts simply aim to “get things back to normal” (Wisner *et al.*, 2004: pg 10). However, Wisner *et al.* (2004) challenge recovery efforts which attempt simply to return things to their previous state as it fails to consider the vulnerabilities which created the potential for the disaster to occur in the first place. Furthermore, it does not recognise that the normal state had inherent vulnerabilities which should be acknowledged and changed in order to avoid a repeat of the disaster in the future (Anderson and Woodrow, 1998: pg 5). Any action taken must therefore consider its impact on future flood risk. For example, the reduction in the frequency and magnitude of flooding following the erection of engineered flood defence structures have many unwanted consequences. This has been referred to in a number of different ways by different people; Gilbert White (1945) described it as the “levee effect”, Parker (1995) used the term the “escalator effect” and Rutherford Platt (1999) defined it as the “moral hazard”. The phenomenon was described by Tobin (1995) as follows:

“Once [a levee] has been constructed, the structure may generate a false sense of security to the extent that floodplain inhabitants perceive that all flooding has been eliminated. With the incentive to take precautions removed, few residents will be prepared for remedial action in the event of future floods. Even more costly, however, this false sense of security can also lead to greater development in the so-called safe areas, thus adding to the property placed at risk . . . when the levee does fail, the increase in development can actually raise losses even higher than if no levee system had been constructed in the first place.” (Tobin, 1995: pg 365).

In short, what each of these authors describe is the feeling of security which, in this case flood defences, offer to the people living at risk of flooding, which are not necessarily warranted. In fact, erecting defences has the overall effect of “escalating” the vulnerability of the population, hence the defences have an unintended “moral hazard”

that is simultaneously created by their presence (Platt, 1999). Ulrich Beck (2009) describes this phenomenon as one of the “dialectics of modernity”.

There are many situations in which moving out of the path of danger is not an option. For example for many people in Hull their life and livelihood is tied to the city and therefore they would find it very difficult to move away. The idea that people rebuild their homes on land even though they know that it is at risk is known as “bounded rationality” (Wisner *et al.*, 2004: *pg* 10) or involuntary risk taking (Sjöberg, 1987; Adams, 1995).

This discussion highlights the importance of knowledge in decision-making – what may be considered to be right at the time, may turn out to be very different as the unforeseen consequences become apparent.

2.3 UNDERSTANDING FLOOD RISK MANAGEMENT INSTITUTIONS

This section of the chapter explores the theoretical concept of modern flood governance before going on to examine how the flood governance system in England and Wales that was in place at the times of the 2007 flood came to be as it was by tracing key changes that have taken place in the recent historical trajectory of the system.

2.3.1 FLOOD GOVERNANCE

Terms such as governance have come into usage as part of an ever-strengthening neoliberal economic and political agenda. In the 1980s and 1990s there were a number of changes in the institutional structures and arrangements in England and Wales, identified by Rhodes (1996: *pg* 661):

- pushing back of the boundaries of the state
- improvements in monitoring and evaluation
- reformation of public sector management
- increasing transparency of the public sector

These changes made space for the private and voluntary sector to play a larger part in the delivery of public services. The changing locus of political authority was compared by Jessop (1994) to the “hollowing out” of a log as national government retained the external appearance of power and control whilst in fact many responsibilities had been devolved to local authorities and other local actors or passed upwards to supranational bodies. This led to the need for an alternative term to describe the process by which resources

such as water were governed; “government”, referring to “the state”, was not the sole actor any longer; in fact the process had become the joint responsibility of a number of actors. The analysis of governance is a complex and ever-expanding literature, but for the purposes of this study which examines policy and practice primarily at the local level, the focus of the literature reviewed here is on local governance, with some national context, but not expanding to meta-governance which takes place at the larger scale.

Government refers to centrally organised management, undertaken at least in part by the state, in the Westminster model operating in a top-down hierarchical fashion (Stoker, 1998). Governance, on the other hand, is a relatively new concept, which refers to the shift away from coercion and prescription by governments to governance by devolution and cooperation. The rigid boundaries of governing structures are said to be a thing of the past; we no longer have only markets or hierarchies (Rhodes, 1996).

According to Rhodes (1996: *pg* 653-9), the term “governance” has six different uses:

- **The minimal state** – the reduction of the public intervention and the expansion of markets and quasi-markets to manage the environment instead
- **Corporate governance** – this specialised use refers to the direction given and boundaries set for private sector organisations, to ensure they meet expectations beyond the corporate sphere
- **The new public management** – reshaping public sector management by introducing management methods from the private sector, such as monetary incentives
- **Good governance** – a type of government reform, endorsed by the World Bank; governments should seek to achieve good governance, which they define as; “an efficient public service, an independent judicial system and legal framework to enforce contracts; the accountable administration of public funds; an independent public auditor, responsible to a representative legislature; respect for the law and human rights at all levels of government; a pluralistic institutional structure; and a free press.”
- **Socio-cybernetic systems** – the move from goal directed government interventions to governance as the total effects of social-political-administrative interventions and interactions
- **Self-organising networks** – refers to the shift from *government* to *governance* networks which are made up of organisations from the public, private and voluntary sectors, all working together. The term governance has a broader meaning than government, as management and services can be delivered by a

much wider variety of organisations that resist government direction and have their own independent objectives and practices.

Three key elements from within the six definitions of governance can be used to form the following definition; interdependence between organisations because governance covers the private and voluntary sectors as well as the public sector, continuous interactions between organisations in order to exchange information and achieve mutual aims and governance as the minimal state because networks are independent and retain some autonomy (Rhodes, 1996). This gives a definition of governance as “self-organising, inter-organisational networks” (Rhodes, 1996: *pg* 658). However, one of the recurring components of Rhodes’ definition of governance is that “central government is no longer supreme”, instead we now live in a “polycentric state, characterised by multiple centres” and governance has arisen as a result of “interactive social-political forms of governing”, but whilst much is made of this in the rest of the article, it is not included in his definition, so perhaps an improved version of his definition would be “self-organising, inter-organisational, *semi-autonomous* networks” (Rhodes, 1996: *pg* 658).

For Rhodes, governance is a new and innovative concept which has grown out of the lack of a satisfactory management system to date. For other authors, such as Berger (2003: *pg* 220), governance “refers to the discussion about how to steer society and how to reach collective goals” meaning it is not a new concept, but simply a way of achieving a fundamental societal goal. By contrast, Berger (2003) defines governance in three ways; networks, multi-level management, and as a process. These “networks” are very similar to Rhodes’ “self-organising networks”; they “describe the different societal actor structures and interactions involved in negotiating and delivering policies in any given field” (Berger, 2003: *pg* 221). Furthermore, in this definition governance is “multi-level government involvement”, which means that all levels of government, from local to national, are included in the proposal, development and implementation of policy and each action and decision is made at the appropriate level (Berger, 2003: *pg* 221). Finally, governance is described as a process of management in which different actors from the public, private and voluntary sectors can be included with varying degrees of influence over time (*ibid.*). This is perhaps the most important contribution to the definition of governance as it recognises the importance of power and influence in decision-making, something which Rhodes does not mention explicitly, yet empirical evidence suggests is very important in determining the outcomes of policy decisions (see for example, Roberts, 2004).

The rise of governance is cited as the catalyst for the devolution of power in three directions (Krahmann, 2003):

- “**downwards**” – devolution to subnational entities – fragmentation of political authority – e.g. Regional Development Agencies in the UK.
- “**upwards**” – to the regional or global level – e.g. the EU.
- “**sideways**” – to private and voluntary actors, which may operate nationally, regionally, globally or transnationally – outsourcing of policy-making and implementation from public to private actors and in the formation of public-private partnerships

The devolution of power has been gradual as government has begun to understand the value of local insight and lay knowledge in adapting policies to the local environment:

“At the national and subnational levels, the concept of governance has come to represent political systems in which authority is fragmented among a multitude of governmental and nongovernmental actors to increase efficiency and effectiveness.” (Krahmann, 2003: pg 327)

In some respects governance represents a return to many of the characteristics exhibited by early flood governance networks before twentieth century consolidation - local coordination, multiple actor inclusion, minimised state involvement – suggesting that governance regimes may to some extent be cyclical, which could provide some insights (Bankoff, forthcoming, 19.1.2013).

Governance itself is not inherently characteristically neoliberal, but it has been adopted within a neoliberal framework (Castree, 2008). When civil society is included in the process of governing and the aim of government is to make the public more autonomous and reduce the role of the state at the same time, the effective outcome is a neoliberal policy (Castree, 2008; Peck, 2010).

The terms government and governance are a useful way to conceptualise the changes that have taken place, but a strong criticism of this theory points out that the difference between government and governance is something of a false dichotomy (Sikor, 2008). Government and governance can and do co-exist and indeed are co-constituted in the messy world of reality.

2.3.2 FLOOD GOVERNANCE IN ENGLAND AND WALES

Until the mid to late twentieth century, the management of water and sewerage in England and Wales was highly fragmented and uncoordinated. In 1956, water was supplied by 1,030 different institutions with huge variations in the level of service nationwide (Ofwat and Defra, 2006). During the 1960s, the system was reviewed and modernised and many local authorities consolidated their water supply services into joint boards, bringing the number of suppliers down to 198 by the end of 1973, however, the number of sewerage disposal authorities remained very high at 1,393 organisations (ibid).

Over the last 30 years, the British flood management system has undergone changes which almost directly follow the patterns of decentralisation that were identified in governance theory. Water management has largely been transferred from local control to a more centralised system over the last three decades, though some local influence has remained as local government has retained responsibilities for some flood defence functions as well as an indirect management role through local planning and development control; and local authorities “maintain important centres of knowledge” (Strang, 2004). The focus of this thesis is on modern flood governance and therefore this detailed examination of flood governance networks in England and Wales starts with one of the most pivotal moments in British flood governance, the privatisation of the water industry in 1989. The changing governance networks in England and Wales are mapped out for each stage in the process of decentralisation.

2.3.2.1 *PRE 1989: PRE-PRIVATISATION*

Since the Land Drainage Act of 1930, the government had effectively taken over control and responsibility for all water and sewerage related activities (Scrase and Sheate, 2005). Local Authorities underwent significant reorganisation in 1974 and the Corporation of Kingston-upon-Hull which had had responsibility for all services and operations (including water governance) undertaken within the city, was effectively shrunk down to a much smaller local organisation and another level of government was added above (called Humberside County Council) which had a strategic responsibility for Hull and the surrounding areas (Local Government Act, 1972). Responsibilities for water passed to the National Water Authority which was made up of ten Regional Water Authorities whose area of responsibility was based on river catchments (Water Act, 1973). The Water Authorities had responsibility for the supply and distribution of drinking water, sewerage and sewage disposal, land drainage and flood risk management, fisheries, water quality management, pollution prevention (Water Act, 1973). Under the 1973 Water Act,

the government attempted to consolidate all water functions under the Water Authorities (Scrase and Sheate, 2005). However, after much political wrangling, the Independent Drainage Boards⁶ (IDBs) (with strong board representation from MAFF) kept hold of land drainage powers and therefore flood risk management remained institutionally divided (ibid).

The UK had a strong history of voluntary organisations, the National Council for Voluntary Organisations, the umbrella body for the voluntary and community sector in England, was established in 1919 and the Local Council for Voluntary Service, “Hull CVS” was founded in 1981 (Hull CVS, 2011). Their main role at the time was undertaking advocacy and support work on behalf of the community (ibid.).

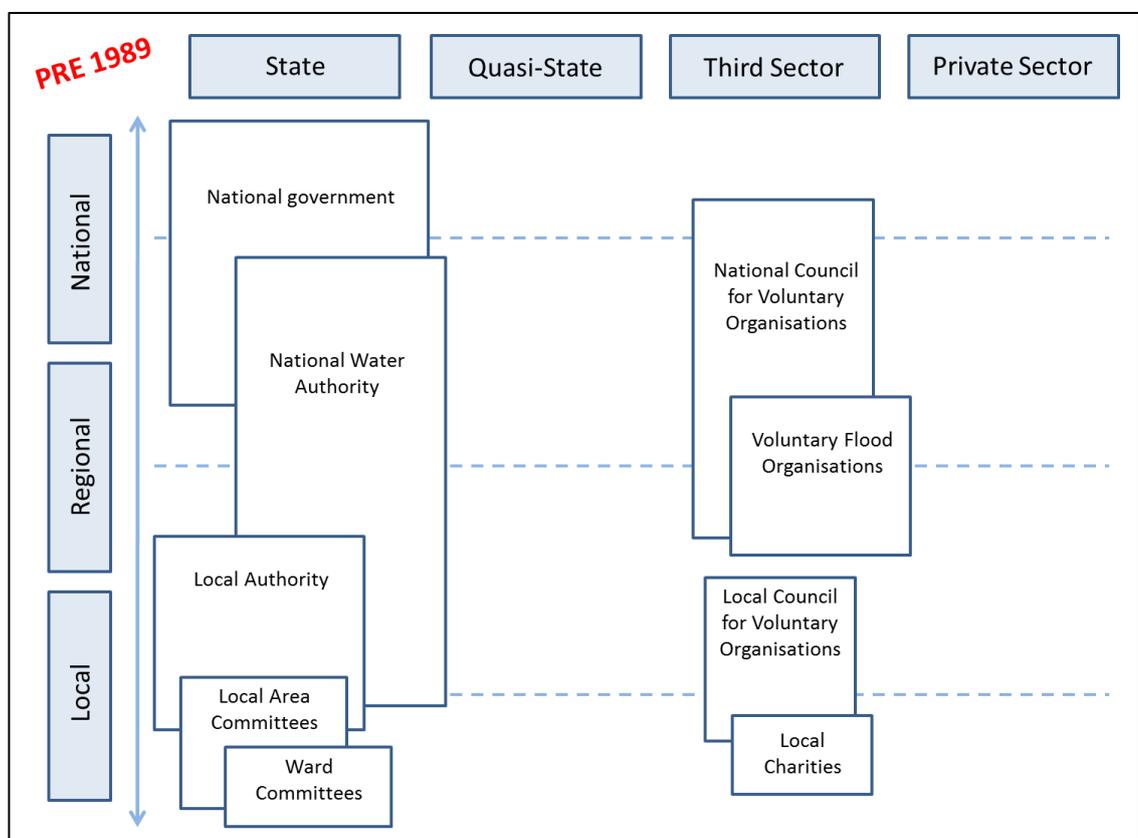


Figure 2-7: UK Flood Governance System before 1989

⁶ Independent Drainage Boards are independent flood risk management bodies who have responsibilities for “ordinary watercourses” (Defra, 2006b: pg 2) in the districts they govern, in place of local authorities who take on this role where IDBs do not exist. IDBs contribute to flood risk management in 9.7% of England (Defra, 2006b: pg 5). They operate under the jurisdiction of the Land Drainage Acts 1930 onwards and grew up in catchments (as opposed to following political boundaries) with particular drainage issues that needed to be addressed such as the Fens (ibid.). IDBs raise their own finance through levies on local authorities and agricultural land users, to fund maintenance of defences and pumping stations, and capital investment, but they also collaborate on projects with the Environment Agency, which makes up around 20% of their expenditure (Defra, 2006b: pg 14).

In 1987 according to Parker (1987: pg 36) “no explicit national policy statement on flood hazard management in Britain is identifiable”. The Conservative Party leader, Margaret Thatcher, was Prime Minister of the UK (having been elected in 1979). Throughout her term in office she pursued privatisation; the sale of state utilities was at its fastest after the 1983 election, the water industry was privatised in 1989⁷ (Bakker, 2005).

⁷ Privatisation can be achieved under a number of different arrangements, with varying degrees of responsibility and risk for the public and private parties. The system under which the public sector retains most control is management or service contracts, which are offered to private sector companies to operate and maintain the water and/or wastewater systems for a fixed period (generally three to five years) in return for a fee (Stottmann, 2000). Alternatively, a private company may lease government infrastructure and take over the revenue stream as well as the operation of the system (ibid). Under a concession system, a private company also takes over the investment arm of the operations (ibid). A Build-Operate-Transfer (BOT) agreement is often used in order to undertake large scale infrastructure developments (ibid). Finally, full or partial divestiture can be achieved through the sale of assets or shares or through a management buyout (ibid). In practice, these arrangements may be more complex and consist of a number of different agreements used in conjunction with one another.

*Examples of varying contract arrangements for private sector water and sanitation provision
(Adapted from Stottmann, 2000: 161)*

Contract Type	Asset Ownership	Operations and maintenance	Capital Investment	Commercial Risk	Contract Duration	Examples
Management contract	Public	Public and Private	Public	Public	1-2 years	Trinidad and Tobago
Service contract	Public	Private	Public	Public	3-5 years	Chile
Lease	Public	Private	Public	Shared	8-15 years	France
Concession	Public	Private	Private	Private	25-30 years	Argentina
Build-Operate-Transfer (BOT)	Private and public	Private	Private	Private	20-30 years	Australia
Divestiture	Private, or Private and public	Private	Private	Private	Indefinite	England and Wales

2.3.2.2 1989: PRIVATISATION

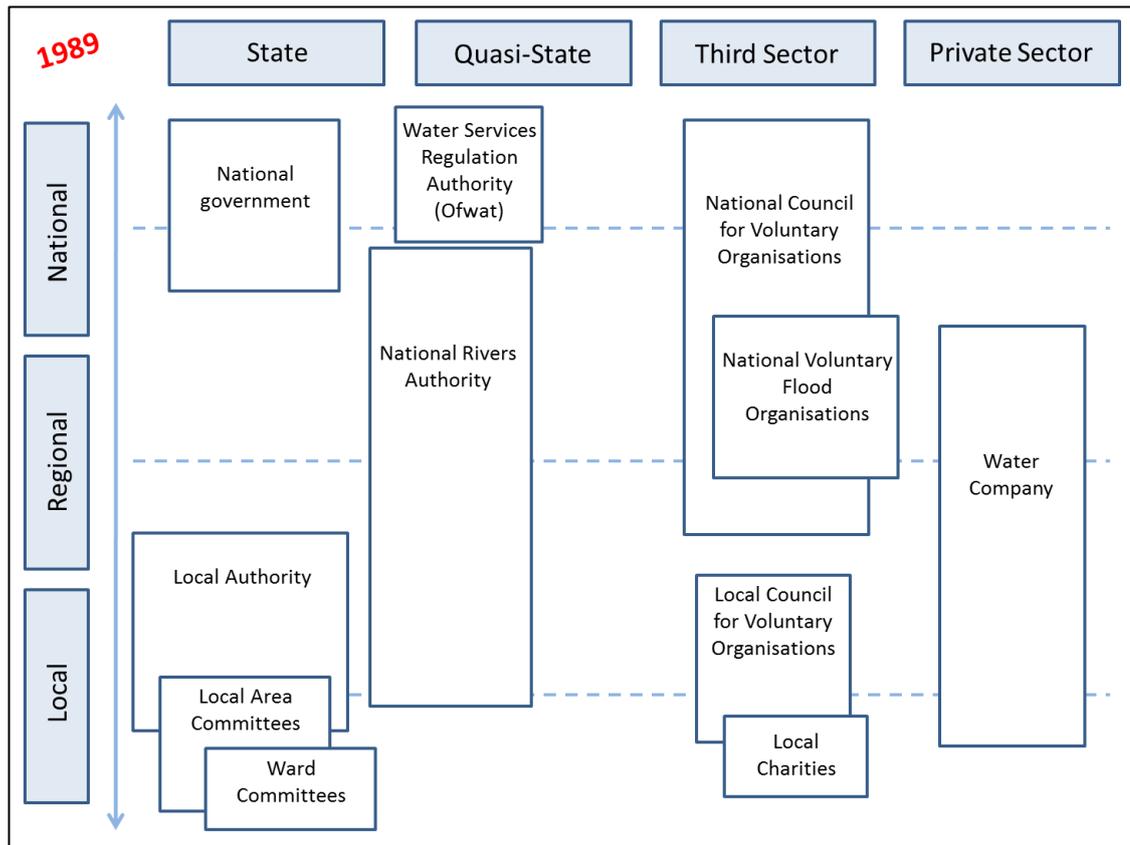


Figure 2-8: UK Flood Governance System in 1989

In 1989 the Regional Water Authorities were sold off to the private sector and Hull came under the jurisdiction of the newly renamed “Yorkshire Water” company who were responsible for the water supply, sewerage and sewage treatment (Water Act, 1989). The remaining duties (land drainage and flood risk management, fisheries, water quality management, pollution prevention) remained with the state, under the control of the newly created National Rivers Authority (NRA) (Water Act, 1989). At the point of privatisation, responsibilities for tidal and fluvial flood risk were passed to the NRA, whereas drainage responsibilities were transferred over to the private water companies (and internal drainage boards where they existed), which created an institutional division of flooding responsibilities (Ofwat and Defra, 2006). The NRA was made up of a number of locally administered offices which were based on the physical boundaries of water catchments rather than political administrative boundaries, which has since created unusual arrangements for policy coordination and collaboration with other agencies including local government. A Water Services Regulation Authority (Ofwat) was also set up to oversee the economic regulation of the privatised water and sewerage industry in England and Wales (Water Act, 1989).

2.3.2.3 1990-2006: POST-PRIVATISATION

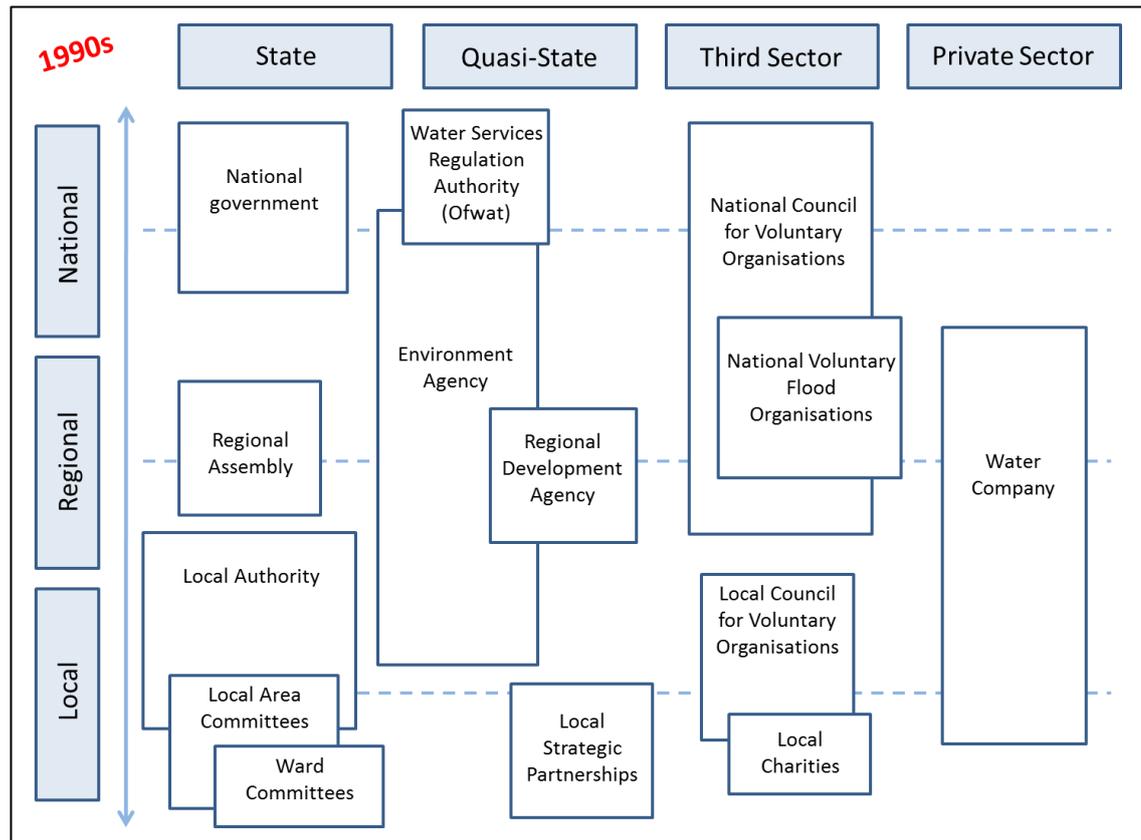


Figure 2-9: UK Flood Governance System 1990-2006

As the effects of privatisation and the pursuit of neoliberalism started to be felt in the 1990s, there was a significant growth in the third sector (Hall, 2011). In 1991, the National Association for Voluntary and Community Action was founded to promote the local third sector nationally (Hull CVS, 2011).

In 1996 there was a change to the environment department of central government; the National Rivers Authority (NRA) was replaced by the Environment Agency (EA) (Environment Act, 1995). As a non-departmental public body of the Department for Environment, Food and Rural Affairs, the EA was granted more autonomy than had the NRA (Scrase and Sheate, 2005). The Environment Agency became the principal flood risk management operating authority with the power (but not the legal obligation) to manage flood risk from designated main rivers and the sea (ibid.). They also became responsible for raising public awareness of flood risk, flood forecasting and warning and a general supervisory duty for flood risk management (Environment Act, 1995).

At the national level, the general election in 1997 brought a change of government and the New Labour party embraced devolution to the regional level and set up Regional Development Agencies (RDAs) (Regional Development Agencies Act, 1998). The RDAs

were non-departmental public bodies established to promote development, primarily economic, in each of England's Government Office regions, taking over responsibility from Government Offices for administering European Union regional development funds, which includes grants to tackle major flood protection projects (Drake, 2009). The Yorkshire Regional Flood Defence Committee which manages flood risk in Hull and the rest of Yorkshire has a very large annual budget of £23.9 million in the 2003/04 financial year, one quarter of which is drawn down from the European Union by Yorkshire Forward, Yorkshire's Regional Development Agency (Edie, 2003). The funding is spent on "schemes which would not otherwise qualify for resources from national flood funding but are important locally" (Interview with Local Councillor LAM7, 2011). An extra level of regional government, the Regional Assemblies, were also introduced by national government to give political oversight to regional governance (Regional Development Agencies Act, 1998).

At the local level, Local Strategic Partnerships were introduced across England in 2000 to bring together representatives from the local statutory, voluntary, community and private sectors to address local problems, allocate funding and discuss strategies and initiatives (Gaventa, 2004). They aim to encourage joint working and community involvement, and prevent silo working with the general aim of ensuring resources are better allocated at a local level (*ibid.*). Whilst these aims are commendable, the fact that such a scheme was needed highlights how overcomplicated and confusing the water governance system had become (Ashworth *et al.*, 2007). The duties once picked up by the state were now being shared out amongst governmental, quasi-governmental, private and voluntary organisations (Scrase and Sheate, 2005). Government restructuring and the privatisation of the water industry has contributed to the emergence of a more complexly organised multi-level governance where flood risk management strategy is the product of national, regional, sub-regional and local policy interventions and institutions (Drake, 2009).

2.3.2.4 2007: HULL FLOODS

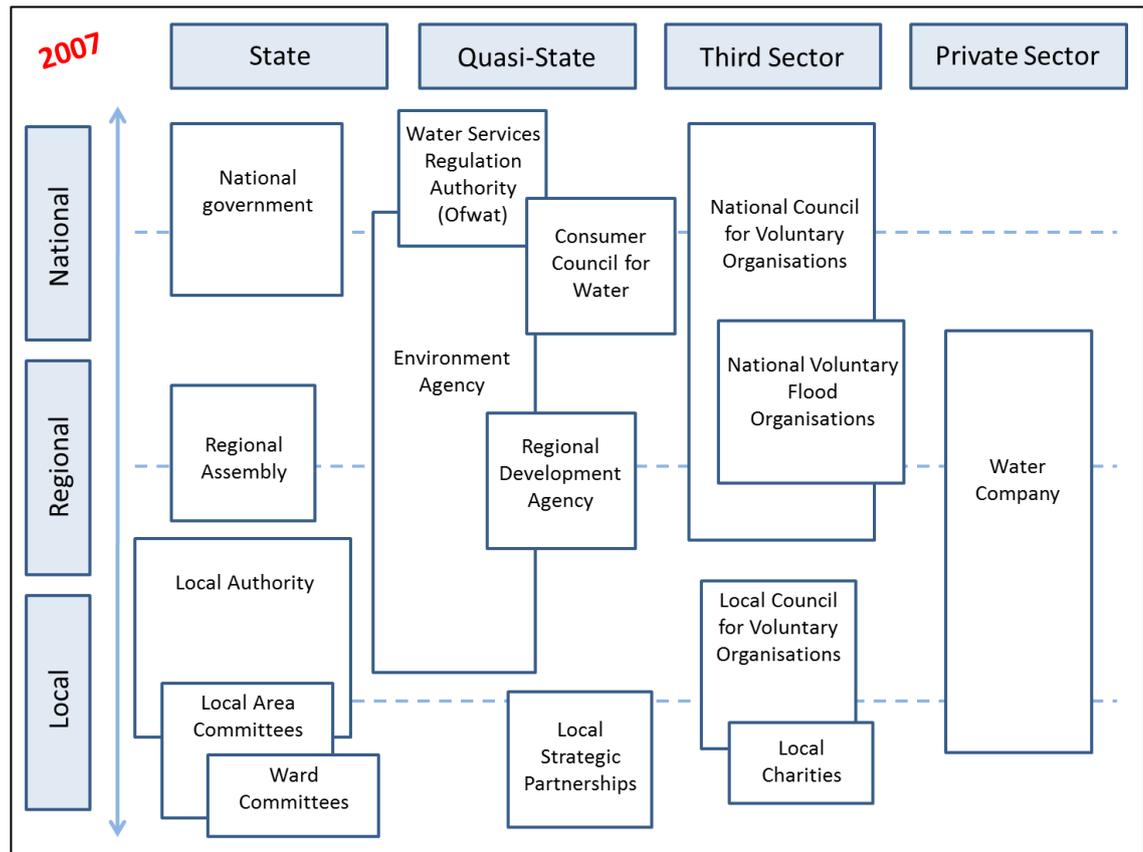


Figure 2-10: UK Flood Governance System in 2007

The 2007 floods in Hull exposed the systemic and institutional failings in the intricate web of responsibility surrounding flood risk and called into question the viability of such a complex governance system. The theoretical cornerstone of good governance is the inclusion of multiple actors in the network in order that a wide range of views can be represented within the decision-making process (Rhodes, 1996), but there is still much debate surrounding the advantages and disadvantages of various levels of fragmentation of environmental governance structures (Biermann and Bauer 2005; Vogel 1997). Action is very difficult to implement in a pluralistic democratic system such as the UK and this complex power-sharing arrangement can have a significant impact on the development and implementation of policies, retarding progress (Irvin and Stansbury, 2004; Ashworth *et al.*, 2007).

Privatisation transferred water services, including the assets and the operation of the water supply and sewage disposal system to the private sector (Bakker, 2005). Along with the tangible assets, there was also a transfer of expertise from local authorities to the private companies and as Bakker (2005: pg 452) put it, “engineering expertise has been supplemented by that of economists” which inevitably has some influence over the

decision-making. It is difficult to accurately gauge the effects of this loss of in-house expertise, but a report produced by Defra and the Local Government Association (2008) revealed that by this time on average the number of engineers and technical staff employed in each local authority had fallen to less than two (Defra/LGA, 2008: *pg 10*).

This analysis of the historical trajectory of flood governance reveals the way in which responsibility for flooding has been divided up over the years in the context of wider changes in local, national and regional government.

2.4 PUBLIC ENGAGEMENT WITH FLOOD RISK

Kingdon (1984) asserts that disasters alone are not normally enough to propel risk management to the top of the policy agenda, the social, economic, political and cultural conditions must also be right. In order to understand the way in which policy windows may be opened up after a flood (or other similar crisis event), the way in which the public perceive flooding and engage with the flood governance process must be explored in order to understand the social and political conditions needed for change. This section gives an overview of environmental governance and the public's role.

There are several forms of public engagement in policy-making: at the most basic level, when citizens vote they express their political opinions (Roberts, 2004). More active people may have some political party involvement, they may subvert the parliamentary system and become involved in interest groups or they may channel their view through the media (Roberts, 2004).

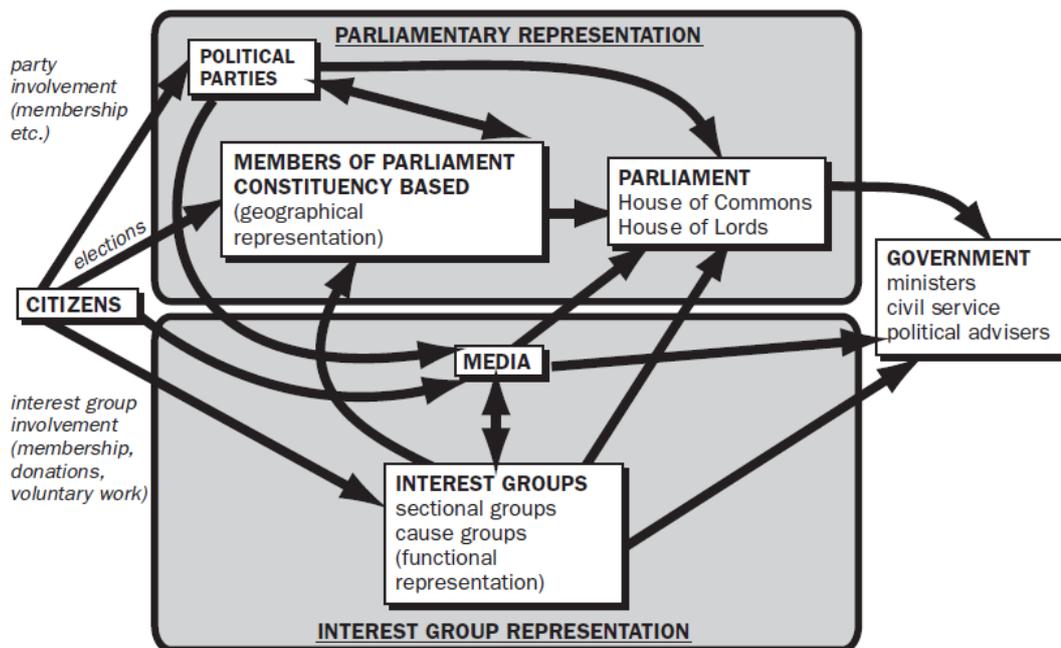


Figure 2-11 Modes of citizen involvement in environmental policy (Roberts, 2004: pg 143)

Parliamentary based representative democracy is a system in which each person has one vote with which they can contribute to the choice of candidate to represent their locality for a specified period. The elected representative then acts in the interests of his area on a larger stage (Dalton *et al.*, 2001).

Blinder (1997) argues that political decision making in parliamentary representative democracies is often of a short-term nature; the political incentive is to enact policy that will have visible rewards within the term of office in order to win votes at the next election. According to the constitution, no UK parliament can bind its successor to a particular policy. This has led Clayton *et al.* (2006) to describe the environmental policy-making framework in the UK as short-term and disjointed, but it is also important to recognise that the relatively short terms of office that governments serve for means that institutional arrangements and policy come under scrutiny and reassessment each time a new government is appointed. Crises such as flooding put stress on the existing representative democratic system because they indicate some failings in government (Dalton *et al.*, 2001). As Blinder (1997: pg 116) described,

“short-term electoral considerations and political gamesmanship have fuelled much voter resentment.”

This can lead to citizens who feel disillusioned with the system to search for an alternative channel for their political opinions, motivated by what Dalton *et al.* (2001: pg

148) term “political dissatisfaction”. Direct democracy is distinguished from representative democracy as citizens are directly involved in the processes of democracy and government, rather than by proxy through their elected representative (Dalton *et al.*, 2001; Buček and Smith, 2000). Benedick (1999) advocates the “inclusion of participants at all levels of the decision-making process”. There are a number of difficulties with including the public in policy-making. Horlick-Jones *et al.* (2007) studied public participation in policy-making on genetically modified crops in East Anglia and described it as a success, but also pointed out that there was a significant bias in the sample as it is often those who are most interested in a subject or politics in general who participate in consultation. There are also further difficulties with public engagement in flood risk management planning as the public “find it difficult to engage due to the complex institutional structure of flood risk management in England and Wales” (Ashley *et al.*, 2007 p.70).

2.4.1 PUBLIC PARTICIPATION THEORY

Public participation and the inclusion of multiple actors in policy-making is one of the cornerstones of contemporary Western governance. The proposition here is that the more views and voices that can be directly included in discussion, the more balanced the debate will be and therefore the more likely it is that a decision can be reached that is most appropriate for the situation through a process of “consensus through linguistic dialogue” (Day, 2006: *pg* 4). This does not guarantee perfect decision-making but it legitimates the process and allows decisions and policy to be contested (Habermas, 1981). However, this form of rationality relies upon personal commitment, common understanding and involvement, which can be lost in an age of disintegration of social responsibility (*ibid.*). Whilst Habermas (1981) advocates public engagement as a way to establish democratic legitimacy, he worries that the public may be losing their ability to debate and critique issues. As Day (2006: *pg* 8) put it, “power and strategic interests play the leading part in the coordination of political processes today, not dialogic, communicative action”. The problem is that “the public” can be difficult to locate and include (Featherstone *et al.*, 2009). “The public sphere is a highly complex network of various public sphere segments” which span various scales and mediums (Day, 2006: *pg* 185). There are many different modes of public interaction along a spectrum of active and passive, at one extremity of which is complete detachment from decision-making, at the other is public control of decision-making (Russell, 2008). The varying degrees of participation can be separated out as shown in Arnstein’s classic diagram Figure 2-12.

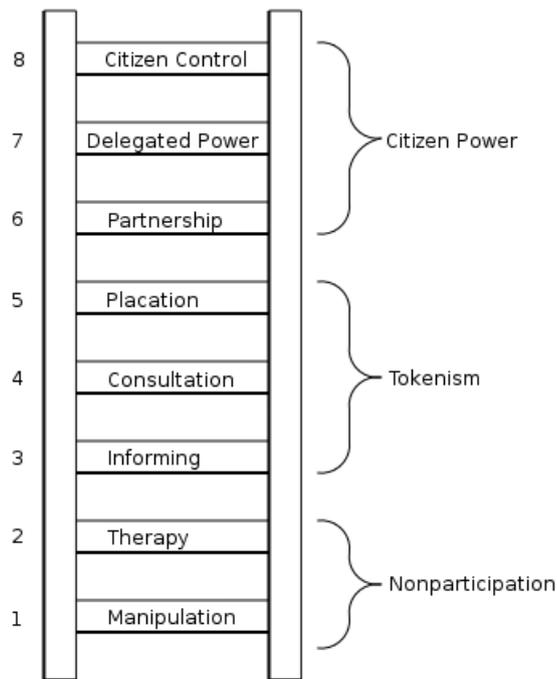


Figure 2-12: Ladder of Citizen Participation
(Arnstein, 1969)

The ladder indicates the progression from “nonparticipation”, through varying degrees of participation in which citizens have increasing power and influence by the top. The middle ground, referred to as tokenism, is indicative of the way in which some approaches to participation which do not facilitate involvement in decision-making, but simply bring in the public at the end of the process to “educate” them (Arnstein, 1969). This can lead to feelings of resentment and time wasting. Citizens need to feel as though their input is worthwhile and can effect change, not that they are consulted retrospectively when decisions have already been taken and consultation risks becoming “tokenistic” (Arnstein, 1969).

The inclusion of lay knowledge and the public voice is often difficult in policy-making as decisions are complex, interlinked with other policies and politics and must often be made on incomplete scientific evidence and probabilistic recommendations which makes the process inaccessible to the public (Roberts, 2004). Chantal Mouffe (2005: 41) says that:

“what is needed is the creation of forums where a consensus could be built between experts, the politicians, the industrialists and citizens on ways of establishing possible forms of co-operation among them.”

In other words, science needs to become more accessible to non-experts.

Whilst the practicalities of public participation are fraught with difficulties, authors such as Swyngedouw (2007) have observed a fundamental shift in the politics of environmental governance, from the traditional discursive to a post-political state. Environmental risk such as flood risk is mobilised as a perpetual threat and the rhetoric of fear posits that we must act immediately in order to change things. In this sense there is a depoliticisation of proceedings through fear of apocalypse. Despite such criticisms, governments persist with public participation and engagement schemes.

2.4.2 PUBLIC PARTICIPATION AND POLICY

As public scrutiny of government policy and practices have become more widespread, public engagement has become increasingly common as a way of improving the legitimacy of decision-making (Roberts, 2004). The promotion of public participation with local government can

“enhance user involvement, promote democratic legitimacy and develop the responsiveness of organisations to one of their key stakeholders” (Farrell, 2000 pg 31)

There are international agreements, such as the Aarhus Convention⁸, which were set up to specifically address “access to information, public participation in decision-making and access to justice in environmental matters”. The Convention:

- Links environmental rights and human rights
- Acknowledges that we owe an obligation to future generations
- Establishes that sustainable development can be achieved only through the involvement of all stakeholders
- Links government accountability and environmental protection
- Focuses on interactions between the public and public authorities in a democratic context.

(UNECE, 1998)

⁸ The United Nations Economic Commission for Europe Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, is more commonly referred to as the Aarhus Convention after the Danish city in which it was held in 1998. It is a multilateral agreement designed specifically to encourage transparency and public accountability in environmental decision-making in European countries which came into force in 2001 (UNECE, 1998).

The importance of the integration of citizen and government actions could not be clearer: democracy must do more than rely on electoral accountability by strengthening citizen involvement.

At the national level, the Labour Government that was in power at the time of the 2007 flood had an explicit policy of public engagement across all areas of policy.

“Councils need a new democratic legitimacy... [they] should use surveys, citizens’ juries and other methods to make it easier for people to participate in local affairs” (Blair, 1998: pg 2).

In the quote the causal link between participation and legitimacy is clearly asserted. The Conservative-Liberal Democrat Coalition Government which followed has also pursued participatory decision-making, through its own strategy of “The Big Society” which aims to encourage people to “take charge of local services” and thereby relieve local authorities of some of their responsibility and expense (Cabinet Office, 2010).

At the local level, an interesting study for the Office of the Deputy Prime Minister in 2002 showed that local authority public engagement was influenced somewhat by the political persuasion of the ruling party. Labour controlled local authorities on average ran the most consultation initiatives, averaging 11.3 per council in 2001; they were followed closely by Liberal Democrat controlled local authorities who on average ran 11.1 schemes and Conservative controlled councils were behind again, averaging only 10.1 initiatives per local authority (Birch, 2002: pg 34). The changing uptake of public participation according to the politics of national and local government reflects the way in which decision-making on public policy more broadly is politicised by its reliance on the agendas of political parties (Eden, 1998).

2.4.3 CONCEPTUALISING THE COMMUNITY

Increasingly UK government legislation stipulates some form of community involvement and therefore policy-makers are becoming increasingly entangled with community affairs (Day, 2006). The involvement of the general public in deliberative democracy without a full and proper understanding of communities risks becoming “tokenistic” (Arnstein, 1969). Due to the complexities of communities and the variations between them, there is no agreed method of engagement; there is not even an agreed definition of the word *community* itself. The definition of community is highly contested by both academics and practitioners alike; it is as a “wide and diverse” term which can even at times be “inconsistent” and “dangerous” (Day, 2006: pg 1). Weber (1978) focused on the

notion of the “communal”, positing that community can be found wherever people interact with one another. Others such as Durant (1939: *pg 9*) declare that a community is “a territorial group of people with a common mode of living”. The idea that a community is linked to territory or geographical proximity is traditional in the UK and examples of such communities include country villages such as Cottingham outside Hull or small areas of towns or cities such as Newlands in Hull.

Benedict Anderson (1936: *pg 6*) describes “an imagined political community [that is] imagined as both inherently limited and sovereign”. It is imagined because individuals “will never know most of their fellow-members... yet in the minds of each, lives the image of their communion”; it is limited because “even the largest... has finite, if elastic boundaries”; and it is sovereign because “regardless of the actual inequality and exploitation that may prevail... the nation is always conceived to as a deep, horizontal comradeship” (Anderson, 1936: *pg 6-7*). Examples of imagined communities extend to include football fans and online communities. Thinking more broadly, community may also refer to “all forms of relationship which are characterised by a high degree of personal intimacy, emotional depth, moral commitment, social cohesion and continuity in time” (Nisbet, 1967: *pg 47*).

Some of these definitions may seem dated because social norms have changed so much in the last century, indeed their compatibility with modern society has been much discussed. Giddens (1990) asserts that modernity is increasingly associated with the undermining of stable social relations and a secure sense of the self which has a hugely detrimental effect on any potential community links. In other words, the social conditions of the postmodern world are entirely contradictory to community as the rise of individualism has led to our actions becoming merely of “episodic significance” (Bauman, 2001: *pg 47*). However, the detachment of individuals from predetermined communities has led to a rise of *voluntary* communities, defined not by geography but individual interests (Bauman, 2001). Communities will be tailor-made “according to taste or interest”, such as the environmental movement (Day, 2006: *pg 215*). Life is dynamic and it should not be assumed that because communities do not necessarily exist in exactly the same form as they have in the past that they are extinct. It is important not to overlook the existence and contribution of the postmodern community in whatever form it takes and furthermore, that these “new” communities may exist concurrently with “old” forms of community.

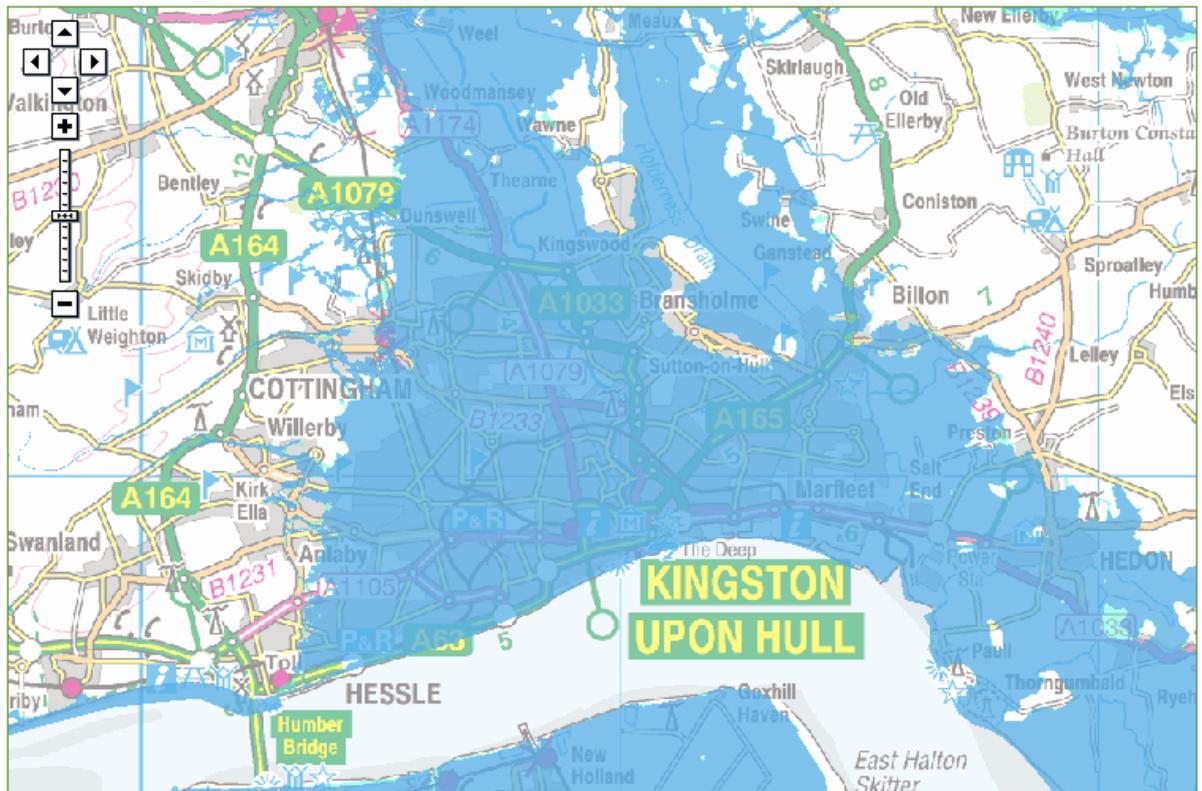
Perhaps as a result of the flexibility and responsiveness of some new forms of community, where political boundaries and institutional arrangements have made it

difficult to produce strategic and holistic environmental governance, civil society organizations have been more successful in bridging political frontiers and promoting environmental goals (Debarbieux and Rudaz, 2008). The primary criticism levelled at community groups is that this is often at the expense of democratic accountability and legitimacy (Allen and Cochrane, 2007). The inclusion of individual “agents outside the political or corporatist system ... on the stage of social design” can lead to the emergence of “sub-politics” in which individuals may have unduly strong power and influence over the decision-making process (Beck, 1994: *pg* 22).

2.4.4 PUBLIC UNDERSTANDINGS OF FLOOD RISK

Nature is all around, from food in the fridge to the air passing through our lungs, but this relationship is rarely scrutinised as intensively as it is after a ‘natural disaster’. In pre-modern times, disasters were explained away as acts of God, but in due course as science progressed, natural hazards were identified as the root of disasters (Wisner *et al.* 2004). There has been a gradual re-evaluation of the way in which humans interact with environmental risk. In order for people to understand risk, “the risks involved in disasters must be connected with the vulnerability created for many people through their normal existence.” (Wisner *et al.* 2004: *pg* 4).

Socially constructed perceptions of flood risk are very important to managing flood risk because individuals are more likely to undertake household level mitigation and adaptations to protect themselves against flooding if they perceive the risk to be sufficiently high to warrant the cost (Slovic, 1986). Haggett (1998) described the knowledge of risk that is held within a public group as “community memory”. According to Office for National Statistics, “11% of all new dwellings built in England between 1997 and 2000 were in areas defined as at flood risk by the Environment Agency” (Defra/Environment Agency, 2005: *pg* 3). Since almost the whole of the city of Hull is deemed to be at risk of flooding, as shown in Figure 2-13, almost any new properties built in Hull will be in an Environment Agency designated flood risk area.



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Figure 2-13: Environment Agency Flood Risk Map (2006)

Nevertheless, the number of properties in Hull has steadily risen over the last 80 years, as shown in Table 2-1.

Table 2-1 Number of households in Hull 1931-2011

Census Date	Total Number of Households
1931	76,843
1951	87,998
1971	97,264
1981	97,968
1991	103,228
2001	104,288
2011	116,859

Source: 1931-2001 www.visionofbritain.org.uk/unit/10168387/cube/HOUSEHOLDS, 2011 www.neighbourhood.statistics.gov.uk

The fact that it is profitable enough for so many developers to invest in building these properties indicates that the market for selling homes in floodplains is buoyant, which calls into question current levels of community knowledge about flood risk (Crichton,

2005). The pertinent question that arises therefore is how does this community knowledge or memory about flood risk change over time? This will be addressed in Chapter 6.

2.5 CONCLUSION

Climate change dominates the current environmental policy landscape, and it is very possible that as a result of climate change, flooding will become more commonplace which makes the link between the two inextricable (Trenberth *et al.*, 2007). However, this chapter has also shown how flooding has a long history that is interwoven with the growth of cultures and settlements, particularly the city of Hull which has very strong connections with water throughout its history. In places such as the UK, flooding is likely to be one of the most noticeable effects of climate change and therefore hold its place as the most common natural hazard facing this country (UKCIP, 2009; Wilby and Keenan, 2012).

Not only is flooding the most common hazard in the UK, it is also the most common disaster and this chapter examined the various aspects of flooding disasters: mitigation, vulnerability, adaptation and resilience. This led on to a discussion about how communities recover from flooding and whether they return to “normal” or make changes to their environment and how this can paradoxically produce new vulnerabilities, in the way that the false sense of security generated by a flood defence can falsely encourage new development there (Wisner *et al.*, 2004; White, 1945).

The concept of governance was introduced in order to explain the way in which flood risk management has been organised and managed by various actors and institutions over time. The historical trajectory of flood governance in England and Wales was traced back over the twenty years or so preceding the 2007 floods, through privatisation and increasingly fragmented institutional arrangements. Finally, this chapter explored the role of the public engagement with flood risk – examining different conceptualisations of the community which might get involved and how different individuals and communities perceive flooding. This was useful in raising the question of how important the community is in shaping the political agenda and as a result framing the debates on flood governance.

The empirical chapters which follow in this thesis will build upon these theoretical debates and add the case study of the 2007 flood event in Hull for comparison with other flood events that have already been examined.

2.5.1 RESEARCH QUESTIONS

The core aim of this research focuses on what facilitates or forecloses the adoption of flood governance regimes and the impact of this on policy and practice. In order to achieve this aim areas of questioning have been identified.

Firstly, in order to build upon the literature on policy windows,

- *Did a post-disaster policy window open in 2007? If so, were any flood-related policies implemented? And what aspect of flooding did they focus on?*

Since the likelihood of any policy window being exploited is dependent on the social and political context,

- *How do the public participate in flood governance normally and in the aftermath of a flood? How successful is the system of representative democracy at incorporating public views into decision-making? What is the most appropriate form of public engagement in flood policy?*

And finally, in light of the emergence of the new risk of pluvial flooding in Hull in 2007,

- *How is knowledge about flooding generated? And how does this influence pluvial flood risk management in the future? How should pluvial flood risk be addressed in the future?*

These research questions will be addressed in Chapters 4, 5 and 6 respectively in order to address the role of the 2007 flooding crisis in driving flood risk policy in England at the local level, in Hull, as well as the national level.

3 METHODOLOGY

3.1 INTRODUCTION

This thesis re-examines the institutional arrangements of flood governance in England and Wales and focuses on how the system changes, what drives these changes and which policy and practices are adopted or rejected. The thesis focusses in particular on the city of Hull as a case study and the flooding in 2007 as a crisis event which had the potential to instigate changes to the system. This thesis is multidisciplinary and therefore uses a range of methods to capture the information required to conduct this research. The primary source of data was generated during thirty-one in-depth qualitative interviews conducted between July 2010 and February 2011, but further information was gathered from personal observations of Hull City Council meetings and finally policy insights were collected from the analysis of government documents.

Case studies ground academic research in reality and provide context that can be integrated with local level information and knowledge more readily (Griffin, 2009). This thesis uses the example of Hull to reconcile academic theory on environmental governance with local experiences and knowledge of flooding.

3.2 FRAMING THE PROJECT

This study was initially conceived as part of a wider ESRC funded research project on flooding in Hull entitled “Subcontracting Risk: Neoliberal Policy Agendas and Changing Perceptions of Flood Risk Management” being undertaken by Professor Graham Haughton (Human Geography), Professor Tom Coulthard (Physical Geography) and Professor Greg Bankoff (History). The provisional research question set out for this PhD research was “what were the institutional failings associated with the north Humber floods in 2007 and how were these subsequently addressed by all those involved?” However, this was not heavily prescriptive or restrictive and has evolved over the course of the research.

3.3 RESEARCH PHILOSOPHY

Whilst each piece of research undertaken in academia is novel in some way, there are also many common questions in the broad philosophical underpinnings which can

influence the results and therefore need to be addressed in all research. These are: the researcher's epistemology, ontology and perhaps the most obvious cause of variations in research is dictated by the chosen methodology; the tools and techniques that are used to conduct the investigations (Kitchin and Tate, 2000: *pg 6*).

All research is situated (Haraway, 1991) and in this study the requirement for the researcher to interpret and correlate information from a wide range of sources made the study impossible to carry out in a completely neutral and objective fashion. Instead, the researcher is the key in using an interpretive methodology to build a picture based on a variety of different sources and each is triangulated against others to assess its reliability (Jasanoff, 2004). Using an interpretive methodology is typical of an inductive reasoning approach in which the research is led by the data. An inductive piece of research draws theories from observations of patterns and irregularities identified in data, whereas a deductive piece of research starts with theory and formulates hypotheses, which are then proven or falsified by the data collected (Kitchin and Tate, 2000).

The methodology is heavily data-led and the aim of this study was to produce meaningful and relevant observations and commentary based on specific empirical evidence in order to inform and shape flood policy in the future. As Peck (1999) declared, policy-based research is one of the principal ways in which academics can have an influence on the world. Policy shapes the world we live in, affecting the daily lives of us all, and so researchers have an "obligation" and a "moral duty" to "inform and shape" the process of policy, in order to improve the outcomes (Martin, 2001: *pg 190*). In order to become more policy relevant without losing the academic grounding that makes academia such a valuable arena, research must be embedded within the wider debates of society, rather than just academics "talking to each other" (Massey, 2001: *pg 12*). Theory and practice must be linked in such a way that the key issues of society can be addressed, alternative policies suggested and the best way to influence policy explored; governmental policy-advisors have only so many ears, and it may be that it is more effective to work with campaigning groups, NGOs and charities, and to engage in wider ways of influencing public opinion: there cannot just be policy; there must also be politics (Martin, 2001; Massey, 2002: *pg 656*). The changing scales of flood governance, from up-scaling to the EU and other supra-national organisations, to down-scaling at the local level presents the opportunity for researchers to engage from a greater range of "angles, guises and positions" than are widely acknowledged (Banks and MacKian, 2000: *pg 253*). At a local level, many are engaging with policy research, often overlooked by those who view policy as a resolutely top-down process. This research engages with

public policy on flood risk at the local level, through a range of different interested parties, in order to critically examine the marriage between top-down government policies and bottom-up community action.

3.3.1 ONTOLOGY

With a background in Environmental Governance and more broadly Human Geography an examination of the workings of governance arrangements and how these were affected by the flooding in 2007 was key to understanding flood policy-making and risk management. Social science is the study not just of reality, but also of people's perceptions of reality, which is socially constructed and therefore densely entangled with value judgements that can be variable (Punch, 1998). Sayer (2006) gives the example of the discovery that the world was in fact round rather than flat and posits that this discovery did not change the shape of the world, only our perception of it. In this research, the way in which pluvial flooding changed from being unmentioned in policy to be accepted as a highly risky phenomenon is an example of the way in which social understandings of reality change over time with new experiences and information. Both examples highlight how important context is in the construction of knowledge and what constitutes a reality. Since an analysis can be wrong, it suggests that knowledge is not simply a reflection of reality, but a more complex, contextual subject for research. This is reflected in the three empirical chapters of this thesis with the first examining how the environmental crisis presented by flooding can open up a policy window in which changes may be enacted, the second chapter explores how successfully the public perceive the institutions to be operating, and the final empirical chapter examines how pluvial knowledge is generated and how the issue of flooding more generally is framed.

3.3.2 EPISTEMOLOGY

Through personal experience of living in an area of Hull which had been heavily flooded in 2007, it was possible to develop a thorough understanding of the way in which the events had unfolded on the ground, how people had been affected and to get a sense of the scale of the event. This was possible because there were people who had been flooded everywhere in everyday life who talked about their experiences without any reference to this research, simply as a matter of course.



*Figure 3-1 Flooded road in Hull
(Photo Credit: BBC News, 2007)*

For example, the owner of one of the shops in Figure 3-1 that was flooded in 2007 was forced to throw away all his shop furniture which had been contaminated by untreated sewage in the flood waters. Flooding was a very live issue at the time of this research and everyday life became an immersive research environment. Since a researcher's epistemology, the way in which their knowledge is constructed, is based on prior experiences and conjecture (Kitchin and Tate, 2000), the experience of living in the community in Hull had a big influence on this research. For example, giving a good understanding of the names of places and streets people referred to during interviews which helped to develop a rapport with them.

3.3.3 RESEARCH STRATEGY

This research takes inspiration from a "grounded theory" methodological approach. Developed in sociological research by Glaser and Strauss, grounded theory involves the constant comparative method of building theory based on the systematic analysis of data, contrary to conventional methods which first start with a hypothesis and use the data to test this (Glaser and Strauss, 1967: 2).

One important characteristic which identifies this study with grounded theory is that the research began with a very broad remit; initially the research broadly explored the effects of the 2007 flooding on the city of Hull and the surrounding area, and it was during the

course of the research that the city took on a role of national importance in policy-making as it was the focus of the government review conducted by Sir Michael Pitt in 2008. This led the research to explore the models of policy windows and windows of opportunity and then to use the large amount of interview data to test whether these theories, which had previously used national level case studies, held true at the local level.

Charmaz (1995, 2002) described a number of features common to all studies using grounded theory which were specifically identified within the methodology of this thesis:

- creation of analytic codes and categories developed from data and not by pre-existing conceptualisations (theoretical sensitivity)
- inductive construction of abstract categories
- theoretical sampling to refine categories
- writing analytical memos as the stage between coding and writing
- the integration of categories into a theoretical framework.

As the interview data was collected, full, detailed transcripts for every interview were produced (see Figure 3-2), meanwhile detailed notes were taken to record the researcher's informal observations during other periods of engagement with the flood risk policy-making process such as attending meetings (see Figure 3-3).

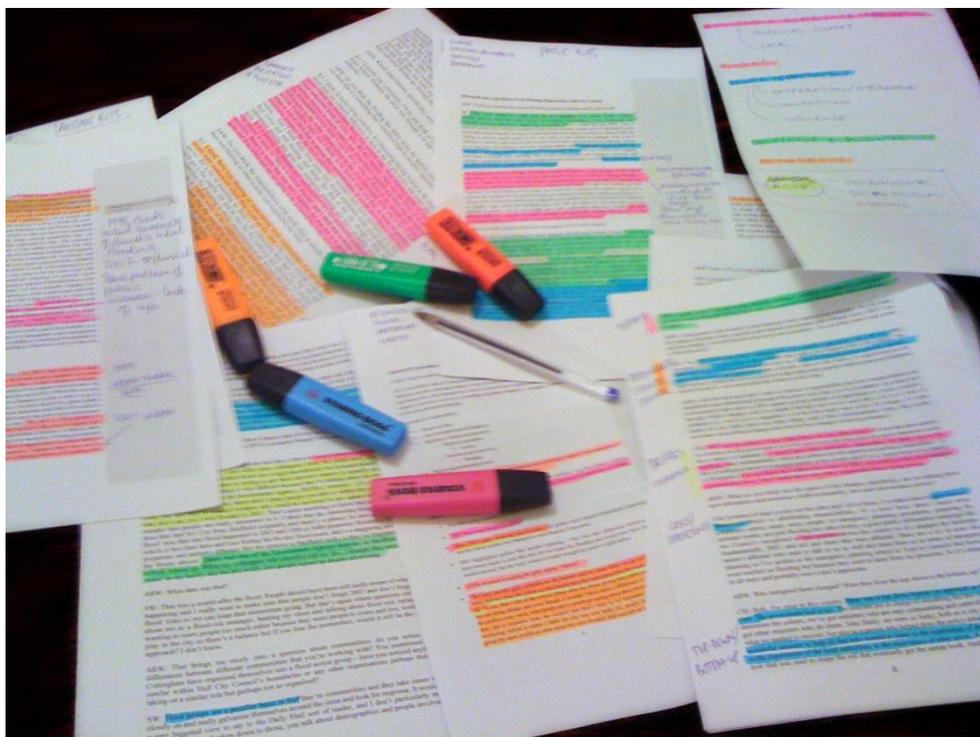


Figure 3-2: Photo of several coded and categorised interview transcripts

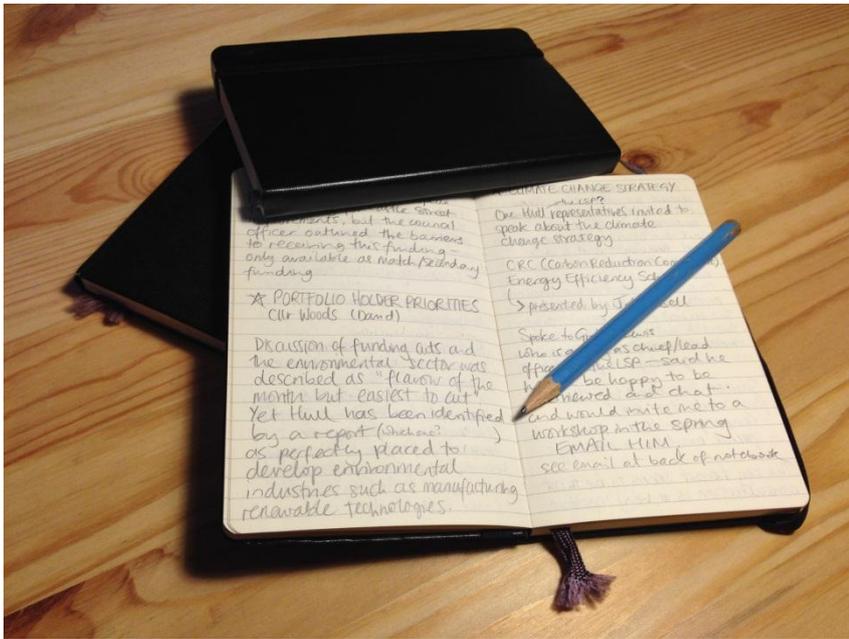


Figure 3-3 Photograph of notebooks used to record observational data

Both of these data recording methods allowed the researcher to be fully immersed and engaged with the content and analytic codes and categories began to emerge naturally from the data. The first stage of developing these codes consisted of highlighting one of the interview transcripts and noting key messages in the margins, as shown in Figure 3-4.

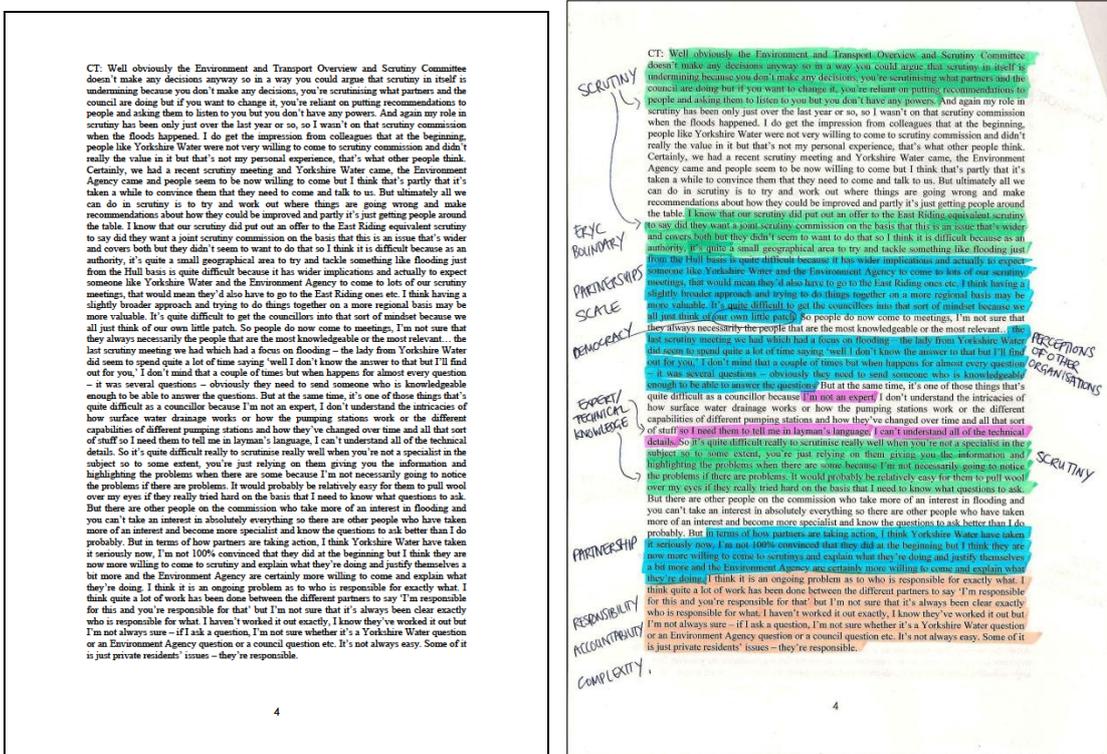


Figure 3-4: Example page of interview transcript data before and after coding and categorisation

After this exercise was complete the remainder of the content of the transcripts was reviewed and five broad overarching themes were identified as shown in Figure 3-5. The remaining transcripts were then coded and categorised according to these themes, which were themselves refined and developed during the course of this process, as the scribbled notes in Figure 3-5 show; for example, the category “power” became “power and partnership” and an extra category, initially called “changes” and then “drivers” (referring to “drivers of change”) was added.

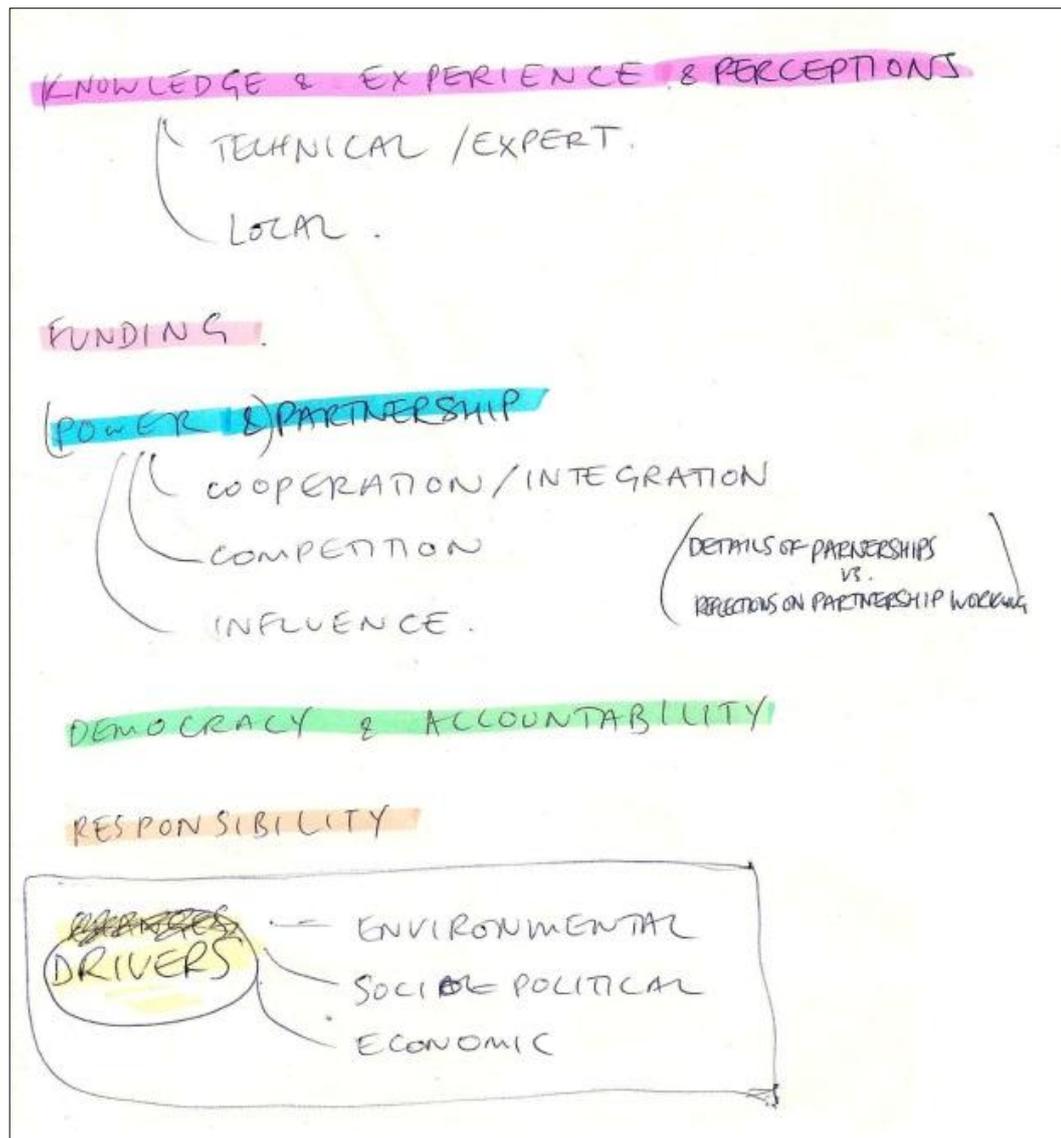


Figure 3-5 Early notes on categories emerging from the data

The six broad analytical categories were ultimately distilled into the three themes which formed the foundation for the empirical chapters of this thesis: environmental crisis as a policy driver, democratic engagement with flood risk and the development of flood knowledge. The flexible nature of the grounded theory methodological approach means

that there “probably as many versions of grounded theory as there are grounded theorists” (Dey 1999: 2).

3.4 ACCESS TO INFORMATION

Access to information held by government has become much more free and open since the Freedom of Information Act 2000, which gives the public the right to ask any public sector organisation for all the recorded information they have on any subject. As a result far more data has been released into the public domain. However, when it comes to making sense of this data, many problems remain. For example, during the course of this research attempts were made to collated data on the financial expenditure on flood risk management and how this had changed over time. However, the complexities of the funding arrangements as shown in Table 3-1 Funding streams available for flood risk management made this almost impossible. There are two key areas of spending on flood risk management: investment in infrastructure (known as capital expenditure), and expenditure on staffing and management (known as revenue spending).

Table 3-1 Funding streams available for flood risk management

Funding Stream	Funding Body	Summary	Geographical area of Expenditure
Flood Defence Grant-In-Aid	Defra / EA	Large sums potentially available for all types of flood risk management projects (including local flooding, where previously it only covered flood risk from main rivers and coastal).	Catchment level (Hull and Haltemprice catchment)
Regional Flood and Coastal Committee (FRCC) Local Levy	Regional Flood and Coastal Committee	Funding potentially available for all types of locally important FRM projects (including local flooding, where previously it only covered flood risk from main rivers and coastal).	Regional level (Yorkshire and Humber)
Revenue Funding for new Lead Local Flood Authority (LLFA) responsibilities	Defra	Defra funding to support local flood risk management, distributed to LLFAs via Local Services Support Grant and managed internally by local authorities (not ring-fenced).	Local Authority level (Hull City Council Unitary Authority)
Local Authority Formula Grant	National Government	Local Authority's main funding stream is from national government through what is known as the Formula Grant.	Local Authority level (Hull City Council Unitary Authority)
Council Tax (including Levies and Precepts)	Council tax payers within the local authority boundary	Council tax is a large source of revenue for local authorities and can be spent on flood risk, but it is subject to a high number of demands from all departments of the local authority. Levies and precepts are short term local level funding streams which must be	Local Authority level (Hull City Council Unitary Authority)

		sanction by a local referendum. They are most effectively mobilised in the aftermath of a flooding event when public support for increased local spending is stronger.	
European Union Funding	European Union	Many different funding streams	Various
Defra One-off Grants and Pilot Projects	Defra	Funding available to support one-off projects as needed or pilot projects which may prove useful in developing new national policy e.g. Flood Resilience Community Pathfinder	Various
Developer Based Contributions (S106/CIL)	Local property developers	Funding stream which can be accessed for projects which specifically address an issue arising as a result of a new development.	Housing development level
Non-Government Organisations (NGOs) and Charitable Trusts	Non-Government Organisations (NGOs) and Charitable Trusts	e.g. The Canal and River Trust, who have recently taken over the work of the government-run British Waterways to maintain the 3,000 miles of canals across the country.	Various

Many of these funding streams are distributed across different geographical spaces, for example funding for flood defence infrastructure drawn down through the Regional Flood and Coastal Committee is spent at the regional level, whereas local authority expenditure on flood risk activities such as emergency planning is confined to local authority boundaries. This creates difficulties for flood risk management authorities as flood water does not respect these political and administrative boundaries.

As a result of the highly complex funding arrangement of various different flood risk management activities across a variety of different areas meant that it proved impossible to compile a figure for total spending on flood risk management in Hull.

3.4.1 RELATIONSHIP WITH CASE PARTNER

This ESRC CASE PhD studentship was conducted with support from Hull City Council. The industrial supervisor at Hull City Council was the City Planning Manager, who was a dynamic and enthusiastic person with good working relationships with a number of different departments within the council. A good working relationship was developed with the CASE partner (Planning Department, Hull City Council) for this project which facilitated enhanced access to information and interviewees. Hull City Council offered resources such as policy documents and local statistics which provided a useful starting point for the desk study. But, perhaps, of more interest in methodological reflection is the effect of this relationship to the research. The partnership with the council gave easier access to information from the council, such as the Surface Water Management Plan before normal publication. Furthermore, as a result of the links with the council, it was easy to gain access to a number of council meetings and some interviewees made it clear that they felt more comfortable and able to speak more freely as a result of having developed some rapport in advance and having a shared understanding of some of the issues in question. One interviewee inferred that as an “inside” job, this research was worthy of their more private opinions than they would perhaps not offer up to another researcher who would be considered an *outsider*. There were also other contexts in which the partnership with the council affected the research. For example, interviewees stated that the “official” status given to the research by the council’s backing validated requests for interviews which they often ignore. However, despite the numerous advantages outlined, there was also occasionally a sense that some interviewees may have been holding back for exactly the same reasons; namely that the researcher was considered an insider at the local authority rather than their own organisation. Whilst it was stressed that the relationship did not affect the academic integrity of the project, some interviewees may still have felt the weight of the connection. For example, when

interviewing Yorkshire Water, the representative was very careful not to say anything that might compromise the company on release of the research findings.

3.5 RESEARCH METHODS IN OTHER STUDIES

Within the environmental governance literature there is a wide acceptance that it is advantageous to combine a variety of research methods (Denzin and Lincoln, 2003). The inherent interdisciplinarity of environmental research such as this, means that studies which take a mixed method approach allow the issues to be approached from a range of angles and therefore a wider array of results to be reported. Quantitative methods such as surveys give results which can infer patterns and trends, but these methods do not give a feel for the experiences and processes which can be gained from qualitative methods from which one can construct a “perception of reality” that is “subjective, constructed, multiple and diverse” (Sarantakos, 2005: pg 41).

The methods used in other studies in similar fields are considered in Table 3-2.

Table 3-2 Methods used by other researchers on similar topics in chronological order

Author	Year of publication	Title	Qualitative methods	Quantitative methods
Priest	2003	Responding to flood risk in the UK: a strategic reappraisal	Policy analysis Interviews	
MacGillivray	2006	Benchmarking risk management practice within the water utility sector	Risk management capability maturity model	
Borne	2006	Sustainable development: the reflexive governance of risk	Ethnography Interviews	Questionnaires
Penning-Rowsell <i>et al.</i>	2006	Signals from pre-crisis discourse Lessons from UK flooding for global environmental policy change	Policy analysis Interviews	
Butler	2008	Flooding as a Form of Risk	Semi-structured interviews Document analysis Observation	
Venton	2008	Methods of enhancing the sustainability and scale of community based disaster risk management	Semi-structured interviews Participant observation	Questionnaires

Porter	2010	The Extreme Flood Outline - Co-Producing Flood Risk Mapping and Spatial Planning in England	Semi-structured interviews Policy analysis	
Walker <i>et al.</i>	2011	Assembling the flood: producing spaces of bad water in the city of Hull.	Ethnographic diaries Interviews	

The trend that is identifiable in Table 3-2 shows that over the past 15 years there is a tendency to use mixed methods to triangulate data and strengthen theories and findings. Some researchers used a mix of qualitative and quantitative data and those who used only one or the other still used a mixture of approaches within that category. This study uses qualitative methods, namely interviews and textual analysis, and also some quantitative data in the form of a short, informal, face-to-face social survey. The reason for this is that the required data is best captured in a way that is less formal, with a less rigid structure in order to allow issues that arise during the course of data collection to be pursued.

3.6 RESEARCH METHODS IN PRACTICE

The aim of this research is to examine crisis as a driver of flood policy. The crisis that has been examined in this thesis is the 2007 flood event in Hull and the changes in policy and practice which emerged over the course of this research in 2009-10. Such changes would have been impossible to observe and analyse fully at this time using only documentary analysis as it was only in late 2010 that there was a change in legislation and therefore in order to realise the aims of this study interview and observational data was used. This provided the insights needed to analyse changes in governance that were still only in their infancy and not yet visible in the written form.

This study takes a case study approach, examining the detailed workings of the flood risk governance system at the local level in Hull, but in the context of the national framework in which it operates. Case study research focuses “on a particular event, decision, institution, location, issue or piece of legislation” (King et al. 1994, p. 4). Case studies are useful if we understand them not as an isolated example but as embedded within the national picture and a way of teasing out the details and variations at the local level which can sometimes be obscured in national level analysis.

The case study of Hull in this research is not simply the geographical boundary of the study, but it is also part of the research strategy (George and Bennett, 2005). The idea of

using the case study approach as part of the empirical inquiry was to keep the necessary contextual detail within which the research was taking place. The “detailed consideration of contextual factors is extremely difficult to do in statistical studies, but is common in case studies” (George and Bennett, 2005 p.19).

Case study research is not confined to one form of data collection but instead often combines several types of data and the most successful case study research demonstrates the triangulation of different sources (Fiss, 2009). The detailed study of the city of Hull and all its processes and politics drew upon policy analysis, interviews and participant observation to build up a fuller picture.

Detailed, qualitative case study research is particularly important in exploratory research as unexpected data can be captured (George and Bennett, 2005). For example, during interviewing if the researcher asks a participant “were you thinking X when you did Y,” and the participant answers “No, I was thinking Z”, if the researcher had no previously considered Z to be causally significant this may not have been uncovered using other research strategies (George and Bennett, 2005 p. 20). This research uses a mixed methodology to build up a fuller picture of the issue and the contextual background from the perspective of a range of informants from organisations including Local Authorities (Officers and Members), Environment Agency, Water Company, Voluntary Organisations and Tenants and Residents Associations.

Initially a desk review of the concepts was carried out, the results of which are expressed in the literature review chapter and allowed key debates to be identified in the literature which formed the basis for the research. In the second stage of the research, observation was used to scope out issues within Hull City Council by talking to employees and attending meetings in order to gain a better understanding of the organisational and legislative framework. This allowed key subject areas to be identified, which were then pursued in the main phase of interviewing. Thirty-one semi-structured face-to-face interviews were conducted between March 2010 and February 2011 to explore different stakeholders’ perceptions of flood risk in Hull.

The research questions were addressed as follows:

Did a post-disaster policy window open in 2007?

An approach backed by historical literature was used to examine the political, social, economic, cultural and environmental backgrounds which were revealed through the use of interview questioning. The arrangements for modern flood risk management were teased out from modern policy document analysis and during both observation and in more detail during the interviews. The role of crisis in precipitating changes in the system was explored during the interviews.

How do the public participate in flood governance?

Observation and interview data were used to reflect upon public accountability of flood governance before and after the 2007 floods. The capacity of the system to respond to public engagement was analysed primarily using data from the in-depth interviews and observation. Interviews also provided some insights into the degree to which those involved in flood governance felt the system was working. The effect of changing roles and responsibilities was considered during the observation.

How is knowledge about flooding generated?

The interviews revealed a degree of contestation with regards to different forms of knowledge, which was then pursued in the main study through the in-depth interviews and observation. Reflections were drawn upon stakeholders' perceptions of one another and the effects of uncertainty and risk on decision-making and policy were also considered.

3.6.1 POLICY ANALYSIS

The policy focus of this research required the analysis of secondary sources, such as government policy statements, to be used in conjunction with other types of data. For the modern textual analysis, a variety of literature was used including professional documents obtained from contacts at Kingston-upon-Hull City Council as well as those available online to the general public. These included government white papers, bills and reports as well as local authority strategic planning, review and investigative documents such as the Surface Water Management Plan (2009). Historical government documents and descriptive accounts of flooding and flood policy found in books and online were used to explore the historical background to the study. This study of policy documents

gave a clearer picture of the specifics of policies, than that which was generated by interviews which was sometimes contradictory.

3.6.1.1 DEVELOPMENT OF NEW FLOOD AND WATER POLICY DURING THE COURSE OF THIS RESEARCH

This PhD research was prompted by the flooding in Hull in 2007 and uses this event to re-examine the theory of “policy windows” at the local and national levels. It documents many of the changes that took place in the following years, the most important of which in government policy terms was the Flood and Water Management Act 2010. The Act progressed from conception to enactment over the same period as this research, as shown in Figure 3-6. This meant that policy change was in the forefront of many participants’ minds during interviewing, which was advantageous in that it made the topic seem relevant and interesting to the interviewees, but at the same time since new policy had not yet been agreed it made it very difficult to assess the reliability of statements made during the interviews.

The Flood and Water Management Act was an important change in the policy landscape in which this research was carried out as it represented a shift in understandings of flooding; it was the first mention in policy of pluvial flooding and it was the first time the role of local authorities had been formally recognised as flood risk authorities.

This PhD research was undertaken very much within the landscape of policy change and policy-making. As Lasswell (1971: pg 1) stated: “Policy analysis is the activity of creating knowledge of and in the policy-making process”. Flood risk management practices were in flux, one interviewee summed this up when they said:

“I define my life in terms of what came before the floods and what has gone since the floods.” (Senior Local Council Officer LAO 7, Emergency Planning Department, 2010 p. 17: interview)

This subject and indeed this quote will be discussed in detail in the empirical chapters of this research.

PROGRESS OF
FLOOD AND WATER
MANAGEMENT ACT 2010

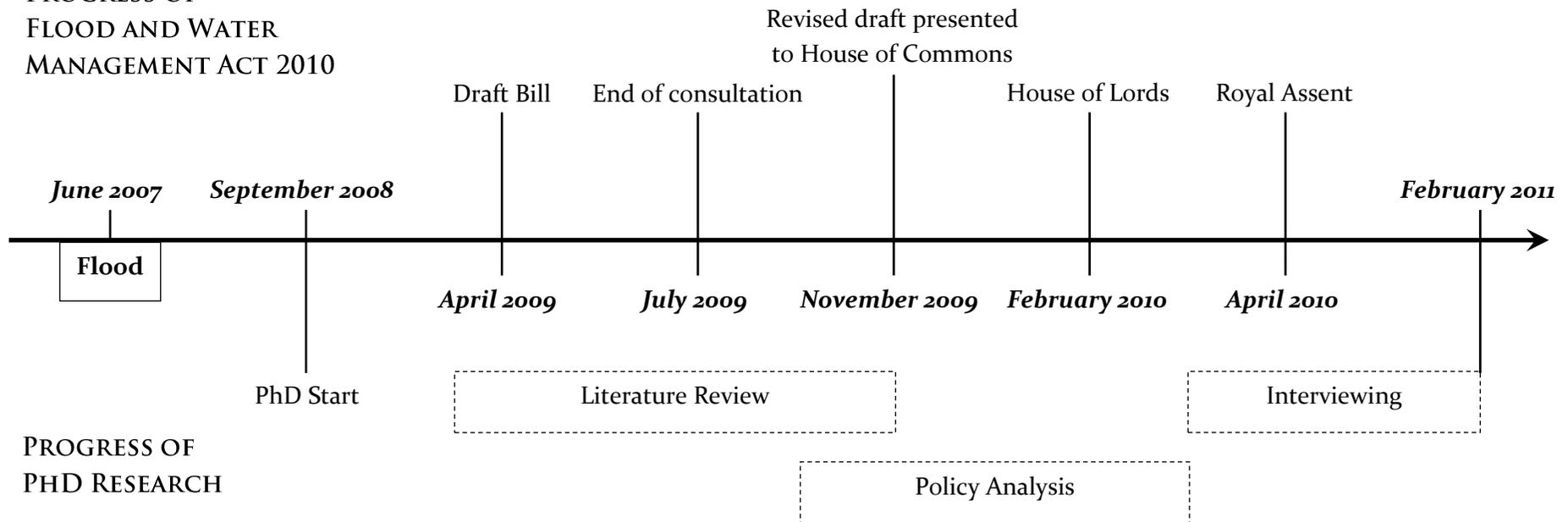


Figure 3-6 Progress of PhD research compared with development of Flood and Water Management Act

3.6.2 OBSERVATION

Personal observations are not commonly included in the research of public policy, but as Denscombe (2003) asserts, perhaps the key reason for this is the difficulties of accessing the organisations involved in the process. However, being an ESRC CASE PhD in association with Hull City Council, presented the opportunity for access to the Council in order to undertake observations. There are several levels of public meetings that are conducted by the Council; ward, area and full council meetings (which cover all subjects), as well as meetings of the Overview and Scrutiny Commissions (which focus on specific subjects). As part of this research a number of these meetings were attended in 2009 and 2010. The most useful and relevant were the monthly meetings of the Environment and Transport Overview and Scrutiny Commission. According to Hull City Council,

“the following services, functions and issues fall within the remit of this Commission:

StreetScene, Climate Change, Flood Risk Planning & Management, Waste Management, Sustainable Transport, Highways, Public Transport, Waterways, Green and Open Space, Bio-Diversity” (Hull City Council website, 2012: pg 1)

17 meetings were attended in total, between May 2009 and December 2010 and of these, flooding explicitly featured on the agenda in 7 of the meetings and flooding was the sole focus of two of the meetings. Attending these meetings presented the opportunity to meet council officers and councillors who were most involved in the process of flood risk management and observe their roles and responsibilities, whilst also creating the space in which to build some rapport and trust with people who would later become interviewees for this research. Having the chance to observe the system of local flood governance in advance of undertaking the interviews was key to making a reasonable assessment of any bias and/or mis-information generated in the interview data.

Area Committee Meetings in the following areas were attended: West – 7/7/10, Riverside – 14/7/10, Wyke – 21/7/10, Northern – 1/3/10, East – 23/6/10, Park – 23/6/10. Four Ward Meetings in Newland (large parts of which had been flooded in 2007) were also attended in the summer of 2010, around the three year anniversary of the 2007 floods, which featured in the meetings. The area and ward committee meetings were useful for making contact with people involved with local level flood risk management in the city and also understanding the detail of how the public engaged with the Council’s system of public scrutiny.

One of the primary criticisms of participant observation is the bias that can be introduced by the bias as the method relies on the personal notes and interpretations made by the individual researcher (May, 2001). However, Williams (2003) asserts that observation can be more impartial than other types of data collection because it does not impose hypotheses and research schedules, but rather is driven by the activities being observed.

3.6.3 IN-DEPTH INTERVIEWS

Flood governance is multi-disciplinary and in order to address this complexity it draws on expertise and knowledge from a number of different fields in order to address the various aspects of policy and practice of flood mitigation, adaptation and emergency planning and response. Interviewing such a wide range of professionals was challenging as each interview could vary so much; from the interviewee's basic parlance, each using very different terminologies, through to fundamental differences in approaches to problem-solving, politics and openness. This proved difficult in this study, methodologically, due to the requirement for the researcher to develop a level of expertise in each area that was sufficient to conduct content rich interviews.

3.6.3.1 INTERVIEW CONTENT

Semi-structured interviews were used within a flexible framework of core topics to be explored according to the knowledge of the interviewee. The core topics remained fixed throughout the course of the data collection and an interview agenda was drawn up to ensure that the data collected covered the same subjects and was therefore comparable. Themes were presented in a neutral way to minimise bias whilst still eliciting the information required (Bryman, 2004). The interview guides used can be found in Appendix B and C.

Flooding, an excess of water, is an inherently complex social issue; water by its very nature is fluid and dynamic, making it hard to delineate the boundaries of its stimuli and influence. This research began in the aftermath of a flood event in Hull and it may have seemed sensible to begin to explore the issues by interviewing those who were flooded, but it quickly became apparent that the effects of the event had had much wider repercussions. For example, one of the participants in this study who was interviewed as a result of his involvement in a flood action group was motivated more by the effects of flooding that he observed in his community than on his own property. This demonstrates just one of the difficulties in assessing flood governance issues where choosing the sample population is not necessarily immediately obvious. More

commonly, participants in the study who were interviewed were representatives of community groups who had been flooded in 2007. Many of the same topics were discussed with local residents as had been discussed with local officials, but despite the similarity of the content, there were big variations in other aspects of the interviews such as the language used by the interviewees. The water company representative and government officials used the most technical language of all the participants, but members of the flood action group also used a lot too, whereas local councillors and members of tenants and residents associations tended to use more commonly used terminology.

Key issues surrounding public engagement in flood risk and the emergence of the concept of adaptation were used to provide a basis for the interviews. Interviewees were encouraged to reflect upon their personal experiences and draw upon the projects they had worked on to back up their opinions. The interviews focussed not only on the way that adaptation strategies are being used now, but also where the concept arose from and where they envisaged it going. The variety of institutions that were interviewed gave an interesting range of responses from those with conceptual policy ideas to those with very practical experiences.

3.6.3.2 SAMPLING

After some time spent researching the institutional arrangements of flood governance in Hull, a list of the organisations involved was drawn up, as shown in Figure 3-7.

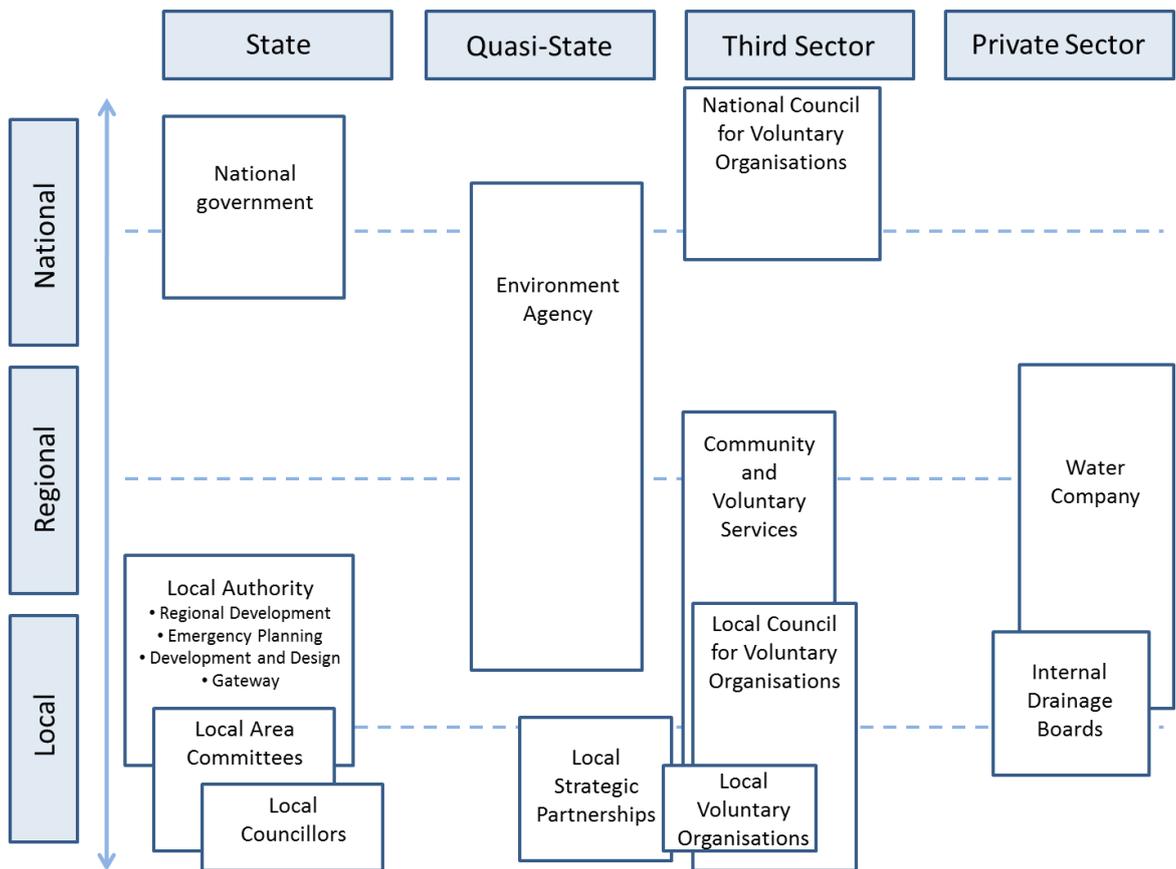


Figure 3-7 Diagram showing institutional framework of flood governance in England in 2007

Using this as a guide, individuals were contacted from each of the organisations involved with flood policy and practice at the local level, in the city of Hull. The local nature of the study seemed to make it easier to access the desired interviewees as they often knew one another. The link through the CASE scholarship arrangement to the City Planning Manager at Hull City Council was a springboard for the first research interview as well as personal introductions to further individuals involved with flood governance.

Furthermore, this association with the Council enabled access to documents that were not in the public domain such as the minutes from the Multi-Agency Flood Forum (Interview with Council Officer, LAO1, 2010) and from the attendance list on these minutes, the names of those involved with discussions on flooding at the local level could be identified which helped to generate further candidates for interviewing. One of the difficulties with this, however, was that there were rarely contact or even organisational details associated with the names.

Much of the literature on research methods is directed to use various sampling strategies - systematic, stratified, random, snowball or simply convenience sampling, each with advantages and disadvantages in different situations. However, the reality of research such as this is that the population is too small to use the sampling methods mentioned

and therefore a purposive sampling framework was chosen to select interviewees on the basis of their involvement in flood risk management in Hull. There were some organisations that were indispensable to the study as they were key players in the flood governance system with a duty to oversee surface water flood risk in Hull and these organisations were approached first. Following this, further interviewees were selected based on their involvement with local decision-making as evidenced by their presence and comments at flood risk strategy meetings such as the Regional Flood Defence Committee and the Integrated Strategic Drainage Partnership or involvement in writing local policy such as Hull's Surface Water Management Plan and Strategic Flood Risk Assessment. The aim of this research was to assess the situation before and after 2007 therefore in the case that an interviewee had come into their post after the 2007 floods, further interviews were carried out with colleagues who were in post before 2007 as well.

To summarise, interviews were conducted with people from the following organisations⁹:

- Hull City Council Officers
 - Regional Development (5)
 - Development and Design (2)
 - Strategy, Equalities and Partnerships (1)
 - Area Committee Manager (1)
- Hull City Council Members
 - Environment and Transport Overview and Scrutiny (5)
 - Leader of Council (1)
 - Environment Portfolio Holder (1)
- Emergency Planning (2)
- Local Strategic Partnership (2)
- Environment Agency
 - Regional (1)
 - Local (1)
- East Riding of Yorkshire Council Officers
 - Planning (2)
- East Riding of Yorkshire Members
 - Deputy Leader of the Council (1)
- Yorkshire Regional Flood Defence Committee (1)
- Yorkshire Water (1)

⁹ Some interviewees appear in more than one category. See Appendix E for interview participant codes.

- Single-issue Action Groups
 - Cottingham Flood Action Group (4 formal interviews plus group discussions)
- Residents and Tenants Associations
 - STAR “Supporting Tenants' and Residents' Associations” (1)
 - Avenues Residents Association (1 formal interview plus group discussions)
- Non-specific Voluntary Organisations
 - North Bank Forum (1)

In order to gain a better understanding of the way in which the local authority and local people interacted with one another, several groups were considered and invited to interview; local councillors presented themselves as good interview candidates as they had regular contact with the people they represented as per their democratic duties. There were also interest groups which took various forms: flood action groups, local authority supported residents' associations, and independent residents' groups, however, the number of active groups in existence was much lower than anticipated. During this investigation there was one community group who were observed as being active at a large number of different flooding discussions across the Humberside area; the Cottingham Flood Action Group. The Group based in one of the villages on the outskirts of Hull took off in the aftermath of 2007 flooding and quickly raised its profile amongst local authorities and other organisations involved in flood risk management. The group became aware of this research and were self-selected as active members of the flood risk governance across the North Humberside region, despite their local affiliation with the village of Cottingham. The possibility of comparing and contrasting the activities of this group to those of a similar group within the city of Hull's local authority boundaries was explored. However, it became apparent that no such group existed and in fact in Hull people interacted with the system in different ways, through their local councillors, MPs, the local media and indeed local residents associations, rather than through issue based action groups. As a result of this, third sector groups such as the North Bank Forum and STAR (Supporting Tenants' and Residents' Associations) were also approached for in-depth interviewing as a way of gauging public opinion and analysing the motivations and pathways to engagement of those involved. Finally, as a result of the early interviews which exposed the blurring of citizen's influence across the local authority boundary and the importance of the relationship between Hull City Council and the neighbouring authority, East Riding of Yorkshire Council officers and members were included in the

study in order to gain a more balanced insight into the issues arising from the local authority boundary transecting the drainage catchment area.

3.6.3.3 *CONDUCTING THE INTERVIEWS*

Interviewees were contacted both by email and by telephone prior to the appointment in order to establish good rapport and to provide written and verbal information on the aims and purposes of the research and the interview procedure (Bloor *et al.*, 2001). An example of the letter inviting interviewees to participate in this research can be found in Appendix A. Efforts were made to try to reduce the potential for respondents to feel uncomfortable by adopting a fairly casual interviewing style and by avoiding specificity of information (Iosifides, 2003). All interviews were inevitably affected by the interviewer and the interview environment. For example, distractions in the interview environment on occasion caused people to lose their train of thought. A database of research contacts and interviewees was kept to help organise the research process by listing people who agreed to participate, those who did not want to be involved and those who needed to be followed up. In order to avoid disrupting the flow by note-taking, interviews were recorded using a digital dictaphone and then transcribed afterwards. All interviewees were accommodating and allowed the interviews to be recorded. A full statement of consent which outlined how data was collected and used, written in accordance with the University Of Hull Statement Of Ethical Practice, was signed by each participant. The interview consent form can be found in Appendix D. Issues of access, rights of veto over publication and use of material and levels of anonymity were clarified with research participants before research commenced.

Interviews were used instead of questionnaires in an effort to tap into people's inner deliberations and stream of consciousness rather than simply eliciting bald, face-value answers (Burgess, 1984). The interviewing style that employed was as open as possible without compromising comparability, in order to encourage the interviewee to speak freely on the subjects needed for this study. Each participant was assured of the confidentiality of their responses. If participants wanted, they could opt out of being recorded, but the situation did not arise. Furthermore, interviewees were reassured that if they felt uncomfortable at any point, interviewing would cease, but the occasion never arose. Participants were also informed that they could request a copy of the research findings if they chose. The departmental ethics form was completed and approval from the ethics committee was obtained before research commenced.

3.6.3.4 *HOW MANY INTERVIEWS IS “ENOUGH”?*

The perennial question facing researchers using qualitative interviews as their primary source of information is how many interviews should be conducted (Baker and Edwards, 2012). It is very difficult to give any useful indications of what this figure may be as qualitative interviews vary a great deal. There are minimum requirements of the data in order for the research to be robust, but the interviews may vary not only in length but also breadth and depth of exploration of the topic. Bryman (2012) gives a good overview of this issue and cites one study which suggests 20-30 interviews as a good number of interviews (Warren, 2002 in Bryman, 2012) and another which states 60 as a minimum and 150 as a maximum (Gerson and Horowitz, 2002 in Bryman, 2012) which are evidently very different guidelines. It is therefore no surprise to find that this issue causes great anguish for PhD students. The majority of studies discussed by Bryman (2012) and Baker and Edwards (2012) indicate that 20-30 qualitative interviews is average for a PhD in social sciences in the UK. Despite there being no definitive answers, there are some things to consider when trying to judge whether enough interviews have been conducted. The style of the study will give some indication of how many interviews are needed. A deep study which followed an individual's life experiences from birth to death would be able to go into great detail and the analysis would be completely different from another study which took a broad range of opinions on a particular subject using shorter interviews but with a larger sample size. There are however a lot of studies, such as this one, which are somewhere in between. In this research the number of interviews that should be conducted was not immediately obvious. The strategy that was therefore employed was to first attempt to interview at least one individual from each organisation involved in flood governance at the local level and then to stop interviewing the point at which there are no new insights being generated by each additional interview being undertaken (Glaser and Strauss, 1967).

3.7 CONCLUSION

The study of flooding is inherently trans-disciplinary, this has been reflected in the project proposal, the composition of the supervisors of this PhD and finally in the substance of this research. The thesis explores the multi-dimensional issues around flooding and flood risk which transcend traditional disciplinary boundaries and therefore require a range of methods to encompass the broad spectrum of issues being addressed. Interviews were used in conjunction with policy analysis and observational data to give a comprehensive and balanced overview of the historical context and current complex arrangements. Overall the flexible methodological approach to the research provided the

space for avenues of interest and new interview participants to be pursued as the research developed. This proved very effective as there were other aspects which proved too difficult to achieve. For example, more interviews with other departments of the water company may have provided further insights, but as a private company, their priority was not to give time for research and obtaining further interviews with them proved unsuccessful. This chapter covered the philosophical issues surrounding the generation of data for this study and the qualitative methods used. The research methods, policy analysis and interviews, used in conjunction with one another provide different insights; the policy analysis indicates the institutional understandings of flood risk, while individual insights are provided by the interviews. This combination of sources will be used in the empirical chapters which follow to explore and contextualise the way in which flood governance policy and practices change.

4 THE ROLE OF FLOODING AS AN ENVIRONMENTAL CRISIS

4.1 INTRODUCTION

Policy changes for a number of reasons. A change of administration or national mood, a new issue arising that needs attention, a particular problem becoming more urgent, or a crisis (Solecki and Michaels, 1994). This thesis focuses on this final driver of policy change – crisis, and, in particular, examines the role of environmental crises. The research questions for this chapter are: did a post-disaster policy window open in 2007? If so, were any flood-related policies implemented? And what aspect of flooding did they focus on? Using empirical data this chapter gives a genealogy of changes in flood risk and the associated policy landscape in Hull in order to critique the application of the environmental crisis model in the context of Hull, a local case study. The final section deconstructs the notion of environmental crisis as a driver of changes in policy, mapping out the flood events and examining whether there is a link to rapid national policy change which drives changes at the local level. As described in the literature review chapter, there has been some examination of these issues at the national level, but this study will go on to explore whether there are alternative stories at the local level which contradict the national picture. The overlap and parallel findings in data from a number of case studies is what allows us to generalise and find patterns across the national picture, but by the same token there is almost always some deviation from the national picture in each local study resulting from the variations in the conditions at the local level (Eisenhardt, 1989).

The nature of flooding, a risk that transcends political and administrative boundaries, means that strategic flood governance is thought to operate best at a catchment level (HR Wallingford *et al.*, 2001). However, as discussed in the literature review, in 1956 sewerage and drainage was undertaken at the local level by 2,423 organisations in a piecemeal fashion and therefore the 1961 local drainage board reforms attempted to coordinate efforts from the national level (Ofwat and Defra, 2006).

There is a great deal of legislation affecting flood risk in England and Wales and in order to reassess the validity of the theory of flood policy windows locally as well as nationally,

the case study of Hull will be used. Therefore it is important to consider each law or act in turn and trace through the changes that have occurred alongside this in the city of Hull. Table 4-1 gives an overview of the major legislation pertaining to flood risk. It is also important to note that there are many policies that had a profound impact on flood risk, but did not quite make it to legislation. For example, Planning Policy Guidance 25 in 2001 and then Planning Policy Statement 25 in 2006 which prohibited building in the floodplain in England were major changes to the way things had been done before. We will return to this in more detail in due course.

Legislation, by its very nature is well documented and preserved and therefore the complete historical record of flood related acts can be set out as follows.

Table 4-1 Legislation relating to flood risk in England and Wales 1861-present

Date	Legislation
1861	Land Drainage Act
1918	Land Drainage Act
1926	Land Drainage Act
1930	Land Drainage Act
1937	Agriculture Act, Section 15
1947	Town and Country Planning Act
1948	River Boards Act
1958	Drainage Rates Act
1961	Land Drainage Act
1962	Land Drainage Act
1963	Land Drainage Act
1963	Water Resources Act
1968	Agriculture (Misc. Provisions) Act
1970	Agriculture Act, Part V
1972	Thames Barrier and Flood Protection Act
1973	Water Act, Sections 5, 9, 19
1976	Land Drainage Act
1976	Land Drainage (Amendment) Act
1981	Wildlife and Countryside Act
1983	Water Act
1989	Water Act

1990	Environmental Protection Act
1991	Land Drainage Act
1994	Land Drainage Act
1995	Environment Act
2010	Flood and Water Management Act

As the table indicates, flooding was initially subsumed within land drainage in the first half of the twentieth century, but underwent a shift around the middle of the century towards flood defence and public protection, before finally moving into an era of risk management with the 2010 Flood and Water Management Act (Penning-Rowsell *et al.*, 1986). This reflects the changing conceptualisations of flooding through this period; at first it was a symptom of agricultural drained land, but as settlement in floodplains became more widespread the focus shifted to urban protection as over time it became clear that defence would not be sustainable in the long run and therefore a system based on risk management has become the norm (*ibid.*).

Data on flood events is more piecemeal; various documents are available from record offices, public libraries with newspaper archives and comprehensive documentation most widely available from the turn of the twentieth century. This study is particularly concerned with recent changes in flooding up to and around 2007. Therefore, the changes in flood governance that took place in the twentieth century are key to building up a fuller picture of the institutional arrangements and historical path of transformation. Exceptional flood events of national importance are detailed in Table 4-2 below. It is important to note that more localised or less destructive flooding has occurred frequently throughout historical and modern times which may also forms part of the complex public perceptions of flooding.

Table 4-2: Flood Events of National Importance since 1900

Date	Brief Description
1928	“Flood Week” January 6-7 th the River Thames overtopped, killing 14 people and flooding thousands of homes in north-east London (Harland and Harland, 1980)
1947	The Great Flood 18 th March. Rain and snowmelt combined producing huge volumes of water, which flooded thousands of properties and approximately 690,000 acres of farmland (Tunstall <i>et al.</i> , 2004).
1953	East Coast Floods 31 st January. A North Sea storm surge inundated much of the

	Essex, Suffolk, Norfolk and Lincolnshire coasts, over 300 people died and it was declared the greatest peace time disaster (Waverley Report, 1954)
1968	Summer River Floods. Sustained heavy rainfall across South East England led to flooding that affected over 14,000 properties (Environment Agency, 2008b).
1978	East Coast 12 th and 13 th January. Large parts of east coast inundated by tidal flooding, with many thousands of properties affected (Steers <i>et al.</i> , 1979)
1998	Easter Floods 8 th and 9 th April. Very intense rainfall causes high levels of surface runoff in eastern Wales and central England flooding over 4,200 properties (Met Office, 1998)
2000	Autumn Floods October and November. Heavy rainfall caused fluvial floods affecting over 10,000 properties at over 700 sites (Met Office, 2000a, 2000b)
2004	Boscastle 16 th August. Heavy rainfall caused flash floods in which 58 properties flooded (Met Office, 2004)
2005	Carlisle 8 th January. Heavy rainfall and the consequent surface water runoff caused 1,800 properties to flood and five people died (Met Office, 2005)
2007	Summer Floods June and July. The worst flooding occurred on 25 th June across Yorkshire, with over 10,000 properties affected by surface water flooding in Hull and approximately 2,200 properties were affected by extreme levels of surface runoff in Sheffield. Flooding also occurred in July across central England but on a much smaller scale (Hull City Council, 2009; Environment Agency, 2007). It was described as the largest peacetime emergency since World War Two in Parliament (Parliament UK, 2010).
2009	Cumbria 18 th and 19 th November. Exceptionally prolonged and heavy rainfall led to severe flooding across parts of the Lake District. Many rivers in the Lake District exceeded their previous maximum flows by a wide margin (Met Office, 2009)
2010	Cornwall 16 th and 17 th November. Heavy rain - 40 mm or more in 2 hours in some places - caused flooding in parts of Cornwall (Met Office, 2010).
2012	25 th November. Extended rainfall brings flooding in parts of Southwest and Western England as well as Yorkshire and the Midlands (Guardian, 2012b).

As discussed in the Literature Review (Chapter 2), crisis events may open up “windows of opportunity” for policy change (Kingdon, 1984). The suggestion is that an extraordinary event raises the issue up the public agenda and therefore the political agenda, which can provide the right socio-political conditions for a change in policy. In a paper by Penning-Rowsell *et al.* (2006), it is suggested that major flood events created “policy windows” in

which major changes were enacted; the floods in 1947 and 1953 provided the space for a shift from land drainage to flood defence and then the 1998 and 2000 floods created the environment in which government policy could change again, this time to a flood risk management approach. This chapter will explore these three paradigms of land drainage, flood defence and flood risk management, firstly with reference to the national picture, then in terms of the specific case study site of Hull with the aim of determining whether environmental crises facilitate changes in flood governance and whether Hull conforms to the national picture.

4.2 LAND DRAINAGE

Land drainage was first introduced to England and Wales by the Romans, but their systems deteriorated when they left and it was not until c.1640 when windmills were used to pump water along a chosen path that drainage became really reliable (Beauchamp, 1987). Windmills were superseded by steam engines around 1820 and by 1940 pumps were powered by internal combustion engines or electric motors (Beauchamp, 1987). Though not in use any longer, many windmill towers can still be seen across East Yorkshire (Gregory, 1985).

The history of national flood governance in England and Wales, from which the current system has recognisably grown, began with the first issue of the Land Drainage Acts in 1861. Whilst there had previously been various pieces of legislation¹⁰ that governed the drainage of land and sewerage, the 1861 Land Drainage Act marked the beginning of an era characterised by national attempts to coordinate large scale drainage and land creation. At first the system was piecemeal and varied a great deal across the national picture. The Land Drainage Acts of 1918 and 1926 began to homogenise the variations and this continued with a report by a Royal Commission that was ordered in 1927. The occurrence of “Flood Week” in January 1928 (Harland and Harland, 1980) during the course of the writing of the report gave extra credence to the motivations for action and the result was the Land Drainage Act 1930 which is widely considered to be the first comprehensive piece of legislation pertaining to flood risk (Penning-Rowsell *et al.*, 1986). The Act consolidated all previous legislation and reorganised the existing arrangements by setting up an official system managed by Internal Drainage Boards with formalised

¹⁰ Commissioners for sewers were given powers with authority from the Crown in 1258, 1427 and 1531 to unite responsibility and control of land drainage and sewerage under one authority, however local levies were difficult to collect (with land owners arguing that the cost of defence exceeded the value of the land) meaning that they had little capacity to enact national policy (Owen, 2011).

national policy on land drainage levies and management strategies led by the Ministry of Agriculture and Fisheries (Land Drainage Act 1930). The Land Drainage Act 1930 also confirmed the role of Local Authorities in the future of flood governance by giving them control of “non-main” watercourses. It is important to note that the powers of the Internal Drainage Boards never were and are still not mandatory, only permissive.

When the Ministry of Agriculture and Fisheries was set up in 1889 (originally named the Board of Agriculture), it had a very different *raison d'être*, namely agricultural land management, which included further draining and defence of land. Powers transferred to the Board of Agriculture upon commissioning in 1889 were:

*“those of the Land Commission under the Acts relating to tithes, copyholds, enclosures, commons, allotments, **land drainage, improvement of lands, university and college estates, glebelands and agricultural holdings**” (Board of Agriculture Act, 1889, my emphasis)*

The reduction of flood risk for other land users protected by the flood defences was a happy coincidence rather than a departmental aim. By this logic, the Ministry did not require and therefore possess any powers or responsibilities over other aspects of flooding such as flood warning or development control. The reason agriculture was prioritised in this way was driven by the UK’s pursuit of food self-sufficiency during and after the First World War which had fallen to its lowest recorded levels as shown in Table 4-3 below (Defra, 2006a). High levels of food imports from British colonies overseas had created a situation in which the UK had very low food self-sufficiency (Maynard, 2008). This exposed it to significant risk of food shortages.

Table 4-3: Approximate British food self-sufficiency over different periods (Defra, 2006a: pg 16)

Pre 1750	Around 100%
1750-1830s	Around 90-100%
1870s	Around 60%
1914	Around 40%
1930s	30-40%
1950s	40-50%
1980s	60-70%
2000s	60%

In 1917 a Food Production Department was established by the Board of Agriculture to increase domestic agricultural production (Dewey, 1980). This was achieved in part by improving the drainage of agricultural land which had fallen into a “decayed state” (Sheail, 2002: pg 254). Prisoners of war undertook the works and 400,000 acres of farmland in England and Wales were improved (ibid).

In the inter-war period, the Board of Agriculture pursued land drainage in the face of opposition from land owners by promoting it as a method of tackling unemployment, by widening the definition of beneficiaries which improved the cost-benefit analysis, and by subsidising the Internal Drainage Boards to relieve the financial strain on landowners (Bowers, 1998). Effectively,

“the cost of preventing flooding and draining land was transferred from the affected landowners to the nation as a whole.” (Scrase and Sheate 2005: pg 113)

This represented a fundamental shift in the model of flood management from private individuals to the state, who retain responsibility to the current day.

The focus of efforts at this time was on “arterial drains” (large rivers) which were made straighter, wider and deeper in order to relay water away from fields more quickly and efficiently (Bowers, 1998).

As Table 4-3 shows, the UK was still heavily reliant on imports of food and therefore when the Second World War broke out, there were more nationwide food shortages. A retrospective government report explained;

“The chief reason why the war-time shortage of food was so acute was the dependence of the United Kingdom on imports for more than half its food supplies; up to 1939 over half the meat, nearly all the fats, four-fifths of the sugar, and some nine-tenths of the cereals and flour were imported.” (Ministry of Food, 1946: pg 5).

Food security became critical when the Germans blockaded British ports (Scrase and Sheate 2005). Government efforts to reduce demand through food rationing (Ross, 2007) and increase domestic food production were noticeable and

“by 1944 there was, by comparison with the pre-war production, a 90 per cent increase in the production of wheat, an 87 per cent increase in potatoes, and a 45 per cent increase in vegetables.” (Ministry of Food, 1946: pg 5).

Expansion of agricultural production through field drainage became more prolific when it attracted specific government subsidisation during the war and then remained high as

a result of the protectionist policies after the war (Bowers, 1998). The British government pursued a policy of self-sufficiency in food production not only due to the difficulties of importing food during the World Wars, but also afterwards due to decolonisation post 1945 which reduced the potential for foreign imports of food (Maynard, 2008).

4.2.1 THE GREAT FLOOD OF 1947

Food supplies did not recover instantly and rationing continued for nine years after the war was over (Ross, 2007). Post war-time food shortages were further exacerbated by the extremely harsh winter weather of 1946/7 (Tunstall *et al.*, 2004). It was at this point that the vulnerable population of England and Wales experienced extremely widespread flooding caused by rain melting snow and ice in March 1947, shown on the map in Figure 4-1.

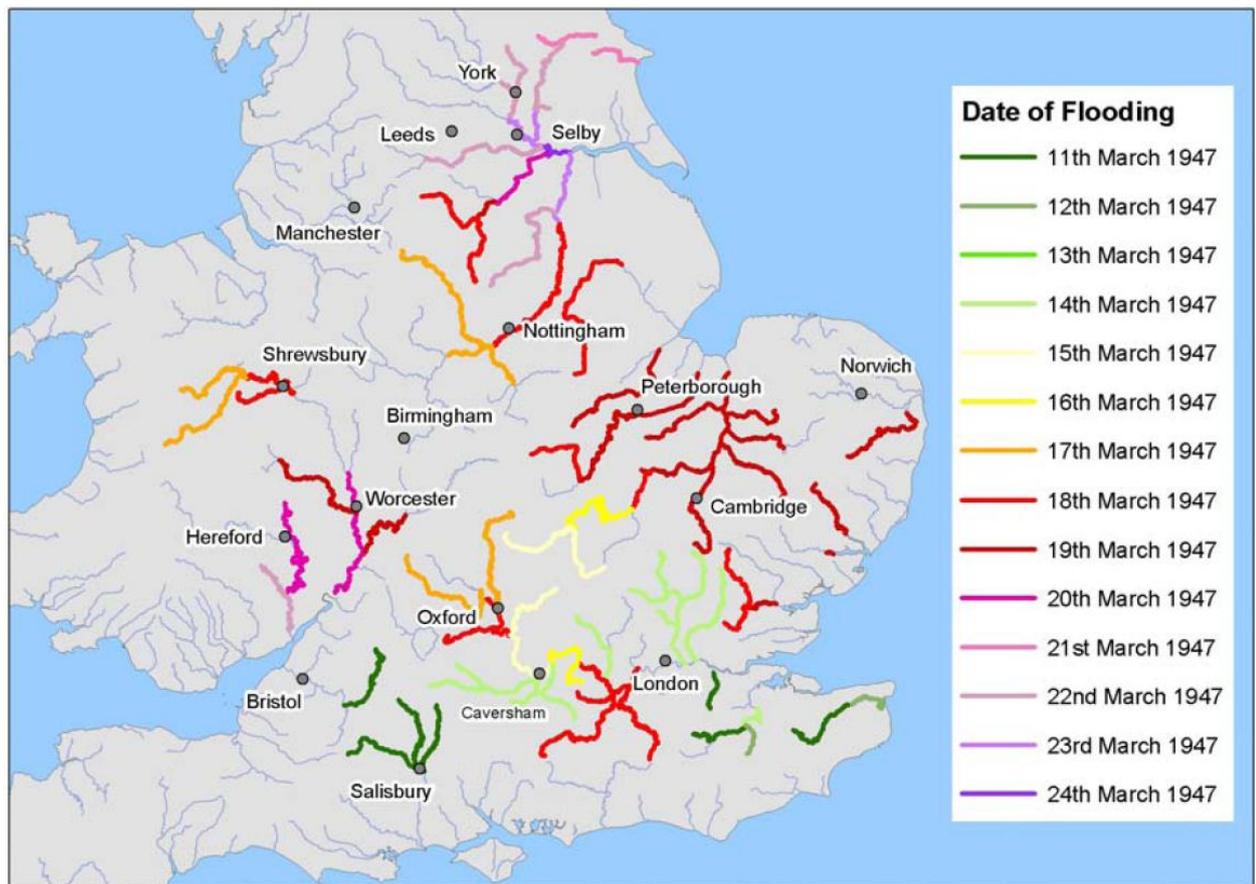


Figure 4-1: Map of major rivers that flooded during the 1947 event with date of first flooding (Risk Management Solutions Inc., 2007: pg 2)

After record breaking levels of snowfall in the winter of 1946/7, a deep spring depression brought heavy rains which thawed the snow and induced floods in which 27,010 properties were flooded across thirty of the forty English counties, 690,000 acres of farmland was under water causing huge crop losses and thousands of people were made

homeless (Barker, 1948; Tunstall *et al.*, 2004; Risk Management Solutions Inc., 2007). These floods were unique because they were greater than any other recorded in history in terms of their volume and persistence and the effects were so widespread and of such enormous magnitude (Barker, 1948: pg 96). In terms of the local impact of this flooding on Hull, the city itself was not flooded, but many places nearby were affected. For example, in the nearby town of Selby 70% of all properties were inundated (Risk Management Solutions Inc., 2007) which may have contributed to Hull's public consciousness of flooding.

The 1947 Agriculture Act, which had been under discussion prior to the floods, received Royal Assent on 6th August with the aim of:

“promoting and maintaining...a stable and efficient agricultural industry capable of producing such part of the nation's food and other agricultural produce as in the national interest it is desirable to produce in the United Kingdom.” (Agriculture Act 1947: pg 1)

Meanwhile as a result of the floods, the government also commissioned a report, called Harvest Home, to investigate what exactly had happened and why (Barker, 1948). The most prominent question raised by the report was over the logic of building in floodplains.

“...floods are natural and beneficial and nature provides washlands to receive those floods. It is only where man has built on those natural washlands that the consequences of floods are damaging. It would usually be far cheaper to pull down the buildings in areas liable to flood and build them elsewhere than to attempt any scheme sufficient to control the river. Such demolition of buildings is at present, of course, out of the question. All that can be done is to ensure that such mistakes are not duplicated in the future.” (Barker, 1948: pg 85)

“This is being done.” The report confidently states.

“Contact is being made throughout the country between the river authorities and the town-and-country-planning authorities to ensure that no more building takes place on land that is bound to be inundated whenever heavy floods occur... they now know just what areas to avoid when building.” (Barker, 1948: pg 85-88)

However, the report's injunctions not to build on the floodplain, were conspicuously ignored by the government, who issued recommendations that agricultural land in the floodplain should be opened up for development to try to meet the desperate need for

housing after the war; the Association of British Insurers estimates that approximately half of all post-war housing has been built in flood risk areas (RMS, 2007). Demand for housing increased after the Second World War as a result of a number of factors including changing social practices and norms (Pampel, 1983), exemplified by an increasing number of divorced and never married people (Michael *et al.*, 1980), medical improvements which led to an increase in the number of elderly people living longer in their homes (Hall *et al.*, 1997) and an increasing propensity to live alone among young people (Wall, 1989). Before 1950, only 3% of the population lived alone, but by 1990 26.8% lived alone (Hall *et al.*, 1997).

4.2.2 1953 EAST COAST FLOODS

The East Coast flood of 1953 was the one of the most dramatic flood events in recent English history, caused by a North Sea storm surge. The floodwaters were described as a type of enemy trying to force its way across the frontline, against which people battled through the night (Steers, 1953).



Figure 4-2: "Flooded areas on east coast, 1953"
 (Steers, 1953: pg 281)

The flood has been described as the "worst natural disaster to befall Britain during the twentieth century" (Baxter, 2005: pg 1293); 307 people drowned, 400 houses were washed away and 32,000 people evacuated (Harland and Harland, 1980; Steers, 1953). Those who were killed, "mainly comprised inhabitants of post-war prefabricated buildings" (Baxter, 2005: pg 1293) who had already suffered homelessness as a result of the war and had

sought safety in new homes, without realising the risks that they faced. A damming journal article written in the aftermath stated very clearly that:

“the nation acting through its central and local government authorities is in a sense responsible, because if houses and towns are built close behind sea walls and at levels which mean that they could be flooded at any high, or even ordinary, spring tide, those houses are in a potentially dangerous position” (Steers, 1953: pg 293).

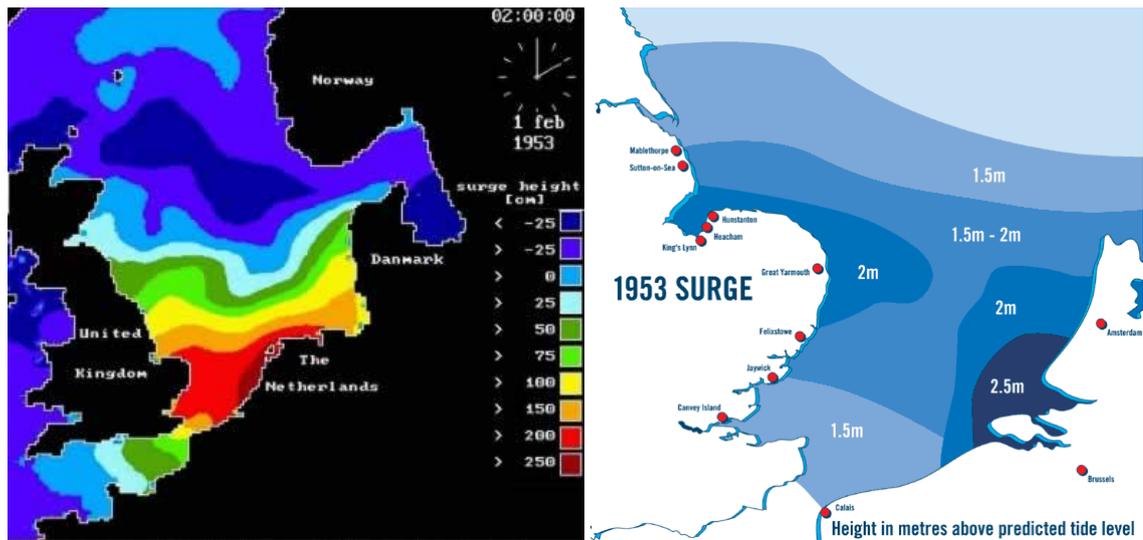


Figure 4-3 Indicative levels of flood water in 1953 North Sea storm surge (Deltawerken, 2006 [left]; Environment Agency, 2008b [right])

This flood event was very important in influencing policy at the national scale which by default impacted on Hull’s local flood policy. However, the combination of existing sea wall defences and the fact that Hull escaped the worst of the storm surge meant that again Hull appears not to have flooded in January 1953. This will be revisited in more detail later in this chapter. The severity of the impact in other areas of England, including many places near Hull, such as Barton on Humber, South Ferriby and Immingham will also have had an impact upon the perception of tidal risk facing the city (Steers et al., 1979).

Perhaps it was the echoes of the Second World War, the pursuit of a post-war welfare agenda or the sheer number of deaths, either way the government response compared to the response to the 1947 flood was more pro-active. London escaped inundation, though only by a small margin, which also brought flood risk to the forefront of the government agenda (Baxter, 2005). After the 1953 flood, Lord Waverley led a committee that

identified three main causes for concern: the lack of an early-warning system, inadequate defences and development in flood plains (Home Office, 1954).

The government undertook work initiating the development of an early warning system for coastal flooding and a national program of defence renewal (Baxter, 2005; Summers, 1978). Flood defences, a number of which were centuries old, were described as “woefully inadequate”, were improved and standardised (Baxter, 2005) and

“by the early 1970s much of the riverine and coastal environment was radically altered by flood defence structures and associated land drainage” (Scrase and Sheate 2005: pg 113).

4.3 URBAN FLOOD DEFENCE

The variation in the government’s response to the two floods is indicative of the fact that whilst environmental crisis and disasters may open up a window of opportunity for policy change, it is not always exploited and in fact there are other factors at work influencing whether it is exploited or not. For example, it may be that after the 1947 flood there were simply other more important government objectives and public demands such as putting an end to rationing and rehousing people that took precedence over flood mitigation (Kynaston, 2007). By 1953 the country had recovered somewhat, rationing had started to be phased out (to be ended completely by 1954) and 1.2 million new homes had been built (Dunleavy, 1981). There was a sense of optimism which may have influenced decision-making and the willingness to invest:

“It was coronation year for the new queen and news, such as the climbing of Mount Everest by a British-led team, also helped to foster a spirit of national optimism.”
(Baxter, 2005: pg 1310)

There is also the potentially cumulative effect of the major 1949 and 1953 floods along with slightly less wide reaching North Sea storm surges in 1938 and 1949 which led to public demand for nationally standardised defences (Harland and Harland, 1980). The 1953 Government’s rhetoric of growth and investment fitted with their pursuit of engineered solutions which effectively consisted of rolling out new or strengthened defences along the length of the East coast.¹¹

¹¹ It took somewhat longer for London to benefit from raised flood defences; the decision was taken in 1972 to build the Thames flood barrier and it became operational in 1982. Baxter (2005) posits that the proposal to defend London was instigated by the 1953 flood, but took a long time for the technical engineered solutions to be worked out. However, the length of time that elapsed

In line with flood defence improvements along much of the rest of the east coast, the flood defences around the Humber Estuary were also raised and have been maintained at least to this level (for example, the city of Hull's Humber defences are maintained to an average of between 1 in 100 to 1 in 200 year standard, but with some localised sections protected to 1 in 20 year) ever since as shown on the map below.



Figure 4-4: Humber flood defences
(Environment Agency, 2008a: pg 13)

The raising of defences after 1953 became embedded in setting up modern flood risk vulnerabilities as it effectively encouraged growth in the areas that had been avoided previously due to high flood risk, locking the residents that moved into those areas into a dependency on those flood defences. This is a prime example of moral hazard or the levee effect, a concept that was introduced in the literature review, which exists when flood defences eliminate residents and investors perception of an area's susceptibility to flood risk, thereby encouraging development on at risk land in floodplains (Smith and Petley, 2009). As Baxter (2005: pg 1309-10) put it:

between the flood event and government announcement makes the causal link less clear cut. There are similarities here with the Tidal barrier which was built in Hull around the same time – this will be revisited in the context of Hull's flood narrative later in the chapter.

“Paradoxically, the strengthened defences may have provided the potential for further human disaster rather than eliminated it”.

And indeed, the potential was realised; “the coastal population has risen by 30–90% since 1953.” (Baxter, 2005: pg 1309-10). This included Hull which underwent significant expansion after the Second World War as shown in Figure 4-5.

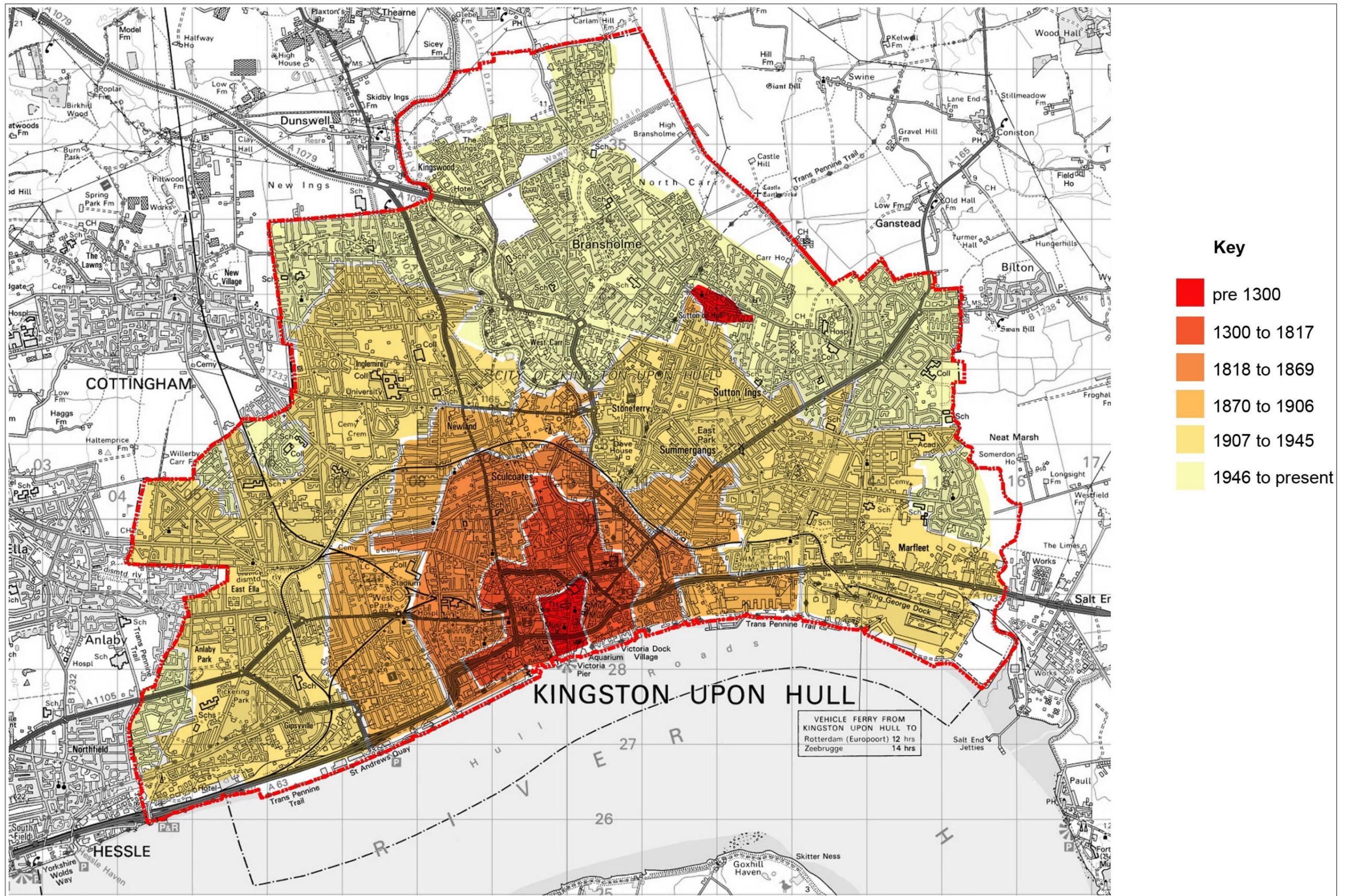


Figure 4-5 Map showing expansion of the city of Hull (using data from Hull City Council, 2011)

Over the course of time defended areas and flood plains became more and more populated as shown in Figure 4-6.

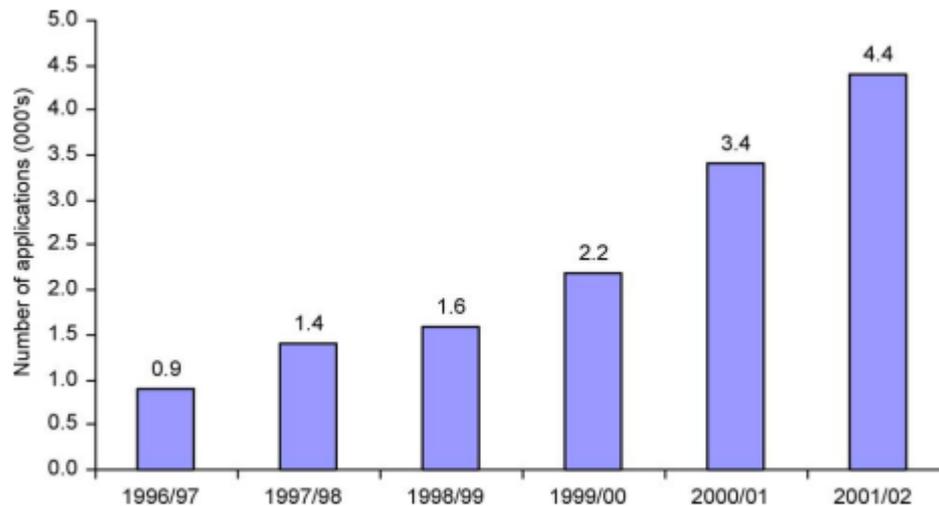


Figure 4-6: Residential and non-residential development applications in floodplains in England and Wales between 1996 and 2002 [financial years]
(Pottier et al., 2005: pg 18)

In 2003 alone, planning permission was granted for over 600 new properties to be built on floodplains against the recommendations of the Environment Agency (Crichton 2005) and in 2009 this problem was still persisting (planningresource.co.uk, 2009).

Despite the increasing potential for risk in the ever increasingly populated defended flood plains, the UK experienced lower than average rainfall in the latter half of the twentieth century (Alexander and Jones, 2001) and there were no nationally significant flood events for many years after 1953. Flood risk management remained within the remit of the Ministry of Agriculture, carried out by the River Boards, followed by River Authorities and subsequently by Water Authorities. Flood defence remained a subsidiary of land drainage (River Boards Act 1948; Water Resources Act 1963; Water Act 1973) and in 1961 was accused of having a distinctly rural bias:

“early last year [1960] the [River] board raised the banks north of Hull at a cost of over £100,000, to save North Hull from flooding. The question which arises here is: why has not similar action, at similar expense, been taken in the centre of the city to save Central and East Hull from flooding, once and for all time? The board's policy appears to be one of protecting unoccupied land, at the expense of the most densely populated areas in the heart of the city.” (Hansard, 1961: pg 1089)

Other research has noted that *“the spirit of the 1947 Agriculture Act underpinned farming and food policy up to Britain's entry into the EC” (Martin, 2000: pg 72).*

People interviewed felt the same, indicating that the link between agriculture and flooding persisted into the 1970s:

“I started with the Water Authority back in the 1970s ... I did quite a lot of rural land drainage schemes which were schemes that were designed to improve agricultural production and in fact the benefits of them were almost exclusively the improvement of gross margin for growing winter wheat or potatoes or things of that sort.”

(Government Agency Regional Manager, GA 1, interview 2010 pg 2)

The link between agriculture and flood defence only began to fade as improvements were made in international relations and trade agreements (such as with the European Community on accession in 1973) which led to increasing food imports and less reliance on domestic food production (Scrase and Sheate, 2005). As the populations of cities grew, so too did the electoral importance of cities and therefore agricultural priorities were naturally replaced by urban priorities (ibid.).

In 1978 there was another storm surge along the East Coast of England and “tidal levels [even] were higher than in 1953” which resulted in more flooding (Steers *et al.*, 1979: pg 194). Despite the higher tide level, it is thought that the impact of 1978 was less than 1953 because sea defences had been improved - reportedly the “damage was relatively slight... as a result of the much stronger masonry sea walls built after the 1953 flood” (ibid). There was no public inquiry or notably linked change in policy or legislation resulting from the 1978 floods.

4.4 FLOOD RISK MANAGEMENT

The publication of *Silent Spring* by Rachel Carson in the early 1960s documented the link between human activity and their impact on the natural environment, specifically the widespread use of DDT, an agricultural insecticide popular after the second world war, (World Health Organization, 1979), and its impact on birds and other wildlife killed by concentrations of such chemicals introduced anthropogenically to the food chain (Carson, 1962). During the 1960s, there was growing concern about pollution and environmental activism drove issues of environmental protection into the public's attention and onto the political agenda (Dunlap, 1997). Fuelled by environmental disasters such as the 1970 oil spill in Santa Barbara Channel in California, widespread unrest culminated in the establishment of environmental pressure groups Friends of the Earth and Greenpeace in 1971 (Friends of the Earth, 2011; Greenpeace, 2008). In 1972, the

first United Nations Conference on the Human Environment (aka the Rio Earth Summit) was held in Stockholm and by 1983, the environmental movement had advanced and the UN General Assembly created the UN World Commission on Environment and Development (United Nations, 1983). The Brundtland report was published in 1987 and introduced the notions of sustainable development and the risks of resource consumption, issues which are still topical today, and the report is considered to form the basis of many policies and directives since (World Commission on Environment and Development, 1987).

These notions of protecting the environment were seen as being incompatible with hard engineered flood defence structures because they often disrupted habitats (Scrase and Sheate, 2005). For example, on the Humber estuary “wetland habitat has been lost to flood defence works” (BBC, 2012a).

In line with Margaret Thatcher’s neoliberal government policy of the time, in 1989, the water industry was privatised (Water Act 1989). The governance arrangements were reworked as responsibility for flooding was transferred from the Water Authorities to the National Rivers Authority.

“I then came to work for the National Rivers Authority when water privatisation took place and from then on, with the National Rivers Authority, there was much more focus on flood risk management.”

(Government Agency Regional Manager, GA 1, interview, 2010 pg 2)

Flooding had transformed from an enemy to be defended against in 1953 (Steers, 1953) into a risk that could be managed. Government subsidies for land drainage ceased in the 1980s and were replaced in 1993 with a broad flood risk reduction mandate (Scrase and Sheate, 2005).

4.4.1 1998 AND 2000 FLOODS

In 1992, there was a formative Earth Summit in Rio which put the idea of human induced global warming onto the policy agenda and formed the basis for current debates and policy on climate change (UN, 1992). Targets were set to reduce emissions levels by an average of five per cent against 1990 levels over the five-year period 2008-2012 (UNFCCC, 1997). An international agreement, the Kyoto Protocol, which committed countries to achieve those targets, was ratified by 37 countries and European Community, including the UK (UNFCCC, 1997). Climate change had secured its place in politics and policy.

From 1998 to 2002, the UK experienced the wettest five year period since 1900 which caused widespread fluvial flooding in both Easter 1998 and again in 2000. On April 9th and 10th 1998, five people died and over 4,200 properties were flooded across the Midlands (Bye and Horner, 1998). In the autumn of 2000, just under 10,000 properties were flooded (Environment Agency, 2001). What had been seen as a five year event began to look like the heralding of a new climate regime associated with global warming with further occurrences of flooding in 2004 (Boscastle) and 2005 (Carlisle) (Defra, 2006a). The 1998 floods were followed by an independent review, known as the Bye Report (Bye and Horner, 1998) and there was an internal report by Defra after the 2000 floods (Defra, 2006a); however the events in 2004 and 2005 passed by without any public inquiry. The 1998 and 2000 flood events were much smaller than the 1947 and 1953 events which triggered government review. This disparity in scale raises the question of what size event is needed to open up the window of opportunity or whether the accumulation of a number of smaller events can have the same effect.

Despite the 1998 flooding being extensive in terms of the national picture, it did not reach much further north than The Wash and consequently Hull escaped inundation. In 2000 Hull again avoided the floods, though this time the effects were felt fairly close by when the River Ouse recorded its highest level since the 1600s (Met Office, 2000). Despite not experiencing these flood events itself, they were important in the flood policy landscape nationally and therefore featured many times in the interviews conducted as part of this study (e.g. Interview GA1, 2010).

The environmental crises presented by the 1998 and 2000 floods have been identified in a study by Penning-Rowsell *et al.* (2006) as catalysts for change, moments in which a window of opportunity opened and policy could be changed. Their assertion is that a new era of flood risk management was ushered in in the aftermath of the flooding. The term “flood risk management” was widely used by interviewees to describe the new activities undertaken during this time period, which is perhaps indicative of an acceptance of a certain level of inevitability associated with flood risk; flooding was no longer a problem to be *solved*, but an issue to be *managed*.

Whilst the interviews conducted as part of this study also suggested that the 1998 floods were important in influencing government policy, they also raised other issues:

“The turning point would have been the Easter floods in 1998 which hit a large part of southern England from Northamptonshire southwards and caused some massive problems in the Home Counties. And of course, once it hits places like that people

get a lot more interested in it and that was probably the watershed; the start of modern flood management.”

(Government Agency Regional Manager, GA 1, interview, 2010 pg 2)

The interviewee here indicates that it was not only the flood that prompted the change, but also the location of the flood event in the wealthier south of England, that opened up the opportunity for change after the flooding.

Whatever the causes, the shift in policy away from hard engineered water management solutions was exemplified by three things; a report published by the Institution of Civil Engineers called *Learning to Live with Rivers*, the Government's Department for Environment, Food and Rural Affairs strategy *Making Space for Water* and finally a move towards development control with the publication of Planning Policy Guidance 25 (PPG25) in 2001 and then Planning Policy Statement 25 (PPS25) in 2006 (ICE, 2001; Defra, 2004; DCLG, 2006). PPS25 aims to appraise flood risk by carrying out flood risk assessments, to manage flood risk by:

“only permitting development in areas of flood risk when there are no reasonably available sites in areas of lower flood risk and benefits of the development outweigh the risks from flooding” (DCLG, 2006: pg 2)

PPS 25 sought to reduce flood risk by keeping land aside for flood prevention schemes, building flood resilience into new properties and using new developments to reduce the whole area's potential flood risk (DCLG, 2006). One of the omissions in this policy is that it focuses on new developments and does not place any flood related restrictions on extensions to existing buildings (Coulthard *et al.*, 2007).

During interviewing, one person asserted a causal link between the 1998 floods and the enactment in policy of the floodplain development restrictions that had been recommended ever since Barker's 1947 flood report.

“That [the 1998 floods] spawned the development of planning guidance; PPG25 the first one followed by PPS25 and the further revision.”

(Government Agency Regional Manager, GA 1, interview, 2010 pg 2)

Finally, with PPG25 and then PPS25, there was a legislative framework to support a reduction in floodplain development. In 2001 PPG25 “recommended” that the Environment Agency be consulted on planning applications in flood risk areas and in 2006 PPS25 changed this to a “requirement”. Yet still in 2007, 20% of projects that the

Environment Agency objected to were granted planning permission regardless of the objection raised (RMS, 2007).

4.4.2 2007 FLOODS

In 2007, there was further flooding that was very serious and geographically extensive, which prompted a huge government response, as one of the interviewees put it:

“1998 started the ball rolling, 2000 was a watershed, 2007 was a whole different ball game”

(Government Agency Regional Manager, GA 1, interview, 2010 pg 5)

The fact that it was very geographically extensive also meant that it was featured a lot in the national media – on television and radio, and in the newspapers. The mass media is the public’s primary source of information on flood risk (Slovic, 1986; Burgess, 2004) and therefore it is likely that this elevated the issue up the public agenda. One interviewee stated very clearly that scale was important in opening up the possibility of change too, saying *“I think the scale of 2007 made a lot of those things really start to come into fruition”* (Interview Council Officer LAO3 2010: pg 2). One interviewee made clear the dramatic impact of the 2007 flooding saying;

“I define my life in terms of what came before the floods and what has gone since the floods” (Senior Local Council Officer LAO 7, Emergency Planning Department, 2010 p. 17: interview).

70% of the properties damaged in 2007 were from pluvial rather than from ‘traditional’ fluvial floods and furthermore, the warning systems that were set up solely for fluvial flooding, so there were no public flood warnings in Hull before the event (Highmore, 2011; Coulthard *et al.*, 2007).

Following the 2007 flood event, there was a public inquiry led by Sir Michael Pitt entitled “Lessons Learned from the 2007 Floods”, the very title of which suggests that changes should be initiated as a result of the flood. Among other things, the report expressed concern over the hyper complex flood governance arrangements as well as declaring that flooding must be of much higher political importance (Pitt, 2008). In response to this, the government promulgated the Flood and Water Management Act 2010 which intended to simplify flood governance arrangements by appointing a Lead Local Flood Authority and designated funding as follows to achieve this and the other recommendations of the Pitt Review:

“Over £60 million will be invested in taking forward the priorities identified in Sir Michael’s report; £34.5 million of funding set aside specifically for the action plan together with a further £27 million of funding identified within other relevant budgets.” (Defra, 2011)

The Flood and Water Management Act 2010 was introduced as the culmination of the pressure on government to produce legislation that specifically covered flooding more holistically arising from the sheer number of occurrences of flood events across the UK in 2007 (not to mention the potential threat increasing as a result of climate change). This supports the argument that environmental crises can precipitate changes in the system of flood governance, but only when the conditions and timing are right for that opportunity to be exploited.

4.5 HULL’S ALTERNATIVE NARRATIVE

The story of the city of Hull has been mentioned in this genealogy of flood policy in England and Wales so far, and this section now turns to the specific narrative of the city of Hull.

Hull has a long history of flooding,

“frequent inundation has been part of the historic record of the east coast of England, from the Humber to the Thames, over the last 1000 years.” (Baxter, 2005: pg 1310)

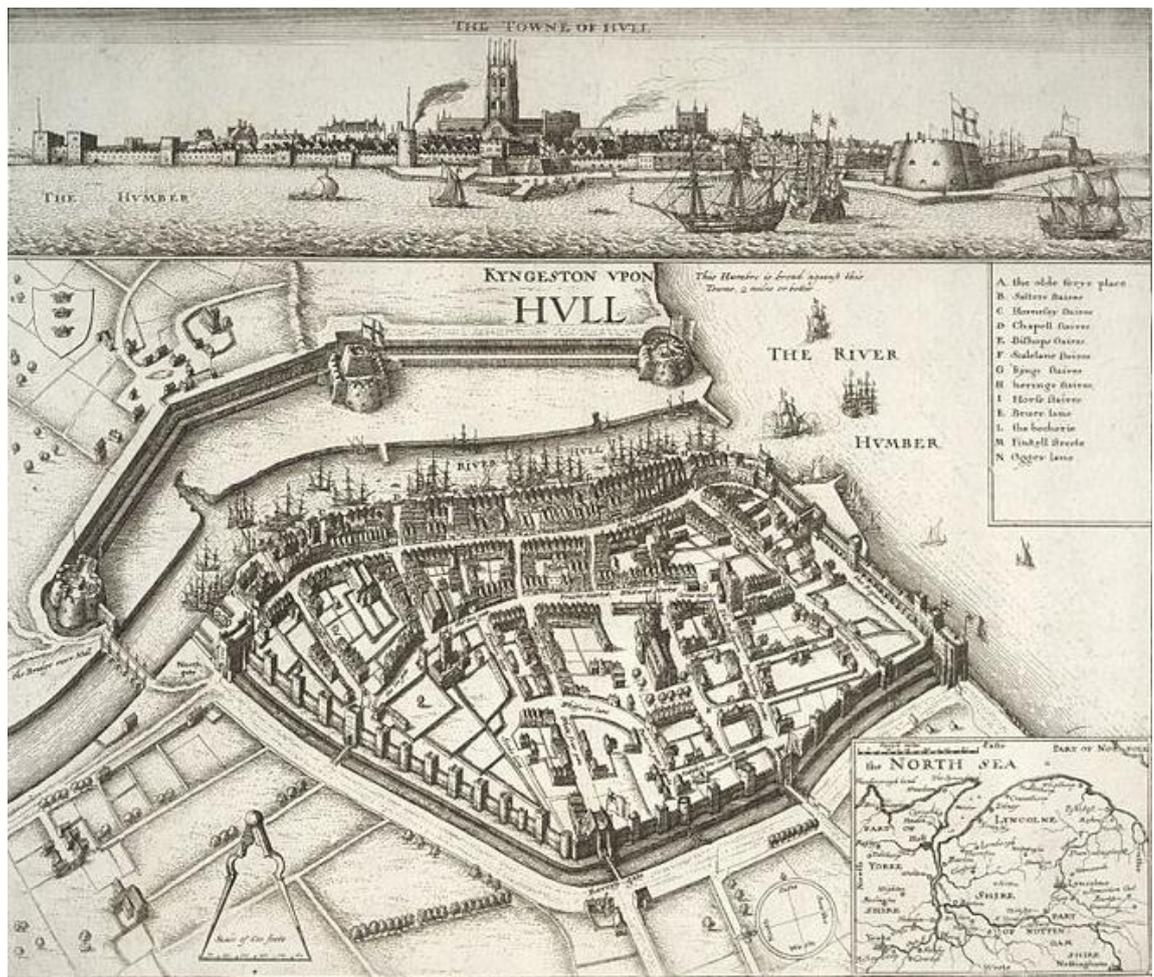


Figure 4-7: Map of Hull in the eighteenth century (Tickell, 1798)

The map shows that in the eighteenth century, defensive walls were built around the city of Hull (Tickell, 1798) and as discussed in the literature review, these may have acted not only as defensive barriers to attack, but perhaps also as early flood barriers (Foreman, 1989). The walls and wharfs were developed as the city changed over the years; in 1847 Victoria Pier was erected which further developed the barriers between the city and the River Humber in particular to protect from tidal flooding (Gillett and MacMahon, 1989).

There was little change to national flood policy in the first half of the twentieth century, but the situation in Hull was somewhat different. There was a flood event on December 17th 1921 (Zong and Tooley, 2003: pg 18), in which the Old Town and Wincolmlee areas were affected in particular (Hull Law Society, 2011) and the local MP of the time was moved to ask the government for aid:

“Lieut.-Commander KENWORTHY (by Private Notice) asked the Minister of Health whether he can render any immediate assistance to the Lord Mayor and Corporation of Kingston-upon-Hull in their efforts to deal with the distress caused

by the flooding of the City on the evening of 17th December?” (Hansard, 1921: pg 404)

Following the flood event, under the Hull Corporation Act of 1925 the local authority took measures to improve flood defences around the city by requiring “*riparian owners to raise their banks to the maximum level prescribed by the Act*” (Hansard, 1961: pg 1088)

This supports the suggestion that a flooding crisis can instigate changes in government policy at the local level as well as the national level. However, as MP Pursey describes in 1961,

“the 1925 Conservative [Hull] Corporation took powers to raise the level of the wharves only to the 1921 high tide level.”(Hansard, 1961: pg 1088)

The authority did not obtain any estimates of potential future flood levels to compare these with the heights of the walls and wharfs they were building (Hansard, 1961: pg 1088). As MP Pursey put it, if it had not been for this “mistake” in the 1925 Act,

“this heartrending problem of house flooding would have been solved for all time” (Hansard, 1961: pg 1088)

However, Hull flooded again as a result of coastal inundation on Oct 10th 1923, Mar 22nd 1928, Sept 24th 1930 and Mar 1st 1936 (Zong and Tooley, 2003: pg 18). No further action was taken in response to these events which calls into question the causal relationship between flooding events and policy change.

In November 1953 there was a further flood event which affected the Wincolmlee area of the city (Hull City Council, 2003a). It should be noted that Hull flooded in 1953, but not in the notorious East Coast Floods which were in January 1953. As previously discussed the development of walls and wharf structures were the likely saviour of the city of Hull in circumstances such as the storm surge of 1953. The map below shows the defences that existed at the time of the January 1953 East Coast Floods.

FLOOD DEFENCES OF THE EAST COAST FROM SPURN HEAD TO DEAL

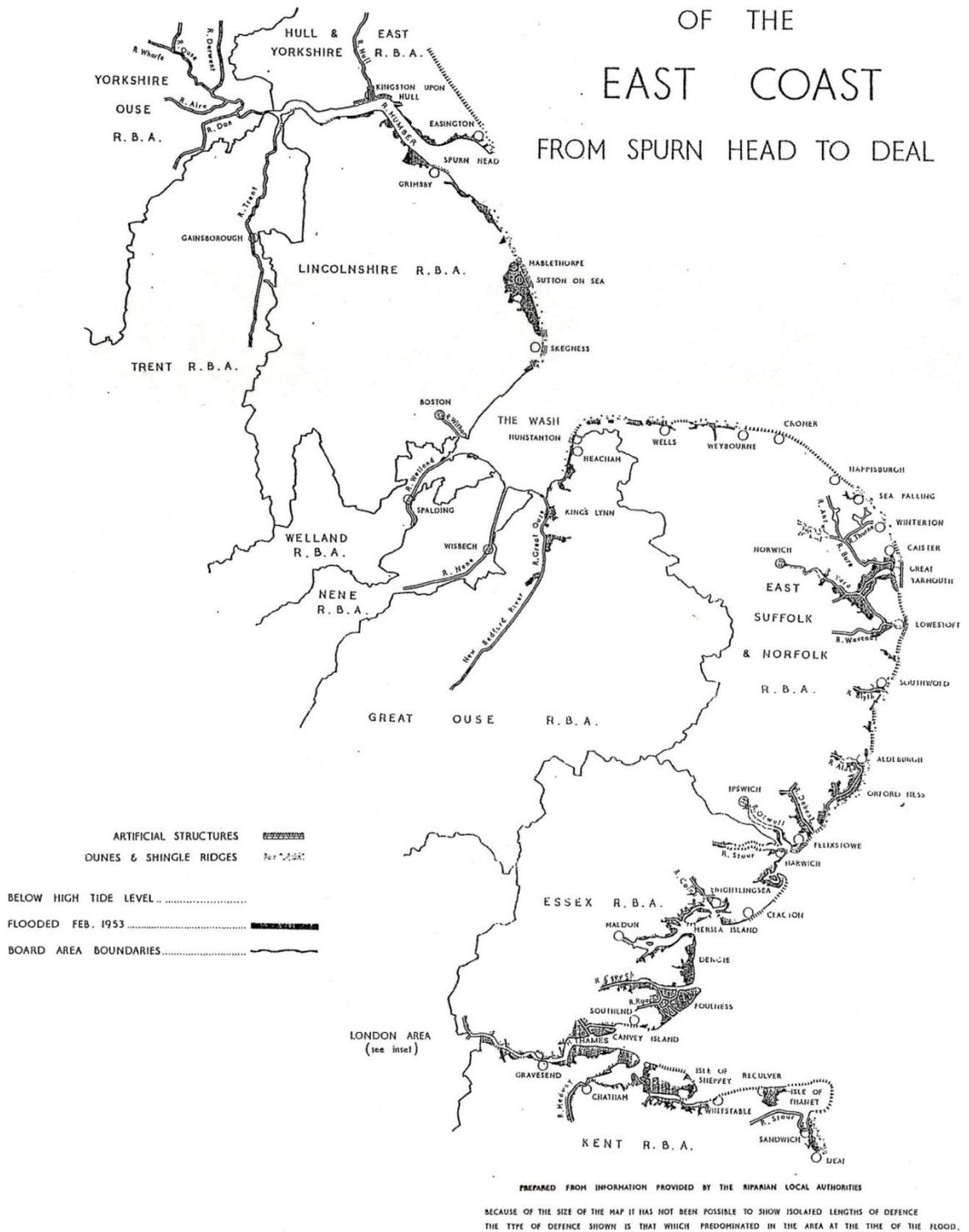


Figure 4-8: East Coast Flood Defences
(Home Office [Waverley Committee Report], 1954)

It is noticeable on this map that Hull appears to be the only place along the east coast with “artificial structures” acting in its defence. Despite this advantage, clearly the city was still at risk of flooding as demonstrated by the flood in November 1953 and

numerous smaller floods documented in newspaper reports¹². In line with the national flood defence agenda, defences on the north bank of the River Humber, around Hull, were again raised:

“since 1953, the River Board has raised and strengthened the earth banks from Wawne to Stoneferry” (Hansard, 1961: pg 1088)

The fact that no action was taken in response to local flood events, but changes were effected locally as a result of nationally important events raises interesting questions over the drivers of local flood policy. This indicates that defences that were built were beyond the financial capacity of the local authority and therefore they relied on national intervention. The local window of opportunity for changes to flood risk management opened up due to political acceptance of the need for change and provided the funding necessary to make those changes.

Further flood events occurred in Hull regularly during large storms and at high tides such as the equinoxes: Nov 11th 1954, Jan 11th 1955 and Dec 30th 1959 (Zong and Tooley, 2003: pg 20). In 1961, MP Pursey describes, the flood risk in Hull:

“The major problem in Hull regarding flooding is that large areas are several feet below high water spring tides and, consequently, at every high tide these areas are wholly dependent for immunity on the banks and wharves being properly maintained at the necessary height and impervious to all over-topping seepage or any other flooding effect.” (Hansard, 1961: pg 1087)

MP Pursey describes the unfolding of events on 20th March, 1961 in a “spring equinoctial high tide” (Hansard, 1961: pg 1087):

“...in the darkness and coldness of eight o'clock at night, the river overtopped long lengths of wharves, seeped through several defective ones and seriously flooded many areas. Four wards out of eight in my constituency were affected and dozens of streets and hundreds of houses were flooded. Water rose to four feet in factories and to three feet in homes. Reports appeared in the local papers with pictures of unfortunate householders "mopping up", but what should have been published was photographs of the defective wharves which caused the flooding.” (Hansard, 1961: pg 1087)

¹² Dates of flood events documented in Hull Daily Mail 1900-2000: March 1933, December 1937, February 1943, September 1946, October 1946, January 1960, July 1973, October 1998, October 1999.

When challenged, the Parliamentary Secretary stated that *“This flooding was the result of exceptional circumstances.”* (Hansard, 1961: pg 1088). However, MP Pursey responded that:

“With my thirty years' naval experience of tides, I maintain that the only exceptional circumstance was that this tide was only three-eighths of an inch above the 1921 tide and so wharf owners have had forty years in which to make good the deficiencies then exposed.” (Hansard, 1961: pg 1088)

Furthermore, parliamentary debates indicate that:

“A comprehensive survey of the banks of the River Hull was begun by the corporation in 1959, a survey such as the hon. and gallant Member has mentioned, but I am informed that this was suspended because of other urgent work.”
(Hansard, 1961: pg 1096)

This indicates the way in which flood risk, despite being a local concern, was not a priority on the national political agenda in 1959, regardless of regular flooding both locally and nationally. This calls into question again the causal link between floods and policy at the time.

There were further smaller and more localised events at the local level that were important in the genealogy of Hull. Most notable was in 1969 when 855 houses adjacent to the River Hull and Holderness Drain flooded in a tidal surge, which is reported to be “the last time the city flooded” in the twentieth century (Hull City Council, 2008; Environment Agency, 2010).

These smaller but repeated flood events shaped the city’s resident’s perceptions and understandings of flood risk. For example, one interviewee described their memory of flooding in the 1960s and 70s:

“there used to be a lot more awareness of it [flooding], a lot of companies in Hull City Centre had little stand-by pumps to pump out their cellars and whatnot. They all had them; they were all aware they had to have them because you expected a flood” (Local Councillor, LAM5, interview, 2010 pg 2)

Despite the fact that Hull appears to have been unaffected by flooding in storm surges in 1976 and 1978, in 1980, with funding from central government, a tidal barrier was erected across the mouth of the River Hull in order to protect the city from tidal flooding from

the Humber Estuary (Environment Agency, 2011). The perception among many residents was that thanks to the River Hull Tidal Barrier flood risk had essentially been eliminated:

“We haven’t had flooding in...(pause) well I can remember flooding when I was an undergraduate which was 1976-1979 but since the tidal surge flood barrier was built which I can’t remember when but I think it was the early 1980s, since then it’s kind of taken a back seat in awareness because it’s stopped floods because everybody’s gone ‘oh yes well that’s the end of that’ so I think we’d all forgotten” (Local Councillor, LAM5, interview 2010 pg 2)

According to the interviews conducted in this study, it was in this environment of assumed safety, without the experience of regular flooding either locally or nationally that the 2007 floods took place. In line with the national picture, 2007 appears to have been the most important flood event in Hull’s recent flood history. The city and surrounding areas experienced heavy rainfall and ensuing pluvial or surface water flooding. This event was important in the genealogy of Hull because it caught both flood governors and residents by surprise and the interviews show that this altered people’s perception and understanding of the area’s vulnerability to flood risk. Even those most directly involved in managing flood risk in the Environment Agency admitted:

“We were blind to the extent of the flooding [in 2007] in Hull because all of our systems are based either on tidal flooding or on the fluvial flooding but mainly associating with backing up from the tidal system.” (Government Agency Regional Manager, GA1, interview, 2010 pg 3)

The Environment Agency’s responsibility is focussed on tidal and fluvial flooding, rather than drainage systems, which gives some idea of why the surface water risk escaped under the radar of flood risk assessment. The causes of the flooding will be revisited in later chapters, but what is important here is that it was a very large, unprecedented and unforeseen event which many interviewees agreed created an opportunity for changes to be made:

“it was quite a good stimulus I think. Had it not happened in 2007 it would have taken I think an event like that to have brought about any change otherwise we would still be carrying on as we had done before then.” (Senior Local Councillor, LAM7, interview, 2010 pg 6)

In the same way as the location of the 1998 floods was important for initiating changes after that flood, one interviewee suggested that it was the location of the floodwaters.

The MPs for Hull at the time of the flooding were seniors parliamentarians John Prescott, who was the Deputy Prime Minister and Alan Johnson, who was the Home Secretary. Furthermore, flooding occurred in the 2010 Coalition prime minister's Oxfordshire constituency and the deputy prime minister's constituency in Sheffield (BBC News, 2007c; BBC News, 2007d). This gave a particular impetus for the government to seize the opportunity:

"I think because we've had so many flooding events in such a short space of time, it's actually quite easy. It would be a lot harder if we hadn't had so many occurrences, so because of 'luck', the [now] Prime Minister's¹³ constituency (Witney, Oxfordshire) was flooded." (Local Councillor, LAM1, interview, 2010 pg 10)

This begins also to introduce the politics of flooding – the suggestion here is that when the prime minister's constituency gets flooded the whole national picture changes and suddenly it becomes much easier to make changes to flood policy at the local level. This was echoed by the experiences of a senior local councillor in Hull:

*"For the government not to be seen to act (leaving aside the moral imperative to act on a series of disasters) it would have been politically catastrophic for them, not to do anything. And fundamentally what puts policies up the agenda are political imperatives – is this of sufficient interest to enough people in the country and if it is, it gets time to be debated in Parliament. I do not think that without the events of 2007, we would not have had changed circumstances **here** [my emphasis]. I don't think there's any other comparable driver in the process." (Senior Local Councillor, LAM 1, interview, 2010 pg 8)*

There was a lot of consensus among the subjects interviewed in this study that environmental pressures are very strong drivers of changes in policy and this fits with a strong literature on the subject, some of which specifically considers the case of flooding in England and Wales (see Penning-Rowsell *et al.*, 2006). However, the interviews also highlighted some issues with the argument. For example, Penning-Rowsell *et al.* argue that the 2000 floods were a catalyst for the development of Planning Policy Guidance 25, but as a quote earlier in this chapter indicated, PPG25 was already under negotiation prior to the 2000 floods.

¹³ The interviewee was referring to the Prime Minister at the time of interviewing, David Cameron. At the time of flooding in 2007, he was Leader of the Conservative Party. Despite this slightly confusing terminology, the point remains that a senior politician's constituency was flooded and then he went on to pursue to the enactment of new legislation when he came into office.

A number of authors have put forward theories that suggest that flood events and the responses to floods are part and parcel of the wider political economy (see for example Scrase and Sheate, 2005). In the case of England and Wales, this is that food production once dominated GDP, which required land drainage and flood defences, but as the importance of food production in relation to GDP dwindled with accession to the EU common market, the erection of physical defences had sanctioned building in floodplains; thousands of homes grew up along these defences, so the focus of defence spending turned to protecting urban areas rather than rural areas due to the property values involved and the political pressure exerted by such vulnerable populations. This alternative narrative was certainly identifiable in a number of interviews; when considering the local case of Hull, interviewees talked about the broader social, political and economic context in which the changes took place before 2007.

“Interviewer: What’s changed since 2007?”

Interviewee: Nothing really.”

(Local Planner, LAO 3, interview, 2010 pg 2)

However, apart from the opinion of this interviewee, there was an almost unanimous consensus among other interviewees that 2007 changed the picture for Hull and beyond with the Flood and Water Management Act 2010. The clearest evidence of change is visible on Hull City Council’s Flood Risk Assessment map which was produced just before the floods in 2007, but only reflected the risks to the city posed by fluvial and tidal flooding (Hull City Council, 2007). After the 2007 flood, the map was revised and many areas of the city had their risk levels upgraded. This is shown in black on the diagram below. The original strategic flood risk assessment maps pre and post 2007 can be found in Appendix F and G.

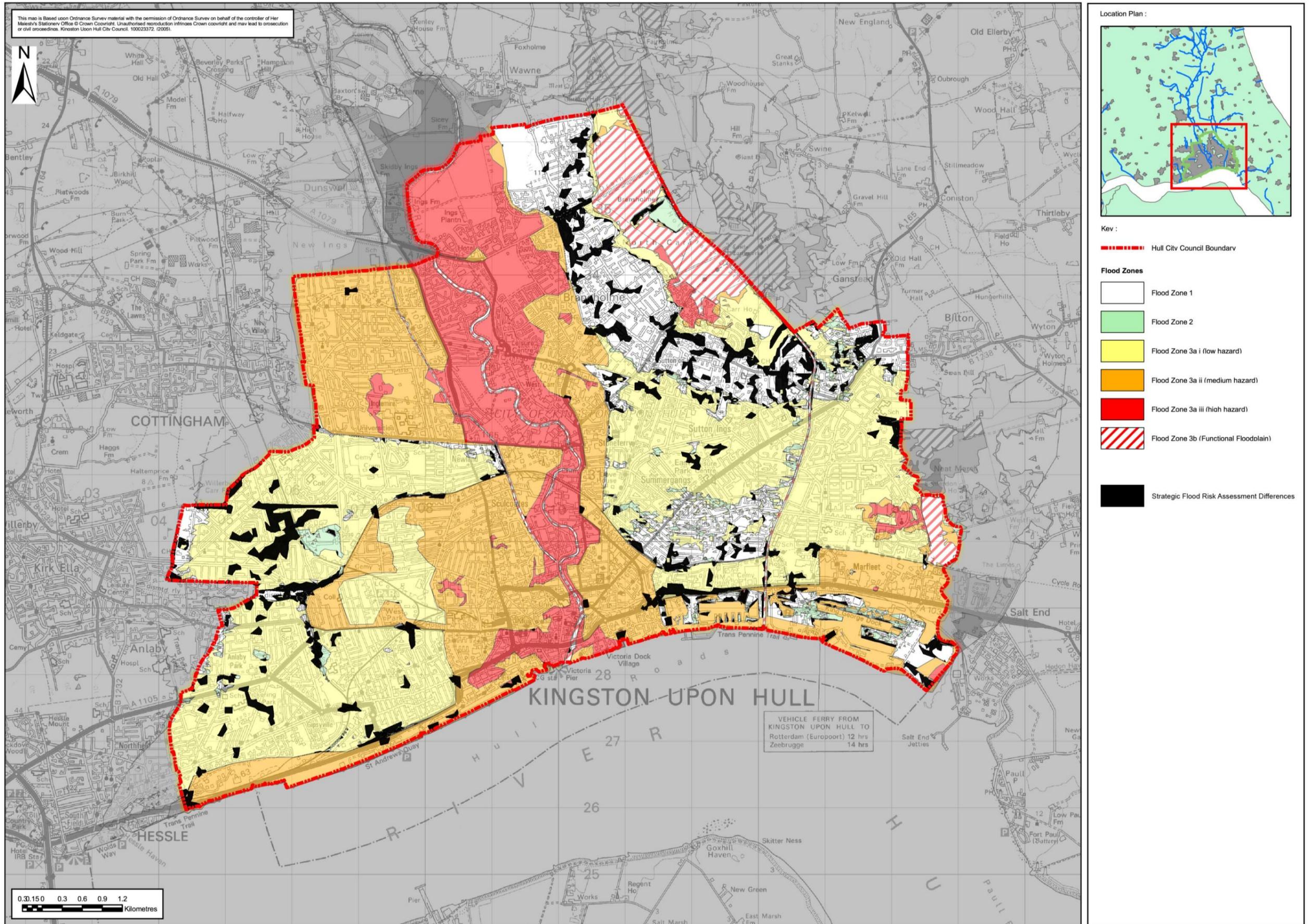


Figure 4-9 Map showing flood zones that have had their level of risk upgraded since 2007 (based on Hull City Council data) See Appendix F and G for the original Strategic Flood Risk Assessments pre and post 2007.

This raises important questions about the way in which extreme environmental events can precipitate or foreclose governance strategies. The advent of a crisis appears to prompt government changes that, due to the nationally driven policy agenda are rolled out across the country and become important in shaping the landscape of local flood governance.

“The East Riding wasn’t affected in 1998 either which I suppose was why the 2007 floods were such a shock really, because the perception [prior to 2007] was that if Hull was at risk of flooding of any sort, it was at risk of tidal flooding rather than pluvial flooding.”

(Government Agency Regional Manager, GA 1, interview, 2010 pg 3)

This quote demonstrates the effects of nationally important floods on the genealogy of local flooding in Hull; the floods in 1998 foreclosed the possibility of a holistic and flexible flood governance strategy because it set in motion policies to deal with that kind of flooding (fluvial), and as a result, the production of flood risk maps showing fluvial hazards. Unfortunately this meant that other kinds of risks, like surface-water flooding, were ignored as the agencies involved concentrated on tidal and fluvial flooding rather than pluvial which then in 2007 showed itself as the product of both institutional complexity and an old (and increasingly pressurised) city’s drainage infrastructure. There are currently no plans to radically overhaul the drainage capacity of the city and building in the city continues in order to try to maintain economic prosperity, which leaves the city of Hull and surrounding area facing a significant and potentially growing risk from pluvial flooding in the future.

4.6 CONCLUSION

Evidence presented in this chapter has been used to analyse changes in flood risk management regimes and reassess the theory of windows of opportunity. In order to understand the modern flood governance system that was in use at the time of the 2007 floods, important events in recent history (the last century or so) that have directly affected the trajectory flood management were examined. These events include floods of national significance in 1947, 1953, 1998, 2000 and 2007 and changes in flood risk regimes from land drainage to urban flood defence to flood risk management, which have been outlined with reference to the political, social and economic circumstances at the time.

The research questions for this chapter were: did a post-disaster policy window open in 2007? If so, were any flood-related policies implemented? And what aspect of flooding

did they focus on? The data shows that a post-disaster window did open at the national level following the 2007 floods and the Flood and Water Management Act 2010 was introduced with heavy influence from the government review into the 2007 floods carried out by Sir Michael Pitt. The 2007 flooding was particularly important nationally as it constituted a new form of risk from pluvial flooding which did not feature at all in the policy rhetoric. This provided the space for a window of opportunity to open up in the aftermath of the flooding which was then driven forward by reports such as the Pitt Review nationally and the Independent Review into the Hull floods. The direct causal link between the magnitude of the 2007 flood and the opening of a policy window cannot be proven as there were a number of other factors in play at the time. The 2007 flood was extensive - it covered large parts of the country, made the national news and therefore was high on the public agenda. Furthermore, the flooding in 2007 occurred in politically prominent places – the constituencies of very senior parliamentarians in the existing parliament and the new one in 2010. The important role that politics and public perceptions of flooding have in influencing the uptake of new policies in the aftermath of a disaster will be addressed in Chapter 5.

As well as being a particularly high magnitude, low frequency event, the 2007 floods were part of a series of floods that have been associated with a new regime of flood risk management which in association with climate change is already on the political agenda (Penning-Rowsell *et al.*, 2006). Government policy to combat the risks of climate change by avoiding building in floodplains (PPG25) was already in place in 2007, which may have also facilitated the implementation of policy changes after 2007. There may have been some changes in motion at the national level before 2007 too, but after 2007 there was a step-change in the way in which this type of flooding was addressed. Having never featured before, a new term, “pluvial” flooding became part of the policy vernacular. It was conceptualised as a new and previously unknown risk which Solecki and Michaels (1994) described as being one of the four conditions which would cause a policy window to open (as mentioned in the literature review). The adoption of a new word and a “new risk” that was addressed by a change in policy, despite the fact that this risk must have existed previously, raises interesting questions about how knowledge about flood risk is generated and flood risk is framed, which will be explored in Chapter 6.

Hull clearly played an important role in opening up the policy window at the local level in 2007 by providing an extreme example of pluvial flood risk in a politically important place, but it also has its own alternative narrative which was explored in this chapter. The case study provided the opportunity to assess whether policy can change at the local

level without any change at the national level. It showed that after a flood in 1921, Hull attracted government funding for specific and finite flood defence improvement works, but when there was flooding in the 1960s, despite MPs petitioning to government there were no further funds offered to the city, which indicates that it is not always possible for local flood managers to change their policies in line with local events if the national climate does not suit it.

National policy windows can open in the aftermath of nationally significant flooding and local policy windows can open after locally significant flooding. However, as flood risk policy is driven from a national level, it can be difficult for local policy windows to be exploited if there is no change happening at the national level as well. It is difficult to enact a national policy change from a localised event that is not representative of national issues, but if a local event is illustrative of national flood risks, then a local event can trigger national level policy change.

5 PUBLIC ENGAGEMENT WITH FLOOD RISK

The previous chapter investigated the extent to which environmental crisis such as flooding opened up the opportunity for changes in policy to take place. There is a considerable amount of evidence to suggest that this is the case. However, it is clear that the social and political landscape also has a strong influence over the ability for change to be enacted. This narrative becomes further complicated when local case studies are considered and the scale of impact of flood events differs from the national picture. At the local level there is more variation in national policy uptake and local tailoring enacted by local government. Furthermore, at this smaller scale there is a different polity; one in which the public is more able to engage directly with the process of policy formation and delivery. In order to further explore the assertion put forward in the previous chapter that a crisis, such as the 2007 Hull flood, precipitates changes in the system of governance, it is important to understand the motivations of the individuals who drive, facilitate or block various changes and explore the forms in which they exert their influence.

Following the flooding in Hull, suddenly the relationship between the residents of the city and the local environment was in the spotlight; for so long nature had seemed dormant, controlled and even benign, but it had unexpectedly become hazardous, uncertain and uncontrollable. Despite the fact that Hull is built on drained marshland that is predominantly below sea level and relies on pumps to drain the land, the perception of Hull as a city at risk of flooding had been virtually eliminated since the installation of the River Hull Tidal Barrier (Interview with Local Councillor LAM5, 2010) which put a stop to the annual estuarine inundation of the city, which had previously kept the oral history of flooding alive (Interview with Emergency Planner LAO7, 2010). After the 2007 floods, people's understandings and perceptions of nature also changed; they started to realise that this disaster had not necessarily been entirely "natural"; both residents and officials working in the city referred to the issues around blocked drains and pumps failing, accusing the technology which normally regulates the amount of water in the city of failing and blaming it's custodians for its lack of maintenance (Interviews with Local Planner LAO 10, 2010 and Local Councillor LAM 6, 2010). This is indicative of a growing public understanding of the extent to which nature is subject to

social mediation and the increasing willingness of the public to challenge political and technocratic authority.

5.1 THE EXISTING SYSTEM: REPRESENTATIVE DEMOCRACY

British government uses a system of representative democracy at national and local levels in which each person has one vote with which they can contribute to the choice of candidate to represent their locality for a specified period. The elected representative then acts in the interests of his area on a larger stage. The idea is, as one interviewee puts it;

“The government set the framework, local authorities are providing local leadership, if the public don’t like that, they can kick me out and kick the government out and a new framework and structure can be put in place on the back of it.” (Senior Local Councillor, LAM 1, interview, 2010 pg 7).

This quote sums up the fundamental notion of representative democracy. In England and Wales, Local Councillors speak on behalf of their wards in Local Government matters and Members of Parliament speak on behalf of their constituencies¹⁴ in Whitehall debates¹⁵. The parliamentary and presidential systems are the most common forms of modern democracy. The theory of the representative democracy model is that allocating each person one vote (regardless of gender, ethnicity, education or wealth) and giving them the opportunity to effect change with that vote makes the system legitimate, accountable and inclusive.

¹⁴ They may also have other specified ministerial responsibilities, but this does not diminish their constituency duties.

¹⁵ There continue to be fierce debates even in well-established democracies such as the UK over the way in which constituency boundaries are drawn with regards geographical size, population size, degree of urbanisation, socio-economic and demographic profile (BBC, 2012b). The reason for this is that the UK uses a “first-past-the-post” electoral system in which the candidate with the largest number of votes in each constituency becomes the representative of that area in the House of Commons, as opposed to “proportional representation” (PR) in which the number of seats each party holds in parliament is directly related to the number of votes they received at the polls across the whole country. The difficulty with the first-past-the-post system is that it can result in a system in which on aggregate across the country one party can have the majority of votes, however another party can end up in power if it wins a larger number of constituencies with small populations (Blau, 2004). On the other hand, one of the reasons that it has not yet been replaced by PR is that PR creates difficulties with local representation as to make up the proportions correctly there either have to be representatives who are not associated with a constituency which is problematic in terms of justifying their legitimacy and accountability if they do not have a direct electorate (Brockington, 2004).

One local resident who was interviewed argued that: “ultimately the council is responsible for the welfare of the city” (Local Resident CR5, 2010) which suggests that this person holds the council generally responsible for the affairs of the city. In fact from a legal perspective, local authorities in England and Wales follow the principle of *ultra vires* meaning that “local councils can do *only* what they are statutorily permitted to do” (Wilson and Game, 1998: pg 22, original emphasis).

At the turn of the twentieth century, Hull and the East Riding of Yorkshire were each governed at the local level by administrative county councils who could be described as “the primary agents of local governance, as direct providers of services” (Bulkeley and Betsill, 2003: pg 61). On 1st April 1974, the councils in the area were reorganised (as a result of the Local Government Act 1972) and Humberside (County) Council was created which had a strategic responsibility for the area.



Figure 5-1: Map showing Humberside County Council

Strategic flood risk was managed by the County Council and local plans were made by District Councils.

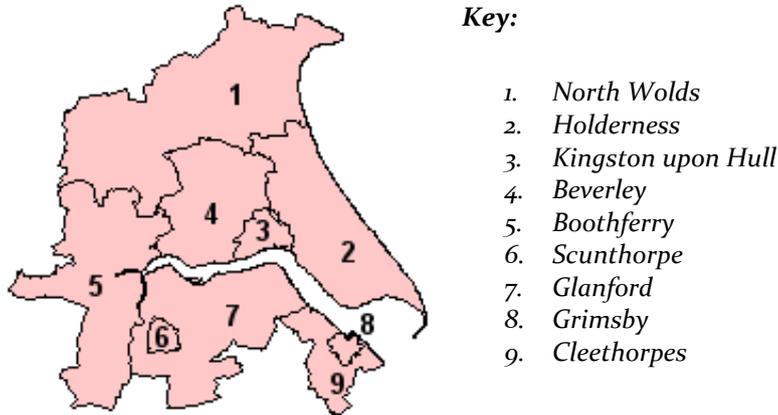


Figure 5-2: Map showing Humberside District Councils

In 1996 Humberside Council was dissolved and several unitary authorities with the combined responsibilities of district and county councils in their area were set up including Kingston-upon-Hull City Council and East Riding of Yorkshire Council (The Humberside Structural Change Order, 1995). The aim of this reorganisation was to reinstate more joined up service provision (Wilson and Game, 1998). However, reforms to local government have reduced their role in the direct delivery of services, significantly restricted their financial capacity and transferred operations to the private and voluntary sectors (Leach and Percy-Smith, 2001). For example, local bus services used to be provided by local authorities in England and Wales but were privatised under the Transport Act 1985¹⁶ (Bulkeley and Betsill, 2003).

There were further implications of local authority reforms which have been quite significant in modern governance arrangements, notably the creation of rigid authority boundaries which did not reflect the river catchments. The delineation of a political area for service provision which does not reflect the natural boundaries can pose a number of problems (Bulkeley and Betsill, 2003). This manifests itself in the boundary between Hull City Council and East Riding of Yorkshire Council. Contrary to the way in which the map presented at the start of this thesis in Chapter 1 depicts the 2007 flood, many areas around the city of Hull were also flooded. The extent of this flooding was simply not recorded and displayed on maps produced by Hull City Council as their administrative boundaries are drawn tightly around the city. In the same vein, the East Riding of Yorkshire Council's map, Figure 5-3, shows the extent of flooding in their area and could inadvertently give the impression that the city of Hull may not have been flooded.

¹⁶ With the exception of London

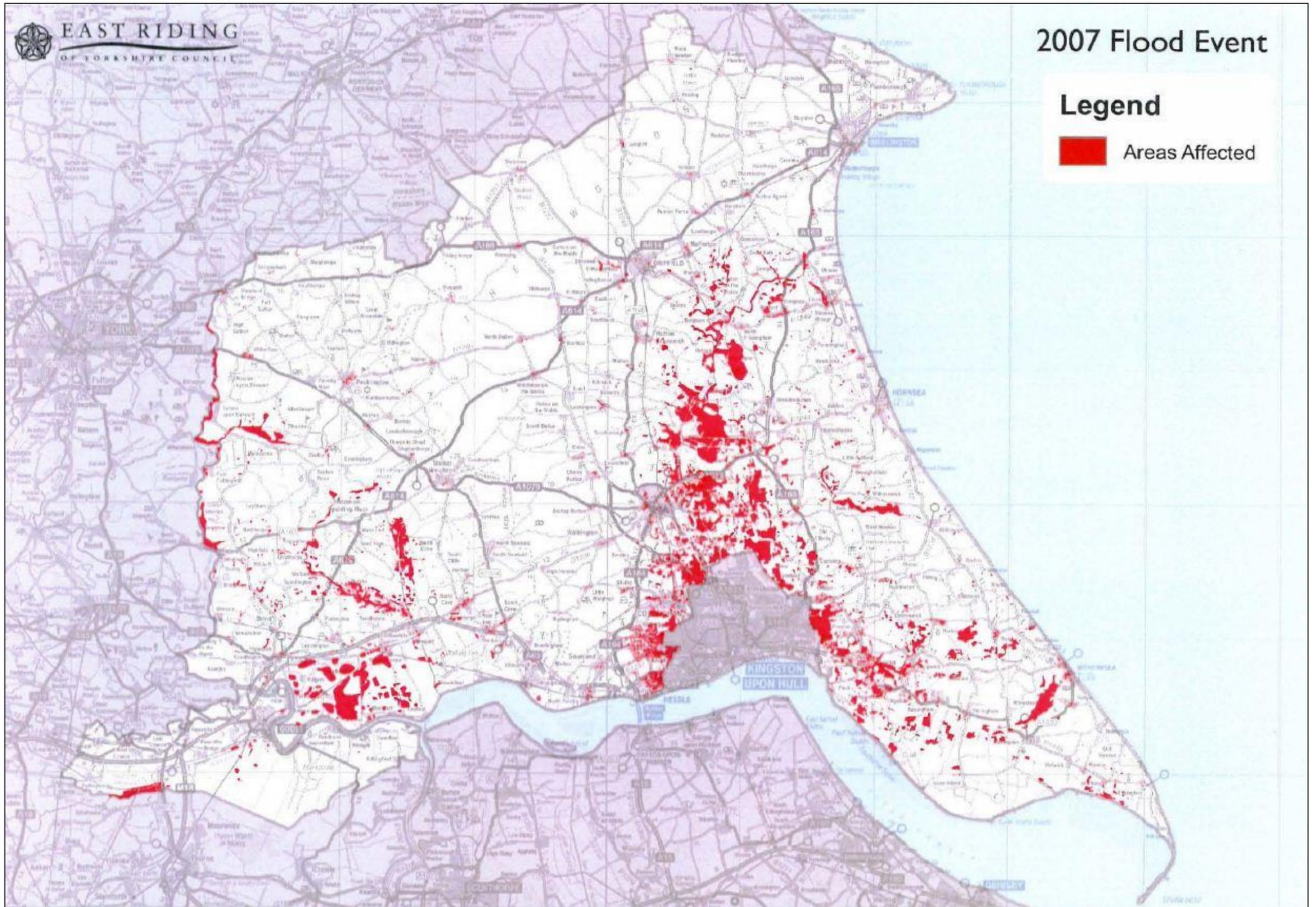


Figure 5-3: Flood Extent in East Yorkshire
(ERYC, 2009: pg 18)

Hull flooded, the East Riding flooded, and despite being hydrologically connected, the two councils have two separate flood governance systems to address the flood risk in their area. Finances for flood governance are particularly contentious across this boundary. In the time of Humberside County Council, resources were then aggregated across the county, whereas now Hull City Council has to stand alone and the villages in the East Riding of Yorkshire which act as more affluent suburbs of Hull, are not part of the same local authority. In fact there are many situations in which the two councils are in direct competition such as for national and EU funding (Interview with Local Planner LAO11, 2011). The economic profile of the city of Hull is one of deprivation (see map below), which highlights the pressures on local budgets following the reorganisation of local authority boundaries and gives some idea of how difficult funding flood risk from Hull City Council's budget might be.

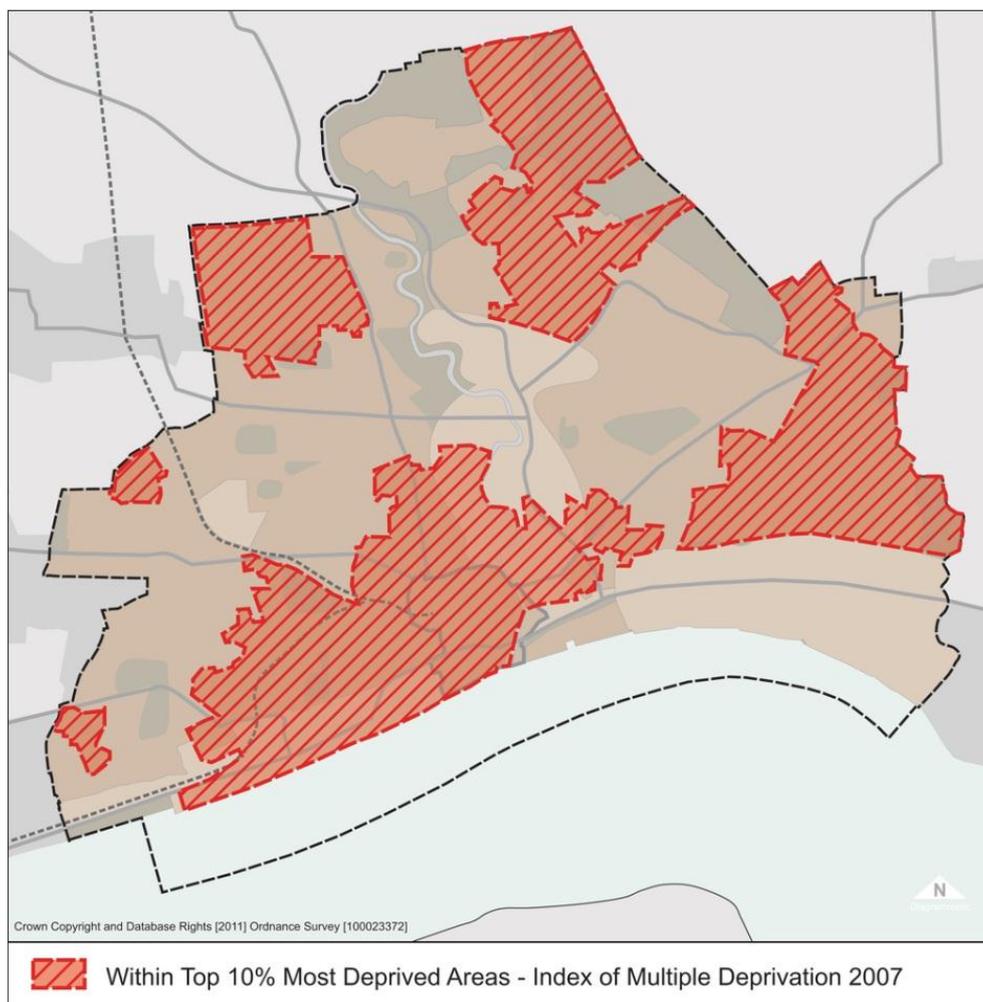


Figure 5-4: Map showing proportion of Hull in top 10% most deprived areas in the UK (Hull City Council, 2011)

Large scale flood defence projects can draw down funding from national government through the Environment Agency, but there is still a substantial role for Local

Authorities in managing flood risk in their area (Brown and Damery, 2002; Handmer, 1996). Increasing awareness of fragmentation created by privatisation and the transfer of services to the voluntary sector has encouraged more focus on partnership working to address many local issues (Bulkeley and Betsill, 2003). This has included some forms of flood risk management in Hull; the Yorkshire Regional Flood and Coastal Committee, made up of local councillors and Environment Agency staff, was set up in 2005 to scrutinise flood policy and practice across the region (Hull City Council, 2005). However, this committee was essentially a way of including local politicians in the Environment Agency's decision-making procedures. The committee coordinates and prioritises tidal and fluvial flood risk management works that are the responsibility of the Environment Agency, rather than all flood risks and they do not have any powers or funding to address the pluvial flood risk facing Hull and East Yorkshire.

5.2 REFLECTING ON THE PROBLEMS IN THE EXISTING SYSTEM

Since the turn of the 21st Century, national voter turnout has dropped significantly as shown below in Figure 5-5.

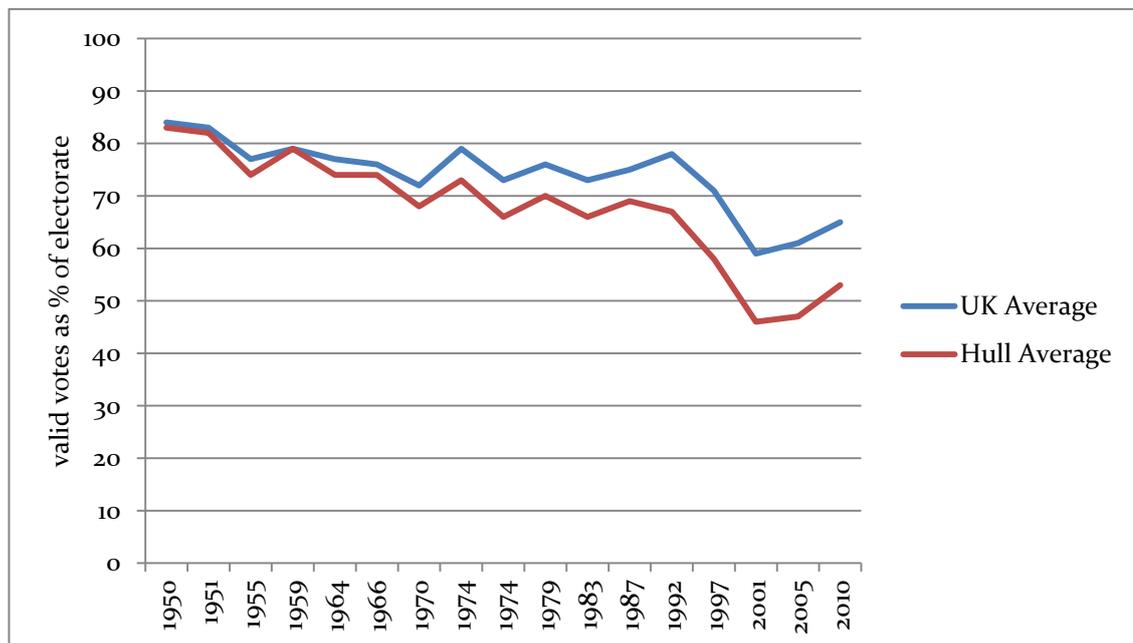


Figure 5-5: Turnout at UK General Elections: 1918-2010
 (Data from: Parliamentary Research Services and Office for National Statistics)

Furthermore, the statistics shows that the city of Hull has a particular problem of lower than average voter turnout that has become increasingly large since the 1950s. Previous studies have drawn links between economic status and voting patterns (Biorcio and

Mannheimer, 1995; Dalton, 1996) and therefore it is likely that Hull's low voter turnout is linked to the city's economic decline in the second half of the twentieth century.

The system of representative democracy only works when the public are engaged and relay their views through voting and communicating with their local councillors and MPs. As voter turnout decreases, the results represent the population's views less accurately, the system becomes less effective and its legitimacy falls under scrutiny.

Lower public participation in the democratic process can be problematic, but it is important to compare this to the alternative of direct participation in the democratic process through community groups or of individuals. One of the most common criticisms of community groups and individuals who become involved in decision-making regards their legitimacy to speak on behalf of the community and questions about how representative their views are of the wider community (Klausen and Sweeting, 2005). Even when community representatives can say that they are backed by a very large group within the community, it is unlikely that they could come close to saying that they represent the views of 50% of the population. Therefore the system of representative democracy is more legitimate and equitable than direct democracy can hope to be.

In recent decades there has been a growing idea that government is part of society's problem, rather than the solution (Bentley and Halpern, 2005; Dobson, 2003). Previously society perceived the nation-state as an "achievement" (Beck *et al.*, 2003: pg 5) and respected and valued its institutions. One local councillor recalled

"when my grandfather was a councillor ... drains and water was important. Politicians got publicity for opening a sewer. ... the public loved it, they were interested in it" (Local Councillor, LAM 5, interview, 2010: pg 13).

However, as society becomes increasingly individualised, the nation-state started to be seen as a "limitation" (Beck *et al.*, 2003: pg 5) and in the modern, increasingly litigious society, governments came to take the blame for many of society's problems (Raco, 2009).

The pursuit of a neo-liberal agenda that was reinvigorated in 1997 when the Blair Government came into power, put into action significant reforms to the welfare state; the role of the state was further reduced through privatisation and, in its place, entrepreneurialism was encouraged. This political environment fostered a shift in public attitudes towards the state characterised by a shift from expectations of the state as a

provider to a new role as a facilitator with a greater role for individual self-reliance (Raco, 2009). Meanwhile, this cultural shift has been accompanied by changing social norms. The general population are better educated than before with more achieving higher education qualifications than ever (see Figure 5-6).

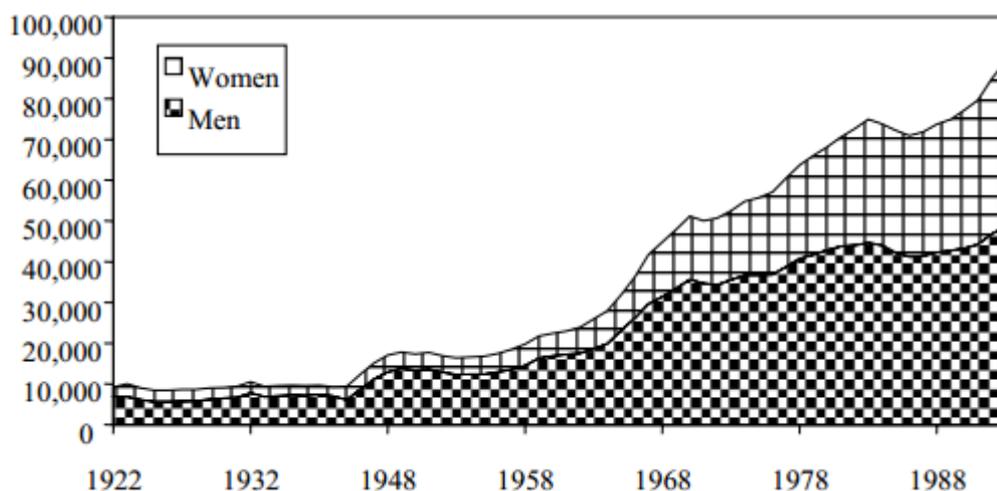


Figure 5-6: First degrees obtained by full-time students at UK Higher education institutions 1922-1993 (Hicks and Allen, 1999: pg 10)

The result of the changing educational profile of the average UK citizen is that their expectations are changing; a new form of citizenship has emerged in which people are more aspirational and forge a new relationship with the state and politics (Raco, 2009). In this new paradigm of individualisation, there is a shift in the basic assumptions of the system of governance; welfare becomes commodified and citizens demand a choice-based 'service' tailored to their needs, as opposed to access to a society-oriented homogenous welfare system (ibid). The reconfiguration of this governance regime means that there is a new form of decision-making in which the public play a strong scrutinising role. As one interviewee put it:

“People are now far more critical of government and authority than they were perhaps 20 or 30 years ago” (Environment Agency Regional Manager, GA 1, interview, 2010 pg 16).

In the latter half of the 20th Century and early part of the 21st Century, Hull had consistently lower than average educational achievement in its schools. The proportion of students achieving five or more A*-C grade GCSEs was just 30% compared to the national average of 50% (DfE, 2011; Hull City Council, 2011) and low levels of qualifications amongst adults when compared to the national averages. In 2001, 41% of adults of working age in Hull had no qualifications, whilst the national average at the

time was 19% (ONS, 2011). It is interesting to note that one of the groups very actively engaged with flood policy-making in Hull were, in fact, from an area on the outskirts of the city of Hull, under the jurisdiction of the East Riding of Yorkshire, which, on average, has better educational attainment and lower number of adults without qualifications (DfE, 2011; ONS, 2011). However, there have been huge improvements in Hull since 2001 and by 2010 only 17% of adults in Hull had no qualifications, whilst the national average had dropped to 11% (ONS, 2011) and the proportion of students achieving five or more A*-C grade GCSEs increased to 75.5%, which is very close to the national average of 76.1% (DfE, 2011; Hull City Council, 2011). Spending on education and training as a proportion of GDP was steadily increasing over this period, from 4.6% in 2001 to 6.3% in 2010 (DfE, 2011). Whilst Hull has some legacy of low educational achievement, the figures indicate that the gap between Hull and the national average is narrowing which suggests that the level of engagement in scrutiny of public policy may increase in the future.

Several interviewees who worked in local government still had very strong belief in the system of representative democracy and the power of public influence using this method.

“I think the community is very active and influential through their elected members. We must never get away from acknowledging that elected members are representatives of the community.” (Local Government Senior Manager, LAO1, interview, 2010 pg 5).

Another Local Authority Officer was confident that the system of representative democracy would lend itself well to public engagement with flood risk, asserting that in Hull

“increasingly flooding and drainage matters will be one of the elements that people are looking to be elected upon.” (Senior Local Planner, LAO 2, interview, 2010 pg 4).

Strang (2004) revealed that residents were most likely to approach a local person such as their MP or local council if they had concerns about water. This was also evident in Hull, where people often spoke of having contacted their MP, local councillor, and appropriate local authority officer, and one of the frustrations they raised was that the person undertaking that role changed and as a result they found it hard to know who to speak to and hard to develop a relationship with them.

Many members of the public voiced their dissatisfaction with politicians and their role in flood policy-making, putting the system of representational democracy under pressure.



by rob37n

Friday, August 12 2011, 9:49AM

“We get a little rain, and surprise surprise the self same gutters overflow yet again. The same people are still at risk as only the minimum necessary is done to fix the problems. The once in a lifetime floods could happen at any minute and we are no better prepared than last time, and all those responsible will run round like headless chickens saying that such an event could not have been predicted. People will suffer endless misery like last time, and not one person in a position to have done something about reducing risk will lose their job, MPs will swan about saying what a problem it is, and nothing will happen until the whole sorry cycle repeats itself.

Figure 5-7: Comment on Hull Daily Mail website
(<http://www.thisishullandeastriding.co.uk/efforts-cut-flood-risk-look-set-fail/story-13118041-detail/story.html>)

The feeling of separation from the parliamentary system is echoed in the voter turnout in Hull which is below the already low national average. The situation is not helped when local representatives in Hull make comments such as:

“Democracy is a badge we all wear but some of us seek to avoid it in private if we possibly can and get on with doing the job.” (Local Councillor, LAM 5, interview, 2010 pg 2).

Perhaps the reason they may try to “avoid” spending time with their constituents is because they would prefer to focus on scrutinising policy and policy-making and whilst this is understandable, it does not help relations between voters and representatives and does not give the public confidence in the system. Other studies have also shown that residents feel that the policy process is politicised (Eden, 1998) and they do not trust the advice that is used to make decisions (Smith and Jepson, 1993).

During the course of interviewing, a number of elected representatives voiced concerns regarding their role in decision-making on flood risk, saying that they did not have enough *power* to do their job properly;

“...you’re scrutinising what partners and the council are doing but if you want to change it, you’re reliant on putting recommendations to people and asking them to listen to you but you don’t have any powers. As a councillor I would like to think that as democratically representative people, councillors have a big influence and have the most power but probably in reality, that’s not true.” (Local Councillor, LAM2, interview, 2010 pg 4 and 6).

The interviewee indicates here that as elected members, they felt as though they should have ultimate power of veto over decisions if they felt they were not in the public interest, but this was not the case. Local Councillors sit on Scrutiny Committees whose

aim is to provide examination and questioning of policy and practice by democratically elected public representatives, thereby legitimising the actions of council officers (Wilson and Game, 1998). In the case of flood risk management, this is carried out by the Environment and Transport Overview and Scrutiny Committee in Hull who have powers to call council officers to their meetings to question them, but they do not have the legislative capacity to enforce action. As another interviewee put it,

“[the] scrutiny [committee] is not a decision making body like the planning committee is. All a scrutiny committee can do is make recommendations. All I can do is write and invite people to come to a scrutiny committee. I can’t order them to... because you look at what they’ve done and basically they can make decisions without asking you or me which is what they’ve done ... so I think powers are all theirs, I’m not in the power game.” (Local Councillor, LAM 3, interview, 2010 pg 6)

This feeling of an inability to effect change was mentioned again and again by local councillors when discussing their role in flood risk policy making:

“I think it’s a bit frustrating when we discuss things and make a recommendation and it sometimes appears to fall on deaf ears” (Local Councillor, LAM 4, interview, 2010 pg 1).

Local residents who tried to engage with policy-making through their representatives also observed this same issue, saying,

“The Council officers run this Council, not the councillors. That’s what we feel... We have four councillors here. They’re well intentioned and try but I don’t think they’re strong enough really.”(Local Resident, CR3, 2010 pg 9).

The quote indicates that the problems of representative democracy are apparent to the general public as well as those involved in the process. This gives some insight to how residents feel and why they might choose to voice their opinions.

5.3 THE PUBLIC VOICE IN HULL AFTER 2007

What constitutes “the public” and “the community” were explored in the literature review and this revealed that these concepts have changed over time with changing work environments and social and cultural contexts. This has occurred alongside an information revolution which began in the 1990s, facilitated primarily by the invention of the internet, which increased access to information in a way never seen before (Katz and Rice, 2002). As Goldsmith (2000 in Katz and Rice, 2002: pg 2) put it:

“The Internet’s influence on disseminating information is equal to Gutenberg’s invention of the printing press.”

Armed with much more information than ever before, the public have become more vocal since the 1990s and play a much more important role in scrutinising government policy on a huge range of issues.

5.3.1 INDIVIDUALS

In 2007, there was public outcry and at the time many people voiced their concerns about both how the floods had come to pass and the way in which they had been dealt with. Many communicated their views via the media: the local newspaper, the Hull Daily Mail, ran a campaign entitled “Never Again”, printed public letters, and ran hundreds of articles detailing the plight of those flooded out of their homes on a dedicated section of their website.



Figure 5-8: Hull Daily Mail Floods Tab
“www.thisishullandeastriding.co.uk/floods”

The media is extremely influential in public perceptions of environmental risk (Roberts, 2004) and therefore the perspective put across by the media is very important. Naming a campaign “Never Again” suggests that the flooding in 2007 is something which the authorities should ensure never occurs again, which is problematic as local and national government are trying to promote public awareness of risk and encourage the public to become more resilient and learn to “make space for water” (Defra, 2004).

Whilst the media is still very important, there are a number of emerging forms of online public debate which have been shown to be strong reflections of public opinion (Das and Chen, 2007). Rheingold (2008: pg 100) refers to this form of public broadcasting as “participatory media” and includes within this:

“blogs, wikis, RSS, tagging and social bookmarking, music-photo-video sharing, mashups, podcasts, digital storytelling, virtual communities, social network services, virtual environments, and videoblogs” (Rheingold, 2008: pg 100).

These activities are very important as they allow information to be generated and disseminated very quickly, cheaply and efficiently (Rheingold, 2008). In terms of flooding there is a significant amount of data that can be generated by the public in terms of sharing their experiences through personal or group blogs and social networking sites, as well as taking and uploading photographs and videos of events as they unfold. There were numerous cathartic outpourings online after the 2007 floods in Hull. Examples are shown below:

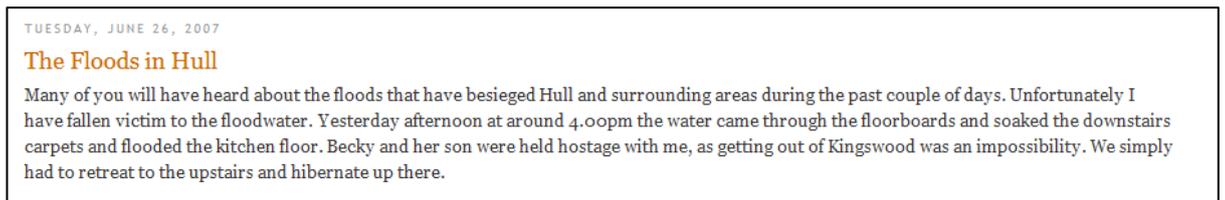


Figure 5-9: The Floods in Hull Blog Post
(Allison, 2007)



Figure 5-10: "The A63 waterlogged - flood!"
(Photo Credit: Foy, 2007)

Examples of public activism and interest were not confined to the media and online forums. After the flooding in 2007 local council officers and councillors stated that there was a sudden peak in attendance of public council meetings in Hull. One Council Officer recounted his experience:

“I went out to speak at a forum that was organised by the Area Committee. It covered areas which were heavily affected in the floods. That was something that the members of that area put together, but usually when you go to an Area Committee meeting there will be a handful of people there. However, because there was a real focus around flooding, I was there on behalf of the Council, the emergency services were there, the Environment Agency were there, and that suddenly meant that instead of a handful of people there, you had 70 or 80 people there. I think groups like that brought people together and enabled them to then organically form their community groups. The fact that it was such a big issue and it affected so many different people, drew them together and from that, people who have some knowledge and ideas, then organically formed the groups.” (Senior Local Planner, LAO 2, interview, 2010 pg 3).

Participative direct democracy is distinguished from representative democracy as the name suggests, citizens are directly involved in the processes of democracy and government, rather than by proxy through their elected representative. In this case study, the characteristics of direct democracy that were exhibited by citizens after the 2007 floods were citizen initiatives and involvement in council meetings (Dalton *et al.*, 2001: pg 142).

Other people used considerably more traditional methods, contacting their local parliamentary representative (local councillors and members of parliament). One senior local councillor recounted his experience:

“I got hundreds of emails; the phone was ringing off the hook. There were thirty thousand calls to the Council’s call centre in a seventy-two hour period. Thousands of calls to the police and that’s interesting itself – the public didn’t know where to go and who to call – the police, the fire service, the Council, the water board, Councillors direct. And some, no doubt, probably called everyone in desperation and panic.” (Local Councillor, LAM 1 interview, 2010 pg 2).

The “panic” in Hull that followed the 2007 flood indicates that the event was important in prompting the public to take interest in flood debates and voice their opinions and priorities through a variety of different channels that will be explored in this chapter.

5.3.2 TENANTS AND RESIDENTS ASSOCIATIONS

There are a number of collective groups of residents in Hull which present themselves in several ways. There are nine local authority coordinated tenants and residents

associations (TARAs) which predominantly focus on tenants in social housing. Investigations into these groups indicated that they had very little involvement or interest in flooding issues, focussing instead on day to day issues such as council property maintenance, refuse collection and anti-social behaviour (Interview with Community Representative CR4, 2011).

5.3.2.1 CASE STUDY OF AVENUES RESIDENTS' ASSOCIATION

Further to the local authority TARAs there are also a number of independent residents groups. One of the longest running is the Avenues and Pearson Park Residents' Association, which is commonly shortened to the Avenues Residents' Association.

The Avenues is a residential area of Hull, with long tree lined streets, characterised by its Victorian and Edwardian architecture and relative affluence. Built in the second half of the 19th century (Hull City Council, 2003b; Hull City Council, 1998) the Avenues were made a council conservation area in 1974 due in part to a number of buildings of architectural significance as well as several listed buildings and grade II listed fountains (English Heritage, 1973; Hull City Council, 1998). A strong community spirit is extolled by its inhabitants in the Avenues and Pearson Park Residents' Association's (APPRA) triannual publication, which describes the area as "probably one of the best preserved Victorian residential areas around" (APPRA, 2012). There is a strong sense of pride about the architecture, "special character" (Hull City Council, 1998) and cosmopolitan atmosphere of the Avenues - the residents association distribute an advice pack to new residents with information and advice aimed to "preserve the integrity and character of the area and to foster community spirit" (APPRA, n.d.). The socio-economic profile of the Avenues is one of relative prosperity and higher than average achievement. The residents are three times more likely to be in a professional occupation than the average for the local authority (Office for National Statistics, 2001b), and the percentage of residents holding a qualification higher than A levels (level 4/5) is again more than three times the average for Hull (Office for National Statistics, 2001c).

Flooding was not previously on the agenda of the Avenues Residents' Association, as one member of the group put it: "*Flooding wasn't on our radar before 2007 at all - subsidence was our previous worry*" (Local Resident CR5, 2010). This is corroborated by the fact that there was no mention of flooding in the Group's meeting minutes between 1998 and 2007 (Source: Avenues Association Meeting Minutes 1998-2007).

However, as many of their members were flooded, members of the committee found themselves being forced to think about the issue. As one committee member recounted:

“because we are in this quasi-official role, people rang me up and asked me where to find sandbags and I had no idea!! I do feel that we should make sure we do know for the future though as I was sorry that I couldn’t be more helpful” (Local Resident CR5, 2010)

As a result of this experience, the group’s discussions swiftly began to include flooding. Flooding was mentioned in three of the five meetings that were held after the flooding in 2007 (Source: Avenues Association Meeting Minutes 2007). Flooding became included in some of their other activities and as a local resident described:

“We were actually collecting our annual subscriptions... As we went round and we asked people if they were flooded. We did a sort of rough survey in our area.” (Local Resident CR5, 2010)

Since 2007, there has been an increased awareness amongst the group of the risks facing the area and despite becoming less frequently mentioned in meetings than in the initial aftermath, it still featured in one of the six meetings in 2008, two of six meetings in 2009 and one of the five meetings in 2010 (Source: Avenues Association Meeting Minutes 2007-2010).

The group undertook a number of actions to try to address flooding in the area. For example, one resident described how they had written to the council suggesting water attenuation at the household level as an option to help manage flood risk:

“One of our members wrote a letter [to the local authority] suggesting extensive use of water butts to alleviate flood risk” (Local Resident CR5, 2010)

Furthermore, the residents’ association attempted to set up a scheme in conjunction with the council to encourage individuals to install household level flood protection devices. A member of the group described this endeavour in a monthly group meeting:

“We did try to see if the council would help us to coordinate a scheme to bulk buy household flood protection devices like airbrick covers, but they weren’t keen and that initiative came to nothing.

Researcher: Did they give a reason for that?

*The council said that the flood was a one off and so we didn't need all that really.”
(Avenues Residents' Association Member, 2010)*

This quote is indicative of the difficulties which the group encountered when attempting to engage with the council on the subject of flood risk. The council evidently saw the group's suggested strategies as inappropriate whilst the residents perceived the council not to be taking action. One member of the group said, *“a lot of ideas have floated around but not very much has been done [since 2007]”* (Local Resident CR5, 2010). Members of the Residents' Association implied that they felt frustrated that this was the case and were unsure whether they should take action to protect themselves. As one resident explained:

“the council hasn't let us know what it has done and whether we should take action ourselves – should we install our own pumps?” (Local Resident CR5, 2010)

Residents also voiced their confusion about whether they were trying to engage with the appropriate organisation in order to address their flood risk or even voice their concerns. One member described this confusion:

“it's a new idea [pluvial flooding] so we're still working out who we need to talk to really” (Local Resident CR5, 2010)

This quote reflects the crux of the difficulties of a modern polycentric flood governance system – it makes it difficult for the general public to engage with. This risks leaving local residents feeling disengaged from the system of policy-making, which appeared to be the case with this group, one of whose members described how *“they [the Local Authority] write reports but then nothing gets done about it”* (Local Resident CR5, 2010). However, the same person went on to say that *“it's very difficult for us to adjudicate it really”* (Local Resident CR5, 2010), highlighting the difficulties the general public face when trying to scrutinise policy and practices in a specialised subject and gives some indication of why the group did not become more deeply involved in decision-making on flood risk in Hull. Tenants and residents associations act as a catch-all for whichever issues face an area at a particular time. They have the potential to play a role in decision-making if the local residents have either the motivation or expertise to pursue a particular issue such as flooding.

5.3.3 ISSUE BASED ACTION GROUPS

In addition to general tenants and residents associations, some topics such as flooding can instigate the formation of targeted issue based action groups which address one

particular problem (Anderson, 1936; Coates, 2009). These groups tend to be formed by interested local residents quickly in response to a particular event with the aim of changing the situation as soon as possible. Their impact on policy making is varied depending on the field in which they are operating; their primary tool for attempting to achieve their goal is advocacy – trying to influence local government, businesses or other decision-makers.

5.3.3.1 CASE STUDY OF COTTINGHAM FLOOD ACTION GROUP

In 2007 the flood waters were not confined to the administrative boundaries around the city of Hull; in fact, many of the surrounding areas were also flooded. One of the worst affected places was the village of Cottingham. It is described by estate agents as “*an affluent East Yorkshire village, which is popular with commuters*” (Preferred Commercial, 2012) and the village’s own website describes itself as:

“a very picturesque village, with its own shopping centre and local facilities. It has quite a bustling, vibrant community, which is perhaps unsurprising given its size and population. It’s on a main rail route, so is easy to get to from Hull.”
(<http://www.cottinghamuk.co.uk>).

Both of these quotes demonstrate the village’s alternative identity as a suburban residence for more affluent workers in the city of Hull.

In late 2007, a group of residents in Cottingham set up a community group with a specific focus on flooding. The Cottingham Flood Action Group is unusual in that it is the only urban flood group in the Hull area¹⁷. It is clear that members were motivated by feelings of disillusionment with the existing system. One local resident described his motivations:

“I became involved in Cottingham’s Flood Action Group because at the time of the flood ... my friend had done a selfless act of donating her kidney and society had kicked her in the teeth - she’d come back home to a flooded house and it’s that motivation that still drives me massively... and then the other driving force is that in the research that we’ve done, we’ve found that people don’t tell you the truth and I’m a stickler for being told the truth” (CR 2 interview, 2010 pg 1).

¹⁷ There are some other flood action groups in the area, but they are predominantly run by farmers and large land owners who are concerned with coastal flooding and managed realignment.

This person clearly wanted and felt the need to act as a voice for their community whom they felt had been put at unnecessary risk and hold policy-makers accountable for the events that had come to pass because they had failed in their duty of transparency to make people aware of the risks they faced. The interviewee did not have any specialist knowledge, but was motivated by his experience and ensuing feelings of injustice as the reality had fallen short of his expectations of the state's responsibility to him.

Other people joined the group because they had an interest in the subject area after working in the field and gaining an intimate understanding of the system and technical details. Having retired, they were no longer bound by contract to impartiality and able to advocate on behalf of whomever they chose:

"I was not flooded, but in the past, I used to work for the Ministry of Agriculture and land drainage and water supplies so I had an interest in drainage... and so when the residents of Cottingham formed the Cottingham flood action group, because of my previous interest, I joined it and I'm just an ordinary member really of the flood action group with a bit of technical knowledge. When we meet, I put that technical knowledge and thoughts forward for consideration." (Local Resident CR3, 2010 pg1)

In this case, this resident chose to represent the interests of his local community and lend his technical expertise gratis in light of the problems he perceived to be facing his local area. The fact that someone was drawn into the process by their educational and career background is reflective of the way that people have been drawn into direct democracy in recent decades as the general level of education of the public has increased, thereby increasing their ability to scrutinise proceedings (Dalton *et al.*, 2001). Meanwhile, public capacity to evaluate the undertakings of the state have been further enabled by the information revolution brought about by the internet, changes in the law on freedom of information and the ever increasing release of data into the public domain.

5.3.3.2 THE COTTINGHAM EXPERIENCE OF ENGAGING WITH LOCAL POLICY-MAKING

Public participation in policy is not always met by local officials with the enthusiasm that would be expected by the wording of national government policy on the matter. The latter is highly supportive of engagement and pushes this agenda with a view to increasing accountability and public acceptance of policy. Scorn for public opinion and participation was evident amongst local councillors when discussing their potential contribution to negotiating Hull's flood risk. As one councillor put it:

“I believe in representative democracy, not participatory democracy. I resist participation with every fibre of my being.” (LAM 5, interview, 2010 pg 14).

This was symptomatic of the awkward relationship between local government and communities who try to put forward bottom-up strategies. As the quote indicates, some local government members and officials do not appear to value input from local residents enough and those who do find it hard to incorporate the public into their system of governance.

In the case of Cottingham, one of the Cottingham Flood Action Group representatives was previously a water engineer and there are other people within the group who used to work for the Water Companies and the Environment Agency. This expertise within the community group was received by the local council in two ways. The high level of specialised technical engineering knowledge engaged some officials; one local councillor recounted how he was:

“contacted by a group known as the Cottingham Flood Action Group and one of those members was a consultant engineer and he offered to mentor me, to teach me about what I should know about the drains et cetera and I spent many hours at his house and talking on the phone to him so I gained quite a lot of knowledge from him and used that to good effect at the [Environment and Transport Overview and] Scrutiny Committee meetings.” (Local Councillor, LAM 3, interview, 2010 pg 2).

This relationship gave the group a route into the decision-making process, a voice in the scrutiny committee and gave more credence to their role once they were in. However, other officials called into question the way in which local lobbyists prioritise their own area at the expense of surrounding areas.

One Local Government Planning Officer who was interviewed stated clearly that certain ideas put forward by the public, individually or through groups, were unsuitable and would not be used:

“...there’s a danger that unless you have some knowledge and understanding of the changes that have occurred, not all of the ideas are necessarily suitable for implementation.” (Senior Local Planner, LAO 2, interview, 2010 pg 4).

One of the basic criticisms of direct engagement in policy is that it can cause issues of injustice if there is not an equal representation of the whole community’s views. This was the case study as the same interviewee went on to directly name the Cottingham Flood

Action Group and accuse the group of having a self-centred, blinkered view of the situation:

“I know, that from dealing with the Cottingham Flood Action Group, that some of their ideas may be good for Cottingham, but the water from there comes into Hull and one of the points they were pushing was about increasing the flow of water and moving it more quickly through the drainage system. That may move it from one location to another, but when you have a very shallow gradient and you’re relying on pumped systems and you’ve only got a certain capacity in your pipes, then actually the rapid movement of water from one location to another isn’t necessarily the way to resolve the flooding issue for the entire catchment. I think that’s one of the problems, of a local focus that the community groups might have. It might sort out their local area, but at the cost of somewhere else” (Senior Local Planner, LAO2, interview, 2010 pg 4).

This was the most explicit accusation levelled at the Cottingham Flood Action Group. However, many others indicated that they were also uncomfortable about the effects lobbying by very localised groups had on the process.

The solution that Council Officers proposed to overcome this problem was that the traditional representative democratic, parliamentary system should remain at the centre of mediation of various actors who come to the table to assist with decision-making around flood risk:

“this is where I think ourselves as the Local Authority, working with the neighbouring Authority are critical and the solutions that we come up with for ways to minimise risk that look at a much wider area.” (Senior Local Planner, LAO 2, interview, 2010 pg 4).

Whilst this interviewee was relatively tactful in the way that they expressed their feelings, others were less diplomatic:

“I work with the professional, if you like. And I tend to stay away from members of the public and community groups because there are a lot of self-appointed experts out there who will then use any opportunity at a meeting and they will turn around and say ‘I’m an expert, I want to do this,’ and we can’t be influenced by that individual, we have to look at the whole thing.” (Local Councillor, LAM 6, interview, 2011 pg 4).

The policy discourse communicated very strongly by the local authority was a strong desire to maintain the existing system of public involvement through elected representatives in order to maintain an even balance of the needs of all areas across the metropolitan area, as the representatives of each area have an equally weighted vote, rather than the most articulate localities becoming the most influential.

Unfortunately, it is conflicts in approach and ethos such as this which eventually led to a deterioration of relations between the two parties. Since their formation in late 2007, the Cottingham Flood Action Group put their ideas for solutions directly forward to the relevant officers and members of their Local Authorities;

“Peter came up with a ten point plan within a month of this action group being formed and he used to write everything down and he had proper format, proper heading note paper and everything and he set out these things and they had a petition to go to Beverley and he presented it. ... We’ve had all of them in this room. The chief engineer of Yorkshire Water, we’ve met the Environment Agency twice, we have a personal relationship that’s excellent, no falling out or shouting or anything silly like that – absolutely spot on. We’ve met Hull City councillors, we’ve met Hull City staff, we’ve met Yorkshire Water staff, and we’ve met Environment Agency staff.” (Local Resident, CR 3, interview, 2010 pg 4 and 5).

As the quote states, local “officials” did meet with this community group, indeed some of them spent a considerable amount of time conversing with members of the group. However, the local authority’s lack of enthusiasm and the slow speed of progress appeared to feel like rejection to the local residents who are unused to the bureaucracy of local government. This frustration is a common finding in studies on public engagement with policy-making (Beresford, 2002). The local residents in Cottingham felt disheartened by their success to date: *“Interviewer: Do you feel like you’ve driven changes? Local Resident: No.” (CR 3 interview 2010 pg 10)*. They were not convinced things had changed and as another put it:

“I fear it had already been got wrong and future flooding that should not be inevitable will happen again regularly. Claims are being made that things are being done but as yet nothing has changed.” (Local Resident, CR 6, interview, 2010 pg 4)

The inclusion of the word “yet” in this sentence though, suggests that there is an element of hope felt by this local resident that they may still hold enough power and influence to execute changes through direct engagement with the decision-making process.

It is important to note that whilst some people were motivated to take action by the 2007 flood event, there were many others whose strongest desire was to get back to “normal” as quickly as possible and this was reflected in their choice to carry out the reinstatement of their homes to be exactly the same as before the flooding happened. By taking this route these residents were effectively leaving the responsibility for managing their vulnerability to flood risk up to their representatives. This is an important part of the narrative of engagement and public activism after a crisis, which reconfirms the fact that an environmental crisis such as a flood is purely an *opportunity* in which changes can take place, rather than a demonstrable driver.

5.4 EMERGING MODES OF PARTICIPATION: DIRECT DEMOCRACY

The compound effect of waning public faith in the representative system, poor communication between various organisations and the public and the advent of a flooding crisis under the existing system appear to have driven some local residents in Hull to seek to engage with the process in a different way. As Newman *et al.* (2004: pg 204) put it:

“direct democracy ... is viewed as potentially overcoming the decline of interest in party politics, and in part because representative democracy is viewed as too hierarchical, bureaucratic and party bound to be able to deal effectively with questions of identity in a multi-cultural and global/local world.”

In the aftermath of the 2007 flood in Hull there was a strong desire amongst other local residents to make physical and social changes in order to increase their resilience should the event ever be repeated in the future. These people were motivated by a desire *not* to return to “normal”, in other words, the same state as before the flooding, but to reduce their vulnerability. They felt disillusioned with their representatives and the existing system; the pursuit of neoliberalism, had led to privatisation, deregulation, public subsidy of private institutions and public financing of the rescue operations in times of emergency, so they chose to try to start to influence things directly (Bulkeley and Betsill, 2003; Bakker, 2005).

Turning back to the example of the Cottingham Flood Action Group, these local residents became active campaigners on the subject of flooding in their area after the 2007 floods in Hull and East Yorkshire. They held regular weekly meetings in a local pub, each of which was minuted and at the time that this research data was collected they had

convened over 100 meetings. One part of these meetings was to distribute and discuss any relevant weather forecasts and the consequent flood potential. The major task in hand though was organising their lobbying efforts by sending feedback to consultation, writing to their representatives, attending council meetings and arranging meetings with various other officials. The main aim of the group's advocacy efforts was simply to increase the political attention focussed on flooding. However, they also conducted their own appraisals of potential engineered risk reduction schemes, which they then passed on to local government officials. The activities of the Cottingham Flood Action Group could to some extent be considered to be public consultation as part of the representative democracy; when members of the committee write to their local Councillor or Member of Parliament, the representative democracy is demonstrably functioning well as it incorporates the voices of the public into the system by proxy through their ambassador in government. However, the other undertakings of the group could be considered to be outside of the normal system of public engagement in representative democracy, and considered instead to be a form of participatory or direct democracy.

5.5 PROBLEMS WITH NEW FORMS OF PARTICIPATION

Participatory direct democracy naturally comes with its own set of criticisms. Firstly, direct democracy cannot be upscaled; it is "unable to function efficiently in large polities" (Dalton *et al.*, 2001: pg 142). Strang (2004) examined local public engagement with water policy in the Stour Valley and found that the inclusion of community groups was effective in representing the public voice at the local level and gave those involved a sense of ownership and involvement, but that "the mechanisms enabling local engagements to move upwards are weak" and therefore on the fundamental issues around water and flooding, national government is still the key player and the public remain a "spectator".

One local council officer interviewed pointed out that:

"having lots of little community groups establish isn't necessarily the most effective way to make sure that the community's views are influencing the decisions that are taken" (Senior Local Planner, LAO 2, interview, 2010 pg 4).

However, here the scalability is not the primary use of a local case study, but simply a small window's view of the processes playing out at the local level. Another tenet of direct democracy is the issue of representation, which was raised time and again. The

most overt example of this in the interviews was the following assessment from a Local Government Planning Manager who said:

“the groups aren’t a bad thing, I wouldn’t say that, but I wonder whether they do really reflect the community” (Senior Local Planner, LAO 2, interview, 2010 pg 4).

When asked whether local residents in the Cottingham Flood Action Group had considered their own position as community representatives, one reflected:

“Oh well, I think somebody did once, I think it was a parish councillor who said ‘who are you to represent the village of Cottingham? Who appointed you?’”

“Interviewer: How does that make you feel?”

“She’s a silly person!” (Local Resident, CR 3, interview, 2010 pg 9).

There were varying opinions expressed by the public about the work that Cottingham Flood Action Group were undertaking, some good:

“We should put them in charge of coordinating all the authorities that have a responsibility for reducing flood risk.” (Comment on Hull Daily Mail Online, 2011).

Others were less supportive: *“What sort of engineer is he? Those ponds on Eppleworth Road look plenty big enough to me.” (Comment on Hull Daily Mail Online, 2011)* questioning the Cottingham Flood Action Group’s authority.

The extent to which community initiatives such as the Cottingham Flood Action Group truly represent the interests and views of their community is evidently in question. However, even if they do not fully represent the opinions of their area, their role should not necessarily be completely discounted (Eden, 1996). The important thing to distinguish when community groups become actively involved in policy-making and that is whether they are conducting issue based lobbying or whether they claim to be community advocates (Howgate and Kenyon, 2009). The problem is that this can be hard to define; even though the Cottingham Flood Action Group are issue based by name and nature, when they advocate changes to flood policy using the words “we want...” it is unclear exactly who they are referring to – only members of the group or residents of the area more broadly.

When the community become involved with direct democracy, there can be problems around unmediated lobbying, not only because the views may be unrepresentative, but

also because they may be put forward in an inappropriate way. One local Councillor recounted their experience of one such unmediated event:

“a community organisation ... asked us to turn up to a particular event. It was held in a pub and if you want my experience from that it wasn’t the best idea in the world to get a lot of people that had been through a very traumatic period within 3 months in a pub with a few beers being able to question as to why their houses were in bits. It was a huge learning curve and I wouldn’t do it again.” (Local Councillor, LAM 9, interview, 2010 pg 2).

Whilst this was not a characteristic picture of community action in and around Hull, it demonstrates the risks of unmediated public activism and the negative effects that this can have on the process.

5.6 THE PERSISTENT PROBLEMS OF PRIVATISATION

“Privatisation is a very transparent enclosure” and the privatisation of water is highly contentious as it changes the motivations of the organisation overseeing the operation of the water and sewer network (Strang, 2004). In order to unpack the question of power in decision-making we must turn to the issue of privatisation which came up as one of the key issues again and again when interviewees were asked to reflect on the problems of the existing system. Local councillors elected to scrutinise decisions on flood risk felt unable to carry out these duties:

“...we asked for a copy of the minutes from the first meeting of the [Multi Agency Flood Forum] Committee. Unfortunately we didn’t get it. What I can’t get my head around is, we actually recommended that [the] committee be formed and yet they didn’t want to give us the minutes of the meeting to let us know what was discussed or what was decided or if, in fact, did a meeting take place; how many meetings have there been?” (Local Councillor, LAM 3, interview, 2010 pg 3 and 7).

The reason that was given for these minutes not being released for scrutiny was the presence of a private limited company at meetings. A local council officer described the problem;

“the Multi-Agency Flood Forum minutes are not made public. I seem to remember that the [Environment and Transport Overview and] Scrutiny Commission wanted to see them, but we persuaded them against it. People like Yorkshire Water simply wouldn’t turn up if things that they were saying in that forum were made public. ...

They're operating in a commercial world; we talk glibly about transparency and non-collusion, but in the commercial world it's very different and I can appreciate their position.” (Local Government Operational Manager, LAO1, interview, 2010 pg 3)

As another interviewee put it:

“we have to recognise that they [water companies] have commercial pressures that public bodies don't; they have shareholders to satisfy and that sort of thing.” (Environment Agency Manager, GA1 interview pg 13).

Council officers were put in a difficult situation by the fact that they were trying to work with many different organisations each of whom had very different policies on public accountability and indeed very different motivations for engaging in discussions:

“I think that's an interesting issue about engaging with the water company because if you look at the actors in flood governance, the vast majority of these organisations are either community groups, public sector or charities; the only ones with a sole private dimension to them are the water company, so clearly the drivers and the responsibilities are significantly different to the vast majority of the others. In terms of how they are involved in the process, just quite simply, I'm not saying it's a fault or a difficulty in taking things forward, but the water company are accountable to their shareholders, whereas the vast majority of the other organisations involved are accountable to the public ultimately. So, therefore, the reason for taking things forward and addressing flood risk with a long-term focus are different; the drivers are different.” (Senior Local Planner, LAO 2, interview, 2010 pg 1).

Even when these issues are discussed, the tensions seem to remain; so it is not just a question of misunderstandings, it is a disagreement in principle:

“some of these meetings have been behind closed doors and I know there have been some justifications made for that but I'm not entirely sure that they're correct justifications for making something not transparent because I think that everything, as much as possible, should be transparent so I'm not really sure but I think there are some things that could be done better.” (Local Councillor, LAM2, interview, 2010 pg 6).

Qualms about the system of representative democracy are exacerbated by the problems of privatisation as there is a sense that power can become dislocated from accountability (Bulkeley and Betsill, 2003).

“When the local authority has that mandate but it’s working with other agencies which are un-democratic because they do not have the same accountabilities, it becomes quite difficult if the resource and power sits there but the democratic accountability sits elsewhere and that’s with the local authority and that’s where the tension could arise and that’s where it is very difficult and so how do you open up that power and decision making to democratic accountability through different mechanisms? Or how do you completely reshape the way that the governance works to give the local authority more power over that resourcing and decision making that may sit in these autonomous organisations that are not democratically accountable?” (Local Government Communities Manager, LAO 8, interview, 2010 pg 10).

The water company’s mandate is to supply potable water, sewerage services¹⁸ and sewage treatment (Water Act, 1989). The water companies were set up to try to improve efficiency in the water industry and in the pursuit of this agenda, their objective is not to provide the highest quality service possible, but to provide the best service they can within a strict economic framework (Bakker, 2005). At times, water companies have failed and been accused of failing to achieve even the minimum service delivery requirements by putting their financial objectives first (Lobina and Hall, 2001; Bakker, 2000). This has been a particular concern in Yorkshire and in 1996 an Ofwat report into the practices at Yorkshire Water found that:

“serious failures to ensure a reliable and continuous supply, as well as to control leakage and flooding from sewers had to be related to the company’s dividend policy” (Lobina and Hall, 2001: pg 9)

When utilities are privatised, it is widely accepted that this process should be accompanied by at least some form of regulation to try to negate any problems that might arise and retain some power over the company to step in to protect public interests. The Water Services Regulation Authority in England is called Ofwat. It is a

¹⁸ As a part of sewerage, the company is also responsible for controlling sewer flooding which is regulated by Ofwat (Lobina and Hall, 2001). This is a very tightly defined type of flooding occurring when water is ejected from the sewers and the water company was keen to support the idea that the flooding in 2007 was pluvial flooding, which is described as flooding arising because the drainage system is already full (Scottish Environment Protection Agency, 2009).

non-ministerial government department responsible for the economic regulation of water and sewerage. However, some interviewees expressed their concerns about its role in proceedings, saying:

“I don’t feel that they’re really able to force the water companies to have to invest in improving infrastructure. ... Ofwat’s reason for being brought in was to regulate the water price.” (Local Government Planning Manager, LAO 9, interview, 2010 pg 11).

The officer expresses several areas of concerns about regulation, but most importantly raises the fundamental issue that Ofwat are primarily price regulators rather than flood risk regulators.

Yorkshire Water responded to questioning on their subject of how satisfactorily the mechanisms for accountability and transparency were operating by simply stating *“it’s been decided by a democracy so therefore is democratic” (Water Company Senior Manager (PC 1) interview (2010 pg 7).* This statement is fairly defensive and assumes that the democratic system is operating sufficiently well to enact changes if the public are unhappy with proceedings. Clearly, the private water companies are unlikely to be keen to be subjected to more scrutiny, but again the way that they avoid the discussions altogether does not instil a feeling of cooperation and reciprocity.

The representative system is not alone in finding difficulty undertaking its functions following privatisation; local residents have also faced the same problems of lack of transparency, access to information and lack of enthusiasm in partnership working. These fundamental problems raise the important question to what extent can governance systems be accountable in an age of privatisation.

5.7 THE FUTURE OF PUBLIC ENGAGEMENT IN FLOOD RISK

A combination of falling voter turnout, individualisation, privatisation and increasing general levels of education, coupled with the information revolution that the internet has brought, has changed the social and political background to policy-making. Furthermore, recognition of the role of the public voice in the decision-making process has also changed as various governments have pursued an agenda of public participation more broadly in government (Blair, 1998; Cabinet Office, 2010).

In the aftermath of the 2007 floods, many residents of Hull wanted to express their views. Some people chose to channel this through their elected representative who described how much busier they had been attending to their constituents after the

flooding – representative democracy in action (LAM 1 interview, 2010). Other people chose to group together and engage with policy through a community group, which is an example of direct democracy. Finally, there were also a number of people who simply wanted to voice their opinions, but did not necessarily engage with the processes of decision-making and policy.

The evidence set out in this chapter shows that in the aftermath of the flooding in 2007 in Hull two forms of democracy, representative and direct, were both operating at the same time. The following quote articulates the way that representative and direct democracy can be used in combination when community groups make their voices heard through both avenues:

“even if people set up action groups, they do tend to channel a lot of that through Councillors and the Council.” (Senior Local Councillor, LAM 1, interview, 2010 pg 9).

This indicates that both representative and direct democracy are operating in the area, cyclically rising and falling in popularity in the post-disaster environment as shown in the figure below.

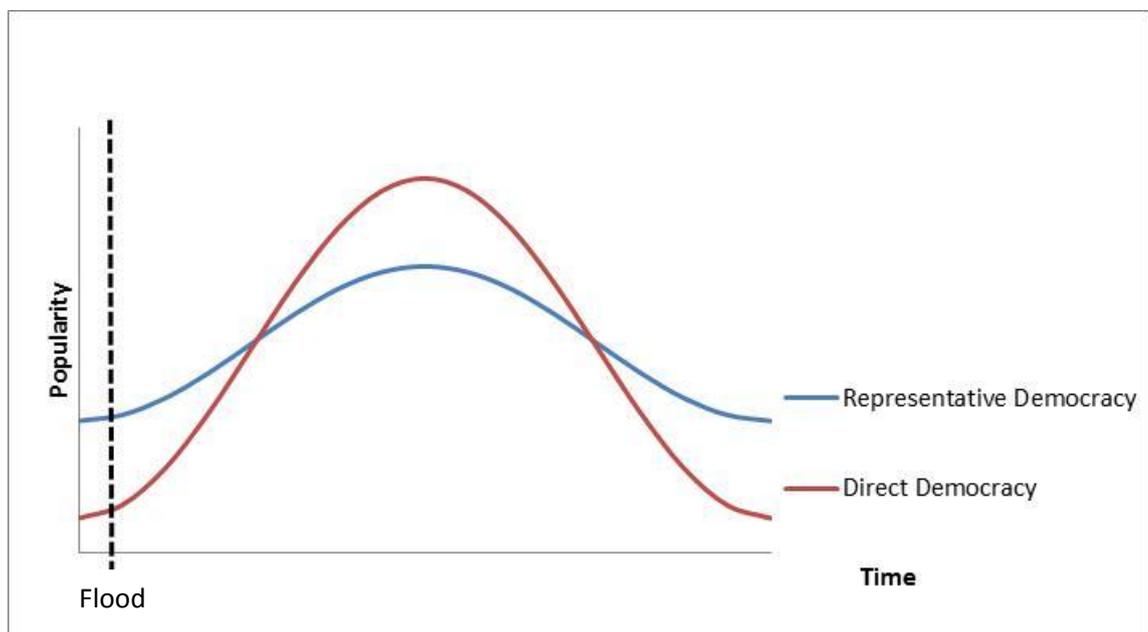


Figure 5-11: Graphic depiction of the rise and fall of representative and direct democracy.

To explain this using the graph, at the time of flooding there was little public activism on the subject of flooding and elected representatives are undertaking the decision-making on behalf of the public. When the flood event took place, this opened up the opportunity for change. Some people chose to voice their opinions to their MP or local councillor

who as a result scrutinised flood policy with renewed vigour. However, this was not the only form of public participation in flood policy observed in Hull at the time. As feelings of disquiet with the existing system of representative democracy had been growing in the broader social context, some citizens were spurred into direct participation and there was a surge in the popularity of direct democracy. Both forms of democracy continued to be more popular than usual until the peak of public interest had been reached, either because issues had been resolved or simply time had passed and memories had begun to fade. At this point, the amount of public activism began to fall away. Without the involvement enthused citizens, direct democracy falls back to low levels and the majority of the responsibility shifts back to public representatives.

Direct democracy can take a number of forms as discussed in this chapter. Issue based action groups are distinct from generalised residents groups; they have an agenda for engaging on a particular issue rather than a catch all for local issues. The Cottingham Flood Action Group engaged more with flood risk management in Hull than the Avenues Residents Association and appeared to have had more influence over proceedings, but they are a recently formed group whose membership and levels of activity would likely wane over time as with other issue based action groups – when the prominence of the issue in question fades (Senior Local Councillor LAM 6 interview, 2010). By contrast, the Avenues Residents Association has been running for much longer and is flexible enough to adapt and engage with whatever local issues become important. It is impossible to make any assumptions about one form of community group action being better than another and it is more useful to acknowledge the fact that the community voice manifests itself in a number of different ways at different times. The flood governance system needs to be flexible and facilitate these different forms of engagement – listening to flood action groups who are inspired to act after an event and also maintaining good links with individuals through community groups and elected representatives. The concept of the community is constantly changing and local officials must keep abreast of changes in order to fully engage with the public as they have a significant contribution to make to the understanding of flood risk in their local area (Wynne, 2004). However, with the loss of transparency that comes with privatisation, it is very difficult for the public to scrutinise the flood risk management operations undertaken by the private water companies and as a result the public currently rely heavily on national and local government to scrutinise and regulate the water companies (Bulkeley and Betsill, 2003).

This chapter has focussed on the ways in which the community voice manifests itself and its opinions in representative and direct democracy. Allowing both to take their place in

decision making, enables the public to be involved in policy making and the opportunity for change following a flood event to be supported by the socio-political environment. The increase in public engagement in decision-making through direct and representative democratic channels creates the political pressure on policy-makers and in the event that a policy window opens up (as discussed in Chapter 4), gives those policy-makers the mandate to enact changes in flood risk management. The final empirical chapter which follows goes on to discuss the discourses of competing interpretations of scientific and technical knowledge, which exist within the social conditions outlined in this chapter and are therefore part of the process of production and co-production of flood risk.

6 GENERATING FLOOD KNOWLEDGE AND UNDERSTANDINGS

In the previous empirical chapters the roles of crisis, opportunity and public participation were examined in the context of the evolution of flood governance and how it changes. The conclusions of these chapters indicated that one of the key factors shaping the path of flood policy's evolution was the framework of knowledge within which the risk, hazard and disaster were conceptualised. With specific reference to pluvial flooding, this empirical chapter explores the generation and dissemination of information and the processing and incorporation of knowledge into policy and practice, tracing the nature of what constitutes a flood and therefore what constitutes the appropriate scientific knowledge changes over time and how this effects changes in flood policy and practice.

Hazards only exist in planning and mitigation policy if they are understood to pose a risk to society (Interview LAO10, 2010). Hull was aware of the risks it faced from fluvial and estuarine flooding, but pluvial flood risk was not recognised as a threat locally (Interview LAM6, 2010) or indeed nationally (HMSO, 2009). In a policy review after the 2007 flooding, the government found existing flood legislation to be too narrow in its focus, lacking the capacity needed to manage flood risk effectively and without mention of pluvial flooding (HMSO, 2009). This raises several questions. How is knowledge about pluvial flooding generated? How does this influence pluvial flood risk management in the future? And how does changing knowledge and perceptions about flood drive change in flood risk management?

Guston (2000) argues that science and politics are separate entities, science is unaffected by political context and politics is unaffected by scientific controversy. Whilst this may be desirable, in order to preserve the integrity of scientific endeavour and allow politicians to justify policy with expert knowledge, it is over simplistic and therefore not a widely held academic view. The two, in fact, are considered to be inextricably linked; the context in which science is carried out can have a huge impact on its content, outcomes and findings (Jasanoff, 1990). Knowledge is therefore co-produced by science and politics (Latour, 1993). In this chapter knowledge is understood to be the product of information and understanding. Information, which is constant, is distinct from

understanding, which is variable, contextual and open to interpretation. This chapter will examine the context in which flooding occurred in 2007 in Hull and then was conceptualised as a new risk, of pluvial flooding. It will examine how knowledge of this new risk is generated and then the way in which this can be used to manage pluvial flood risk.

6.1 UNDERSTANDING THE HISTORICAL CONTEXT OF FLOOD PERCEPTIONS AND KNOWLEDGE

Society's perceptions and understandings of flooding are intrinsically linked to experience; scientific knowledge of flood modelling and forecasting is based on empirical data of past flood events. The model of knowledge production for flooding is reactionary (Haque *et al.*, 2002), making the historical context key to understanding flood risk. An examination of whether pluvial flood risk is systemic or an anomaly is fundamental to understanding the 2007 flood event in Hull and is revealed through the analysis of the legacy of land drainage, industrial revolution and urbanisation. As one interviewee put it, *"you've got some flood issues around the built environment, which have naturally happened over time."* (Community Representative, CR1, interview, 2010 pg 7).

6.1.1 LAND DRAINAGE

Society's perception of flooding varies over time and space. In the UK, the natural environment is not generally perceived to be risky; the climatic regime is described as "temperate", without extremes of temperature, wind or precipitation (Met Office, 2011). Pre-industrialisation, the economy was focussed around agricultural production (Gillett and MacMahon, 1989) and the flood regime of the country's rivers was embedded within the local institutions as well as the social and cultural practices (Scrase and Sheate, 2005). In Hull, for example, maps from the eighteenth century, see figure 7 in Chapter 4, show that Hull was enclosed by walls which gave some protection against flooding from the River Humber (Tickell, 1798). The surrounding land was used for agriculture and in fact, throughout the eighteenth century flood waters were encouraged to inundate the land in order to build up the ground level through siltation, a process known as warping (Sheppard, 1909; Jarvie *et al.*, 1997). This was complemented with the installation of a comprehensive system of drainage ditches, but as the Bulmer's Gazetteer (1892: Part 11) described the:

"great drawback to the effective drainage of Hull is its flatness, near level with the waters of the Humber. From this cause the drains were only open for the discharge

of sewerage during the few hours each day when the water [in the River Humber] was at its lowest ebb”

But in 1883 *“this defective state of things was remedied when a pumping station was erected”*. The city continued to grow up around the new emergent flood regime, with people who lived in low lying residential areas of the city finding their own ways to cope with inundations:

“My family didn’t used to have any furniture downstairs in the house, so when the floods came they just brushed it through and let it dry out.” (Local Resident, CR5, interview, 2011: pg 1).

However, things were changing and the pumping station was an example of the transformation in the relationship between the residents of Hull and the local environment including the flood regime, characteristic of a similar picture across the country.

6.1.2 INDUSTRIAL REVOLUTION AND EARLY URBAN GROWTH

The industrial revolution transformed the economic and labour systems in the UK beginning in the eighteenth century. People left agriculture to work in factories accelerating urbanisation. By 1900, 70 per cent of the British population lived in cities (Hamnett, 2005). The result of industrialisation was to dissolve the links people had with the natural environment and thereby change the fundamental basis of their livelihoods. Meanwhile, the effects of urbanisation in terms both of sheer increase of urban housing and of those householders exercising their right to connect each property to the drainage system to discharge foul water, changed the physical environment in which flood risks were negotiated (Hewitt, 1997). The risk to human life both from drowning, disease and famine induced by crop failure diminished, but the cost began to be counted in monetary terms (Wisner *et al.*, 2004). It is important to recognise that livelihoods were still at risk, whilst the form of exposure changed.

6.1.3 URBANISATION

Flooding from rainfall is influenced by several factors, such as steep catchment topography (Hand, Fox and Collier, 2004), rural land use, interception by vegetation, changes in land cover (O’Connell *et al.*, 2007) and snowmelt (Collier and Fox, 2003), but of particular importance recently is the permeability of the ground surface (Hand, Fox and Collier, 2004). Land can become impermeable naturally as it becomes saturated, but there are particular problems associated with anthropogenic activities and as is the

case in Hull, urbanisation and associated concrete surfaces compound the problems of overland flow and consequently flooding (Kjeldsen, 2010).

Since the industrial revolution, the move towards urbanisation has continued with urban residents accounting for 81.4% of the total UK population by 2010 (Office for national Statistics, 2011). As urban areas have come to house the majority of the population in the UK, so they have also become the primary site of development. Each new house has put more and more pressure on the urban drainage system.

“What happens with a new build – it may be designed with a good standard [of drainage] but as further development occurs, that plugs into the same system, that standard can start to decline” (Local Planner, LAO9, interview 2010, pg 8).

This has not gone unnoticed in the community, as one resident remarked:

“It’s a vicious circle. No sooner does Yorkshire Water build or make alterations to the drainage/sewerage systems so that it can cope with the present levels of housing than Hull Council gives permission to builders and companies to build more properties. Whoever could have imagined that during the nineties when the new sewerage tunnel was planned that a 10 foot diameter tunnel could not cope? This IS a floodplain after all and there is a limit to what can be accommodated” (Online comment, local resident CR8, 2011).

In 2006, a joint report by Ofwat and Defra remarked that “companies may need to put in new capacity where this is necessary, though land use pressures are always going to make this difficult and time consuming” (Ofwat and Defra, 2006 pg 108).

Pressure on the drainage system is increased not only by the addition of foul water drains from new houses, but more recently further pressure has been added as the area of impermeable surfaces, which drain directly into the sewers instead of natural soakaways has increased.

“The problem arises to varying degrees across the country but mainly in inner city areas with parking pressures” (Lichfield, 2003: pg 239).

In recent years travelling by private transport has become the norm and by 2008, 81% of the UK population had access to a car (RAC, 2008), all of which require parking spaces. This has led to an ever increasing trend of home owners turning their front gardens into driveways. Reports prepared for other local authorities such as Ealing Borough Council have stated in no uncertain terms that

“hard surfacing of front gardens causes problems of increased rain water run-off, increased fluctuations in amount of water going into storm drains and thence into local streams and rivers; the end result of which is increased risk of flooding, especially flash flooding.” (Healey, 2004: pg 49).

Interview data gathered during the course of this research showed that this is also an issue in Hull. As one local councillor put it;

“people have got to stop concreting their gardens – in one area where there was extensive flooding [in 2007], people were putting in applications to turn their front gardens into car parking by putting in an application for a drop down kerb. In my view they’re not acceptable, where it’s a serious flood area, we’ve got to make sure that we keep that green space.” (Local Councillor, LAM3, Interview 2011: pg 1).

Another local councillor remarked that some local residents in Hull had made the connection between the increase in impermeable surfaces and flooding as they made comments such as *“don’t put any concrete down because we don’t want any more flooding” (Local Councillor, LAM2, Interview 2011: pg 2).*

6.1.4 THE AGE OF EXPERTS

As explained in Chapter 4, flood risk management was undertaken locally until the early twentieth century, when responsibility was transferred to the government under the Land Drainage Act 1930 (Scrase and Sheate, 2005). This new regime required new information and understandings with universal applications that could be used to take decisions nationally (Porter, 2010). Technical, science-based language had greater legitimacy in policymaking (Wynne 2004; Fischer 2000). Scientific rationality became the most influential type of knowledge and society became “highly dependent on expert forms of knowledge” (Burgess, 2004: pg 302). Expert and scientific knowledge is more widely incorporated into policy-making and given more credence than lay knowledge (Wynne 2004; Eden 1998). The increased prominence of experts has left the public feeling as though their knowledge is devalued as it lacks the qualification of experts (Burgess, 2004). This was reflected in the comments made by local residents in Chapter 5 about feeling undervalued when they discussed how their input into policy-making had been received.

6.2 THE INVISIBLE RISK OF PLUVIAL FLOODING IN HULL

The ultimate cause of pluvial flooding in Hull is a product of building in a flood plain. As discussed in Chapter 4, the flood event and therefore observed risks of the twentieth century were fluvial and tidal in nature, and reactionary policy was put in place to manage these risks, but the discussion of the legacy of human activities over time shows that the risks were altered by the undertakings of the population living in flood risk areas. Despite not necessarily intending to alter flood risk, activities such as land drainage and urbanisation have had a transformative effect on the physical environment and the flood regime. The effects of these changes on vulnerability appear not to have been fully recognised as the focus of flood policy on fluvial and tidal risks took precedence. In Hull, as one interviewee put it,

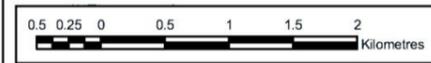
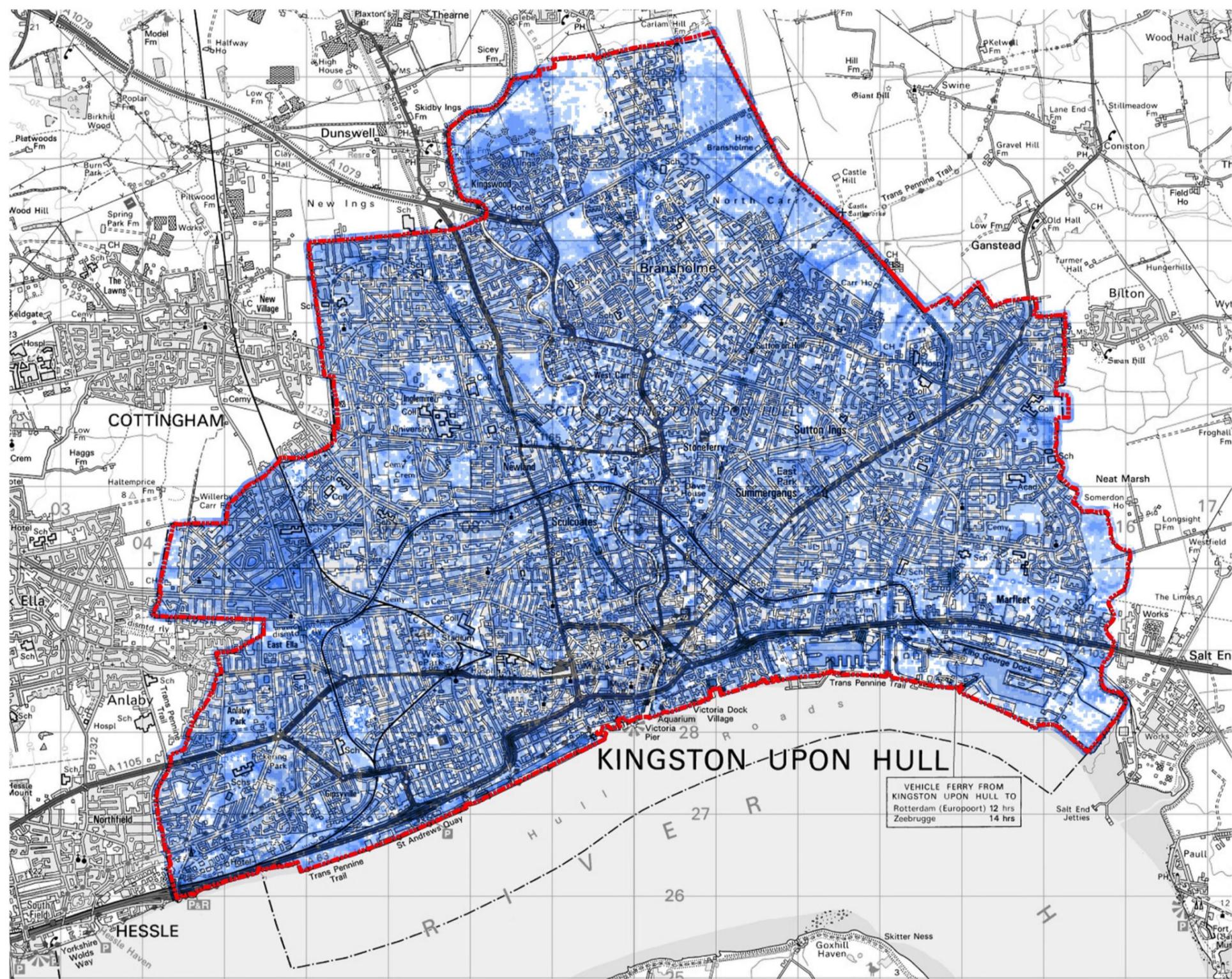
“The irony of 2007 is that the city’s flood defence plan worked¹⁹, but could we tell that to the thirty-five thousand people who were affected? The river never burst its banks – the flood defence barriers were working at the mouth of the Humber and effectively thirty years of flood policy was looking to the estuary and the river, not to surface water” (Senior Local Councillor, LAM 1 interview, 2010 pg 4).

The scientific knowledge that was incorporated into the policy-making process in Hull was not erroneous, but it simply focussed on the riverine and tidal flooding threats to the city as that was the historical precedence and therefore that was the given political and social direction. Flood warnings were available based on water flow levels through the various drains around the city as well as the Rivers Hull and Humber, but not the levels in the drainage network (Hull City Council, 2007). The focus was elsewhere: *“everyone saw the risk as coastal, estuarine and river flooding and not from pluvial flooding” (Local Councillor (LAM 1) interview, 2010 pg 4).*

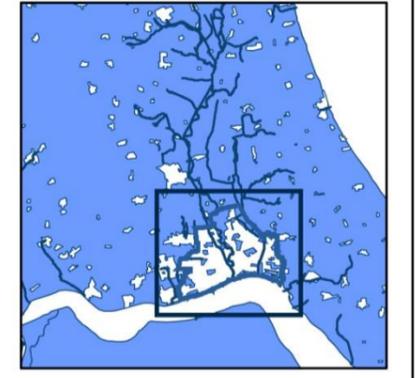
The map below, Figure 6-1, shows the extent of the flooding in Hull in 2007 and gives some indication of how widespread the problems were.

¹⁹ Indeed, this statement is supported by the Strategic Flood Risk Assessment which focussed heavily on fluvial and tidal risks and classified the majority of Hull’s flood defences as being in “very good” or “good” condition (Hull City Council, 2007).

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Location Plan :



Key :

- Hull City Council Boundary

Surface Water Flood Depth (25th June 2007 flood event)

	0.00 - 0.05m
	0.05 - 0.15m
	0.15 - 0.30m
	0.30 - 0.60m
	0.60 - 0.90m
	0.90 - 1.20m
	> 1.20m

Figure 6-1 Map showing depth of 2007 flood waters in Hull (Hull City Council, 2007)

One of the worst affected by the flood waters was an area called Derringham in the west of the city. However, the Strategic Flood Risk Assessment which the Local Authority had in place at the time of flooding in 2007, designated the majority of Derringham as “low hazard”, as shown in Figure 6-1. This was because the assessment and zoning was based on the risks posed by tidal and fluvial flooding and therefore the areas thought to be most at risk were close to the River Hull and River Humber; as MP Stuart said in Parliament afterwards, the “flood maps, according to local residents, did not truly reflect the situation on the ground. Many of those people flooded last summer.” (Hansard, 2008).

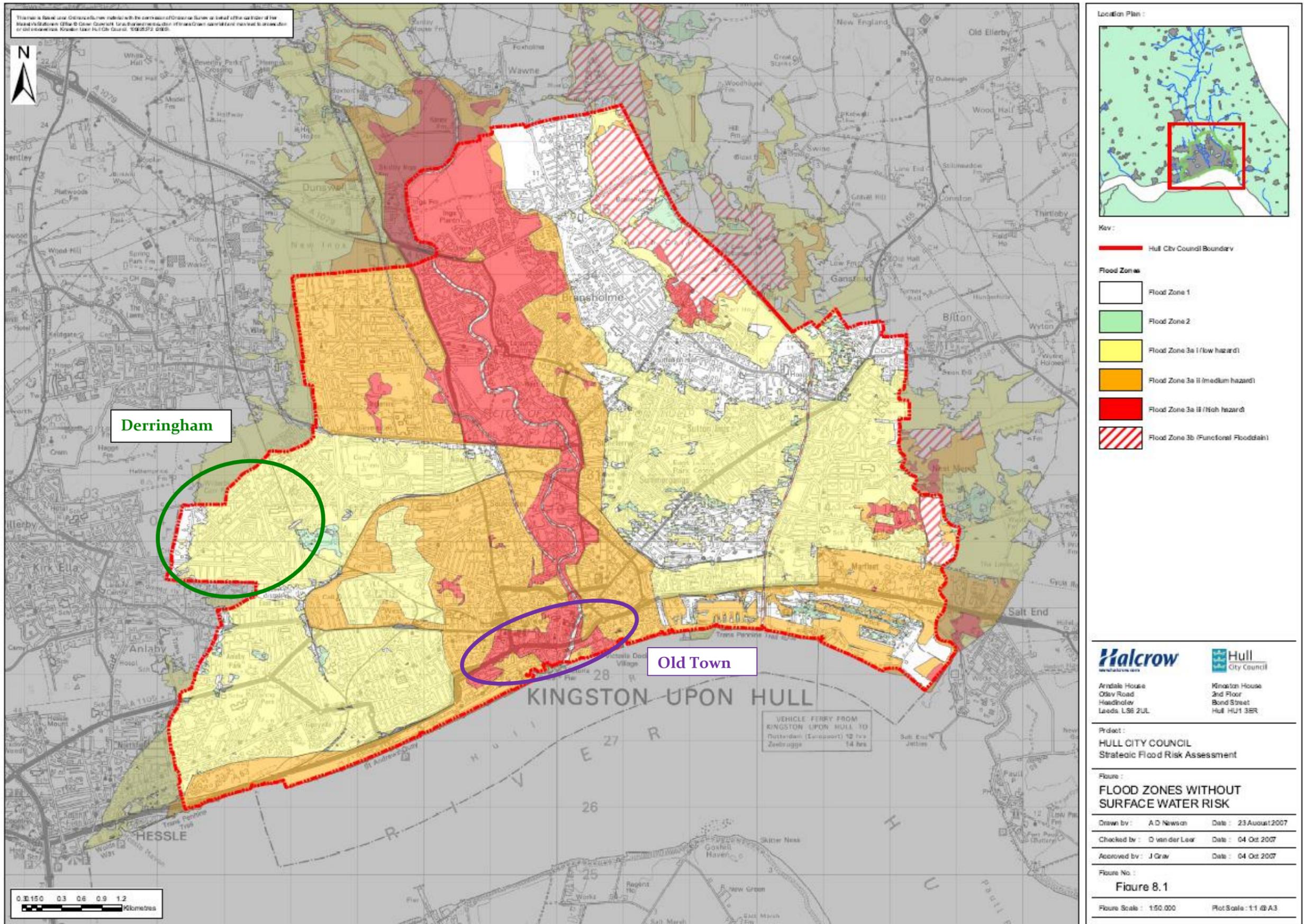


Figure 6-2 Strategic Flood Risk Assessment Map for Hull (Hull City Council, 2007)

As shown in Figure 6-2, in June 2007, Hull's Strategic Flood Risk Assessment considered the "old town" district of the city to be at high risk of fluvial and estuarine flooding, but the map did not reflect the pluvial flood risk (Hull City Council, 2007).

Due to the extremely widespread occurrence of flooding in 2007, it is difficult to pick out the areas which did not flood. However, one map produced by the consultants, Halcrow, for Hull City Council showing the 2007 flooding is tailored to show the areas worst flooded, circled in purple in Figure 6-3, the old town can be picked out as one of the areas least affected and Derringham, circled in green, very badly affected.

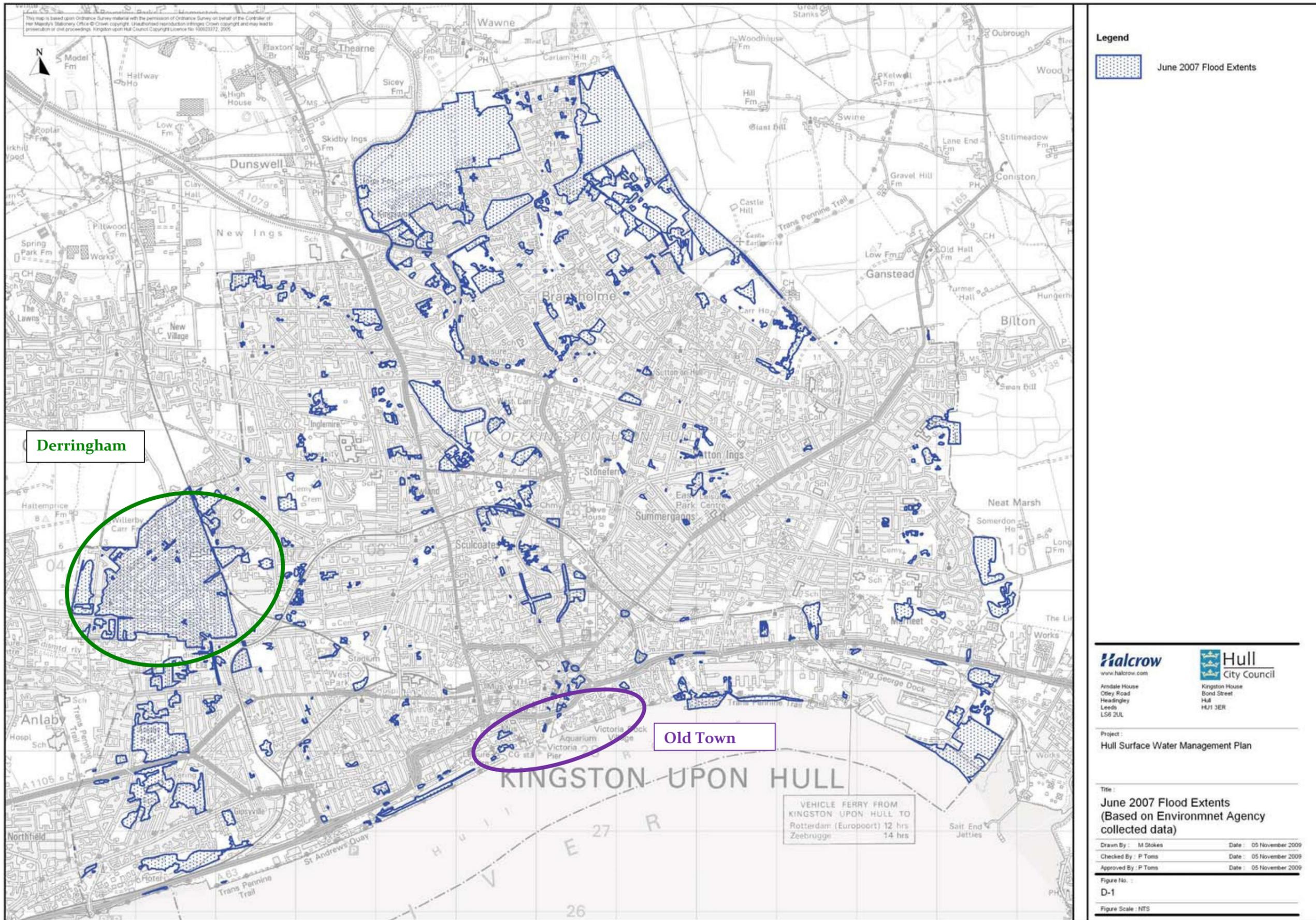


Figure 6-3 Map highlighting areas of Hull flooded in 2007 (Hull City Council, 2009c)

The maps provide a visual representation of the way in which flood risk policy was focussed on fluvial and tidal risks rather than vulnerability to pluvial flooding, but this analysis was also supported by evidence from interviews in which an Environment Agency Manager described the events of 2007 as:

“quite a shock” ... “that suddenly so many properties could be flooded but not as a result of a tidal or fluvial instance” (Environment Agency Officer, GAI, interview 2010, pg 1).

As discussed in Chapter 5, following the 2007 flood there was huge public outcry both nationally and particularly in Hull, which led to a national enquiry, The Pitt Review, and a local investigation in Hull, by an Independent Review Body.

6.2.1 COMPOUNDING VULNERABILITY

There are two instances in which risks such as from pluvial flooding can grow unnoticed, compounding the vulnerability of the population; firstly, when the focus is elsewhere on other risks such as fluvial and tidal flooding, and at other times, seemingly counter intuitively, when risk control measures are put in place, as discussed in the genealogy of flood risk in Chapter 4. As discussed in the literature review, this has been referred to in a number of ways by different people; Gilbert White (1945) described it as the “levee effect”, Parker (1995) used the term the “escalator effect” and Rutherford Platt (1999) defined it as the “moral hazard”. Interviewees in this study remarked on the difficulties they had maintaining an awareness of flood risk once flood defences were in place:

“you’re trying to educate people to have a flood plan to keep their possessions, their key documents in a sealed plastic bag etc. It makes it difficult... you can say ‘listen you are at risk, there are these defences here, but you still need to make sure you prepare because these things could fail.’” (Local Planner, LAO 10, interview, 2010 pg 5).

This quote indicates that people today do not understand the flood risk management properly. Since this has not always been the case and earlier chapter have shown how people used to live with flooding, much lay knowledge about flood risk has been lost. This loss of lay knowledge has been observed across a range of policy spheres; one author goes so far as to say that lay knowledge is “partial and fragmentary” (Burgess, 2004: pg 302). The absence of good public understandings of flooding means that people are less likely to takes steps to make themselves more resilient and therefore more vulnerable to the risks (Wisner *et al.*, 2004).

6.2.2 THE PLUVIAL FLOODING KNOWLEDGE GAP

When a disaster occurs it is easy to write it off as an anomaly, as one interviewee did, saying “*it was unavoidable, unforeseeable*” (*Senior Local Councillor (LAM 6) interview (2010 pg 8)*). However, taking this perspective could mask the reality of the way in which the hazard was produced, not as a completely unknown “natural” event, but as a product of the vulnerabilities created by the system.

6.2.2.1 FRAGMENTATION

Under the neo-liberal system, which has sanctioned privatisation and large scale division of functions and responsibilities, flood management had become fragmented in Hull. This system relies on the theory of reductionism and an associated faith in the aggregation of knowledge. Although reductionism is an informative means of understanding systems according to their constituent parts (Elster, 2007), there is a simultaneous need for perspectives of the whole (O'Connor and McDermott, 1997; Flood, 2006), ideally informed by those with both expertise and experience. Modern flood governance has been characterised by the move from a government managed system to governance beyond-the-state with the inclusion of more actors and organisations at various levels included in the process, taking over specific duties in order to streamline the decision making process, play to the expertise of the organisations involved, reduce the pressure on state budgets and by including more actors, make the process more inclusive and democratic. However, as the role of the state has been rolled back (Jessop, 1994), many interviewees in this study described gaps in the governance framework that have appeared potentially due to the lack of leadership and strategic overview of the flood risks facing the area as a whole. For example, the following quote describes the way the focus of flood governance shifted in light of the events of 2007:

“before the floods, we were already working very closely with the Environment Agency, but what changed since 2007 was that a lot of our focus was on dealing with risks from the River Hull of a fluvial nature and risks from the River Humber of a tidal nature, but then we had over 8000 properties that were flooded just from rainfall. None of our records showed that we had a risk from surface water prior to 2007 so what that led us to deal with is to look a lot more closely at the use of impermeable surfaces to reduce run off.” (*Senior Local Planner, LAO2, interview 2010 pg 2*).

In particular what becomes clear in this quote is that historical precedence has shaped the working relationships of those involved with flood governance and in turn the

responsibilities and the experience of those organisations has shaped the risk agenda. Hull City Council has plans to address the problems of run off by creating water storage areas on the outskirts of the city which will reduce the pressure on the drainage system (Hull City Council, 2009c).

One Local Councillor who was interviewed said that gaps in the flood governance system would always exist because funding was in such short supply and consequently wherever attention is focussed, the problems outside the spotlight would grow unchecked:

“what I think will happen is as time goes on, and if we don’t get another event, in another five or ten years, it will be a distant memory” (Local Councillor, LAM 6, interview, 2010 pg 3).

This quote also implies that it takes an event such as 2007 to expose the gaps in roles and responsibilities that have been created by the system.

6.2.2.2 PRIVATISATION

At the point of privatisation, responsibilities for tidal and fluvial flood risk were passed to the National Rivers Authority²⁰, which was superseded by the EA, whereas drainage responsibilities were transferred over to the private water companies, which created an institutional division of flooding responsibilities (Ofwat and Defra, 2006 pg 33). It is therefore very difficult for any one organisation to achieve a true overview of the water system, let alone try to devise and achieve the best management approach. Hull historically flooded in the areas closest to the rivers as a result of the River Humber overtopping its banks or tidal surges up the River Hull. As tidal and fluvial flood risk were and are within the remit of the Environment Agency, they became the primary partner for the local authority, which evidently pulled the focus of the city’s flood risk strategy towards tidal and fluvial risk (and consequently away from surface water and sewer flooding). Over time the Environment Agency developed a reputation as the “flood experts”; as one interviewee put it,

“you can accept the Environment Agency documents as being sort of gospel in terms of well they’re the experts.” (Local Planner, LAO11, interview, 2010 pg 8).

Unfortunately as a result of this transfer and compartmentalisation, the overarching strategic leadership role appears to have been lost; local authorities assumed that their

²⁰ This was because “private monopolies should not be made responsible both for making profits from essential services and discharging an environmental regulatory function.” (Ofwat and Defra, 2006 pg 32)

flood risk was in effect being managed by the Environment Agency, which is why, as mentioned previously many interviewees described the pluvial flooding in 2007 as “unforeseeable” (LAM6, interview, 2010 pg 8). The Draft Flood and Water Management Act made the following damning comments on the state of affairs:

“Current flood legislation is narrow both in its coverage and the tools it provides to manage the risks. The legislation covers only flooding from rivers and the sea. Surface run-off, which caused much of the damage in the Summer 2007 floods, is not adequately covered and neither is flooding from groundwater sources” (HMSO, 2009 pg 23).

The local council were put in a particularly difficult position at the time of the flooding as despite (or perhaps due to) the fragmentation of services, there is still a strong public expectation for the local authority to act as the lead local public service and care provider. However, they do not have the financial, institutional or legal capacity to force the hand of the private companies to increase the city’s drainage capacity.

6.3 THE DIFFICULTIES OF PLUVIAL FLOOD RISK MANAGEMENT

6.3.1 PLUVIAL FLOOD FORECASTING

The danger of explaining the 2007 Hull flood simply as an oversight of a fragmented, privatised system is the tacit implication that with improved governance arrangements and better regulation, the flooding could have been avoided. However, this is not necessarily the case.

Probabilistic flood warnings are particularly difficult to forecast and interpret (Tversky and Kahneman, 1974). Unlike tidal and fluvial flood forecasting and warnings, which as the following interviewee describes, are based on trigger points taken from real time data, pluvial flooding is intrinsically linked to weather forecasting and therefore probabilistic forecasting:

“...we’re looking at how we could provide warnings for surface water flooding but it’s probably always going to be quite difficult and produce probabilistic warnings. So we might be able to give people warnings of ‘tonight there’s a 50% chance of this much rainfall and there’s a 20% of that causing flooding to you.’ It’s going to be quite a difficult thing to interpret. I think the Met Office is always being accused of getting it wrong” (Environment Agency Manager, GA 2, interview, 2010: pg 8).

This quote refers to the difficulties that the public will face in interpreting probabilistic flood warnings, but research has shown that these problems with interpretation also extend to experts (de Elia and Laprise, 2005).

Further compounding the difficulties of flood forecasting is the significant lack of information about the location, capacity and state of repair of drainage assets. Hull City Council Officers admitted during interviewing that the city's drainage infrastructure was not fully known and this was reflected in the Drainage Infrastructure Map that was drawn up in 2008 which is marked up with comments such as "Check if outfall is still here" and "Check" (Hull City Council, 2007). This appears to be in line with the national picture as according to a survey in 2008, there were no local authorities at all who claimed to have assessed all of the assets, owned by all parties, in their area (Defra/LGA, 2008: pg 4). The probabilistic nature of the forecast and warning coupled with the fact that there is so much missing data perhaps explains why "*there aren't currently any warnings for surface water flooding in this country*" (Senior Local Planner LAO3 interview pg 12).

6.3.2 ACCEPTABLE LEVELS OF RISK

Flood modelling and forecasting can produce probabilities of the occurrence and severity of future flood events, but these predictions are not in themselves implementable policies. In order to formulate policy, decision-makers must agree on publically acceptable levels of risk that are within their financial capacity (Roberts, 2004). Despite national guidelines, there are local variations in the acceptable levels of flood risk across England and Wales. In 2006, the Environment Agency's "Extreme Flood Outline Maps" aimed to set out a national standard of what was to be considered "high", "medium" and "low" risk of flooding excluding the effects of defences and plot these areas on maps which would be publicly available. In Hull, this broad brush painted the whole area as a danger zone and created controversy at the local level as by the government's mandate, the local authority should discourage any further development in their area. There are a number of national firms, such as Reckitt Benckiser (household cleaning products), Smith and Nephew (pharmaceuticals), Seven Seas (healthcare supplements) and Comet (electricals) with major operations in Hull. Under the new guidelines these companies would be discouraged from expanding their existing sites and new companies would be unable to set up new operations in the city. The implication for future investment and the viability of the city as a whole would be severely in question. In light of this, Hull City Council carried out its own flood risk assessment which created subcategories of risk in an attempt to safeguard the future of the city. As one local planner put it:

“with good design and good construction and good planning, there’s no reason at all why the city can’t continue to develop and thrive” (Local Planner, LAO 10, interview, 2010 pg 6).

In effect, in creating a new map, the local planners were questioning the acceptable level of risk that had been set by the government, but which they did not consider appropriate for Hull. Another senior local planner stated clearly: *“if the risk is designed out, why should we have to build elsewhere?” (Local Planner, LAO 2 interview, 2010 pg 3).* Such sentiments are problematic as it is characteristic of an over simplistic approach which conceptualises flooding as a problem to be “overcome” and gives the public a false sense of security, thereby producing vulnerability to flood risk. As an Environment Agency Officer put it, *“what people continue to ignore is that if you improve the flood defence they will still be at risk” (GA1, interview, 2010 pg 12).* Negotiating acceptable levels of risk is extremely controversial and constantly under review, especially in light of previously unforeseen risks such as surface water, but it is important that it remains clear that the scientific research concerns improving the balance of probabilities rather than eliminating a problem.

6.3.3 COMMENSURATING UNCERTAINTY, INTEGRATING SCIENCE INTO POLICY

Decision-makers are often forced to make decisions about funding and policy often in very short spaces of time, which does not leave much space for exploring the technical uncertainties generated by scientific research (Roberts, 2004). Directly or indirectly, questions over factual certainty and consequently, the issue of uncertainty were raised on a number of occasions by interviewees from all parties involved in flood governance in Hull. In particular, there was very little room for uncertainty in the decision making framework, and therefore there was an expectation that uncertainty should be something that could be removed or quantified. One interviewee stated:

“the experts, the professionals, the academics, the engineers – they need to tell me what needs to be done to stop this happening again” (Senior Local Councillor, LAM1, interview, 2010 pg 2).

Such an approach leaves little room for uncertainty, varying probabilities and a range of policy options to be explored. Instead, it suggests some lack of understanding about how environmental problems can be approached and the way that some people involved in flood governance perceive nature. As noted in Chapter 2, this has moved forward in academic terms, many scholars do not use the term “natural disaster” any more. Rather

than natural phenomena, disasters are considered to be socially constituted. There were some instances during the interviews carried out in this study in which interviewees made less reasonable demands, such as political leaders who demanded “*a cast iron guarantee*” (*Emergency Planner, LAO, 6 interview pg 10*) that there would be no repeat event, but most accepted that there remains a certain degree of scientific or factual uncertainty that cannot be controlled.

A disjuncture somehow persists between the policy makers’ understandings and their practices; despite understanding the issues of uncertainty, they continue operating within a system which only seems to either quantify or eliminate uncertainty (Roberts, 2004). Policy-makers operating within a modern neoliberal system uses cost-benefit analyses, a form of utilitarianism (see Mill, 1882 and Bentham, 1789) to make decisions and therefore it becomes clearer why they demand quantifiable options to fit this approach. This also allows decision-makers to avoid blame in the event of a disaster because they can show how and why they took a decision without having to take responsibility for that decision. As one local planner put it:

“we just want to make sure that our science, all the evidence is considered to be robust by the experts. They are the experts on this so as long as they’re happy with it then we’re happy with it. That’s how it works.” (Local Planner, LAO 12 interview, 2011 pg 7).

6.3.4 MANAGING PUBLIC EXPECTATIONS

There was a strong understanding amongst the organisations involved in installing flood defences that they had a role to play in managing the expectations and perceptions of the flood defences. The media is the main source of information for the general public and as a result the media has a huge potential to influence public opinion and a large role to play in managing perceptions and expectations (Slovic, 1986). Governments recognise this and use the media to relay public broadcasts, but there are still many problems with low public awareness (ibid.). An Environment Agency Regional Manager described the way that people think “*well I’ve got a flood defence at the bottom of my garden so I’m OK*”. He goes on to say:

“but actually if you weren’t at risk you wouldn’t need a flood defence. People tend to look upon flood defence as a finality so that’s why we’ve moved from defence to management” (Environment Agency Manager, GA1 interview, 2010 pg 5).

This quote highlights the way in which a change in the language used by government from defence to management represents an attempt to address the problems created by the public feeling overconfident about their level of risk when flood defences are in place and recognising the limitations of government intervention. This is interesting when considered in relation to the previous chapter in which there was some discussion as to the motivations for changing from the language of “flood defences” to “flood risk management” as part of a change in policy and practice. This quote implies that as knowledge and understandings of the social implications of engineered interventions improved, this may have contributed to the shift to a new paradigm.

The evolution of the general public’s perception of flood risk according to the actions of government policy was raised by interviewees in other ways as well. One interviewee described his perception of the effects of losing the visible watercourses around urban areas:

“It rains and it goes down the drain whereas it rains, it goes in that stream... ‘oh I’d better keep an eye on that stream,’. You can’t keep an eye on what you can’t see and that’s a major problem for us. It was a major problem for me in trying to get people more flood-aware. ‘I haven’t got a problem, I don’t live near a water course.’ ‘Well actually, you probably live very near a water course, it’s just that you can’t see it.’ ... How do you make people aware that they’re at risk when they can’t see the risk? It’s there beneath their feet.” (Environment Agency Regional Manager GA 1 interview, 2010: pg 9).

Removing open watercourses and sewers in cities was a government policy between 1792 and 1828 driven by a desire to improve living standards in urban areas in which watercourses were primarily perceived as sites of disease and danger (Fisher *et al.*, 2005). Whilst the danger of disease and accidents has certainly been reduced, the effect on the national psyche of losing the visual reminder appears to have contributed to a false sense of security and consequently a corresponding increased vulnerability. This assertion was exemplified by the following quotes

“We now live in a society where central heating, leather furniture, carpets and so on are all part of modern everyday living. Not so very long ago stone floors and other circumstances meant that people were more tolerant.” (Environment Agency Regional Manager, GA 1, interview, 2010 pg 16)

The quote describes the way in which modern society has lost some resilience to the natural hazard posed by flooding. The interviewee used the example of modern central

heating, which only started to be used after the Second World War, was installed in 25% of English homes in 1971 and by 2005 existed in 91.5% of homes in England (Utley and Shorrocks, 2007). These devices are generally powered by electric and/or gas and national guidance recommends that all boilers are replaced after a flood event (National Board of Boiler and Pressure Vessel Inspectors, 1993).

6.3.5 PLUVIAL LEGISLATION AND MINIMUM STANDARDS OF PROTECTION

As a result of the way in which the system of flood governance has historically focussed on tidal and fluvial flooding, legislation for pluvial flood risk management is sparse. There are no existing minimum requirements on water companies to maintain a given drainage capacity comparable to the 1 in 100 year mandatory minimum standard of protection that exists for fluvial flooding (Coulthard *et al.*, 2007: pg 44). As a local planner described:

“There’s nothing that says you’ve got to improve up to this standard of drainage capacity... there’s supposed to be a thirty year drainage capacity, that’s supposed to be what the sewers take, but that’s not a statutory requirement, it’s an industry standard. I’m not aware of if it drops below that thirty year standard that there’s anything the regulator can do to say you’ve got to improve that because it’s only a twenty year and it should be a thirty year standard” (Council Officer, LAO9 interview 2010: pg 8).

Several interviewees stated that the addition of a legal obligation would be a valuable tool with which to manage flood risks, but at the same time described how problematic it would be for a national standard of acceptable risk to be determined;

“I think it would be useful to have a statutory requirement, I’m not sure what that would be to be honest because a one in thirty doesn’t help with the extreme scenarios but of course if you design something solely for the extremes, then it puts your cost up significantly” (Local Council Officer, LAO9, interview 2010, pg 8).

Devising a legally binding standard of protection is further complicated as in a recent survey 96 per cent of local authorities admitted that neither they nor the private water companies had mapped their combined drainage assets in full (Defra/LGA, 2008: pg 4). A representative from Yorkshire Water described the problem in Hull:

“What we need, and the reason that we’re moving on with drainage area plans, is at least a very clear understanding of the entire city’s structures and interactions and how it works” (Yorkshire Water Officer PC1 interview 2010: pg 4).

Until such a time as this information is known, it is almost impossible to know what standard of protection the drainage network is currently offering and therefore to gauge the pluvial risk facing Hull. Furthermore, even if a standard could be agreed, due to the dynamic nature of the water system, it would be extremely difficult to enforce:

“I think they do need to set a minimum requirement that has to be maintained but the policing of that is quite difficult because how do you know when the thirty year standard isn't being met?” (Local Planner LAO9 interview 2010: pg 8).

The Independent Review that was carried out in Hull after the 2007 flood also supported this view that the regulator should set mandatory limits for pluvial flood risk (Coulthard *et al.*, 2007), but there is no evidence to date (in interviewing or policy documents) which indicates that these will be put in place in the near future.

6.3.6 FINANCE

Flood risk management cannot be pursued without at least some financial backing and unfortunately in the current climate of recession and austerity, as the state shrinks in all its faculties, there are more questions being raised about the amount spent on infrastructure projects such as flood protection, especially because flood risk management does not necessarily produce tangible results. As one interviewee put it, *“you can't point at a street and say look that's not flooded. It's not dramatic enough.” (LAMi interview pg 10).* This quote highlights the fact that funding is hard to secure for mitigation or preventative measures to address pluvial flooding; local authorities can compete for funding for local schemes from national government or apply to the Environment Agency to undertake large infrastructure projects in their area. However, funding tends to be easier to secure in a time of crisis – national funds are more forthcoming under political pressure (Penning-Rowse *et al.*, 2006). As a local council officer put it: *“we really needed it [the 2007 floods] to push things through” (Council Officer, LAO3, 2010: pg 2).* There is a risk that this could give local authorities a disincentive to invest in flood risk management as they know they will still be bailed out by national government in the event of an emergency.

A lack of financial capacity was cited over and over again in interviews as a major barrier to effective flood risk management, but it is difficult to assess how true this is in reality because funding is an easy target for people to blame when a problem has occurred (they're unlikely to say “yeah, I made some really bad decisions”!). However, this diverts the conversation very quickly and it shifts the blame to the allocators of funding thereby making it a political argument about prioritisation. By blaming lack of funding for any

failings in flood risk management, an interviewee avoids admitting there could be an institutional problem when this may be the case. There is every possibility that the funding that is available could be spent more wisely and that the real barrier to effective flood risk management is institutional inadequacies, therefore an interviewee citing a lack of funding as a problem is not necessarily indicative of a real limitation on their capacity.

6.4 THE FUTURE OF PLUVIAL FLOOD RISK MANAGEMENT

The 2007 flooding in Hull highlighted the issues around pluvial flooding in the city. It also demonstrated the gaps in policy and practice nationally. Whilst steps can be taken at the local level to try to manage some flood risks, there is a clear requirement for a national policy framework within which local actors can operate as according to one Environment Agency officer, “...with climate change ... it will happen again” (*Interview GA1, 2010: pg 7*).

It should be noted that the local authority, Hull City Council, plan to store water on the fringes of the city in order to relieve some pressure on Hull’s drainage network (see Hull Aqua Greens project, 2009) using a combination of money drawn down from the Environment Agency and funds from their own budget. Hull City Council also commissioned an updated Strategic Flood Risk Assessment in light of the 2007 flooding to include the pluvial flood risk in the city’s zoning map as discussed in Chapter 4. The areas marked in black were upgraded in their flood risk status after 2007 (no areas were downgraded).

Furthermore, Yorkshire Water and Hull City Council representatives both stated during interviews that they were undertaking work to map out all the drainage assets in and around the city in order to be able to model pluvial flooding in the future and improve pluvial flood risk policy.

6.4.1 INSURANCE

Currently the primary mechanism for managing flood risk universally is through a system of private insurance. England is in the unusual situation of having had a private flood insurance arrangement for over half a century. A “Gentleman’s Agreement” was set out in which private insurers gave a “guarantee to government that for residential properties it would not refuse to offer flood insurance for any residential property, no matter what the risk” (Crichton, 2002: pg 127) on the basis that the government would maintain flood defences to a reasonable standard.

This system has operated reasonably successfully for a number of years. While insurers have agreed to provide cover, insurance premiums have become prohibitively high in some areas, rendering those who cannot afford insurance even more at risk (Whyley *et al.*, 1998). The Guardian newspaper (2012a: *pg 1*) reported that “many householders are struggling to get insurance, and others are offered cover at a price they cannot afford”. This trend has been observed in Hull since 2007 and was described by one local resident:

*“My insurance premiums have gone up, but they haven’t all gone up. It seems almost random, but the reason given is the floods. I can’t even get insurance cover from some; they say ‘was there water in the street?’ and I say ‘yes, but not in the house’ and they say ‘I’ll have to stop you there.’” (Local Resident, CR5, 2011: *pg 8*)*

As this quote indicates, not only have householders who were flooded found their insurance premiums rising, but because insurance companies base judgements about flood risk on post code areas, some residents found that their premiums were becoming prohibitively high despite that fact that they had not been flooded in 2007. This was supported by newspaper articles which reported the residents in Hull had been refused insurance because their “postcode was in a high-risk flood area” (Guardian, 2012a: *pg 1*). Hull appears therefore to have moved “beyond the insurance limit” (Beck, 1996: *pg 31*), meaning that the model of insurance is no longer economically viable with the level of risk as it stands. Furthermore, the Gentleman’s Agreement expires and will be subject to renegotiation in 2013 which will bring flood insurance issues to the forefront of the political agenda (Crichton, 2002).

In effect, the private insurance companies will become the *de facto* managers of flood risk as properties at high risk of flooding will be subject to higher premiums which will over time increase awareness of flood risk, making these areas less desirable and devalue property. This system of privatised risk management can be described as an individualistic model of insurance, meaning that individuals pay premiums according to their level of risk (O’Neill and O’Neill, 2012). There is scope for the government to pursue a model of flood risk insurance in which there is some cross-subsidisation of those at high flood risk by those at lower flood risk (*ibid.*). This could be achieved under a privatised insurance system, either if accompanied by a government agreement (akin to the existing Gentleman’s Agreement) or if enforced by government regulation and legislation, though the latter is likely to be politically sensitive.

6.4.2 DRAINAGE INDUSTRY REGULATION

At the point of privatisation the government handed over control over the drainage system, and consequently transferred the risk management responsibilities, to the private water companies. There is very little (if any) financial incentive for the private water companies to reduce pluvial flood risk. The only remaining mechanism available to the government to enforce pluvial flood risk management is through regulation.

In England and Wales there are three regulatory bodies for the water and sewerage industry; the main regulator is the Water Services Regulation Authority (Ofwat), whose role is to manage prices for consumers as well as some service quality functions such as customer complaints and leaks. The second regulator is the Drinking Water Inspectorate who are tasked with maintaining the standard of potable water supply so that it is safe and clean for consumers. Finally, the Environment Agency serves as the environmental regulator, governing the distribution of abstraction and discharge licences and managing main rivers.

There is no specific regulator to manage flood risk. Therefore as the main regulator of water, this responsibility falls to Ofwat. However, Ofwat's power over the water companies was brought into question by interviewees in this study who said: *"I don't think they've necessarily got the necessary teeth"* (Local Government Planning Manager, LAO 9, interview, 2010 pg 11). This implies that Ofwat might want to force the private water companies to make changes to reduce flood risk, but they do not have the legislative or institutional capacity. However, there may be a more fundamental institutional barrier for Ofwat as its primary function is price regulation. It conducts 5 year price reviews (the current period is 2010-2015) in which the private water companies apply for price rises justified by investment proposals. As one interviewee put it,

"if you want Yorkshire Water to seriously invest and improve its infrastructure, you don't want a regulator whose top priority is ensuring the prices are kept down... say if water bills increased by 50% ... Yorkshire Water could suddenly invest let's just say an additional £50-60 million into the city's infrastructure, well that's got to be a positive but I think the way Ofwat are set up, they're never going to endorse that level of increase – it's more like 'hmm 5% are you sure about that, do you really need to make these levels of investment?' And that's a bit of a concern, which I don't think is a fault of Ofwat, it's just that's what their responsibilities largely are." (Local Government Planning Manager, LAO 9, interview, 2010 pg 11).

In order to truly begin to manage flood risk in Hull through regulation, things need to change because as the following interviewee says, flood risk is only a subsidiary concern of the current objective of the regulator and therefore suffers whilst other organisational objectives are pursued.

“A drainage infrastructure fit for the twenty-first century would mean Ofwat’s terms of reference would need to be altered to maybe reflect that [minimum standards of flood risk] as a top objective... and I think the process doesn’t enable that type of debate/discussion to really come out and unfold at the moment.”
(Local Government Planning Manager, LAO 9, interview, 2010 pg 11).

There is therefore perhaps some scope for a regulatory authority which takes on responsibility for assessing a minimum standard, implementing it and monitoring it in the future.

6.5 CONCLUSION

Flood knowledge is traditionally experiential and policy, perceptions and understandings are based on previous experiences of flooding. This chapter demonstrated the way in which flood knowledge grew up in the context of land drainage and urbanisation and focussed on the experiences of fluvial and tidal flood risks which were being managed to a socially acceptable level. The 2007 flood event as experienced by the city of Hull was an example of the way in which the historical trajectory of fragmentation and privatisation which the system had taken had left gaps in knowledge, policy and practice. This created a window of opportunity for policy change to be enacted. However, even when the risks were recognised and efforts made to address the institutional problems, further difficulties such as the complexities of generating and interpreting probabilistic pluvial flood forecasts remain. In this way, the state of knowledge at the time of a crisis influences whether or not a policy window can be exploited or not at the local and national levels.

In light of the numerous challenges facing pluvial flood risk management and the squeeze on the public purse in the current economic climate, the question that remains is what constitutes an acceptable level of pluvial flood risk? What are people willing to live with in terms of risk or taxation to reduce risk and how can that be achieved? These questions can only be answered by politicians as they are ideologically driven and they represent what Weingart (1999) refers to as the “politicisation of science”. As MacFarlane

(2003: *pg 789*) concludes, “scientific knowledge cannot be separated from politics and associated policies. Rather, they coevolve in response to each other”.

The national policy options put forward in this chapter focus on flood risk insurance and government regulation of private drainage companies. Ideally, in the future, as technical knowledge and data is generated and each of the issues highlighted in this chapter are addressed, acceptable levels of pluvial flood risk can be agreed and a cohesive strategy for pluvial flood risk put in place. This will again be based on experiential knowledge, this time of pluvial flood risk. Therefore, perhaps, policy based on “reflexive practical knowledge” (Beck *et al.*, 2003 *pg 17*), which is more inclusive of unorthodox methods and sources of information and consequently more “locally sensitive” and “temporally contingent” (Clark and Murdoch, 1997: *pg 40*), would be best suited to flood risk policy-making. The system is so complex that precautionary and pre-emptive policy would be too expensive and restrictive to implement. However, this does not preclude the need for the government to at least attempt a fundamental review of holistic flood risk in the UK in order to try to assess the potential existence of other invisible risks.

7 CONCLUSION

Hazards only exist in flood adaptation and mitigation strategies if they are perceived to pose a risk, therefore the framing of flood risk and how this changes under different flood regimes becomes central to understanding which flood policies are adopted. This research set out to examine the concept of *windows of opportunity* that open in the aftermath of flooding disasters in England and Wales (Penning Rowsell *et al.*, 2006). It has helped to shed some light on how the risk of flooding was framed in 2007 in the city of Hull and how this changed after 2007, revealing the emergence of a new risk of “pluvial” flooding. The study has also sought to explore the role of public engagement with local flood risk management and how this changes in the aftermath of a flood event.

The existing literature on windows of opportunity opening in flood policy in England and Wales examines flood events and policy between 1947 and the end of 2000 (Penning Rowsell *et al.*, 2006). This thesis used the case study of the 2007 flood event which had not previously been examined using this theoretical approach. Furthermore the existing literature focuses on nationally significant events and changes in national policy (Penning Rowsell *et al.*, 2006; Kingdon, 1984). This study re-examines the period from 1947 to 2010 at the local level, looking at the city of Hull, with the additional example of the 2007 flood event which was important both locally to Hull and nationally.

The overarching research question of this thesis is: What facilitates or forecloses the adoption of flood governance regimes and policy?

7.1 EMPIRICAL FINDINGS

The main empirical findings of this thesis are chapter specific and were summarised within the respective empirical chapters: “the role of flooding as an environmental crisis”, “public engagement with flood risk” and “generating flood knowledge and understandings”. This section will synthesise the empirical findings to answer the study’s research question.

Changes to national flood governance regimes and policy in England and Wales in the twentieth century are clearly linked to a flood event or events. Flooding in 1953 stimulated the building of North Sea flood defences along the East coast of England and flooding in 2000 prompted new planning guidance (PPG25) which attempted to provide

the framework for controlling floodplain development as a way of managing flood risks. This study showed that flooding in 2007 stimulated the development and implementation of the Flood and Water Management Act in 2010. This indicated that the environmental crisis presented by a flood event provides some sort of platform for reassessing flood risk and as a result this may open up a window of opportunity in which policy may change. However, there are a number of examples of floods, such as those in 1968 and 1978, which did not open this policy window. This led this study to consider the role of other factors relating to the flood such as the magnitude of the flood, how widespread it is geographically, the location of the event, the media coverage and the public perception of the event, all of which contribute to determining whether or not the flood is conceptualised as a crisis and can then be used to leverage changes in flood governance and policy.

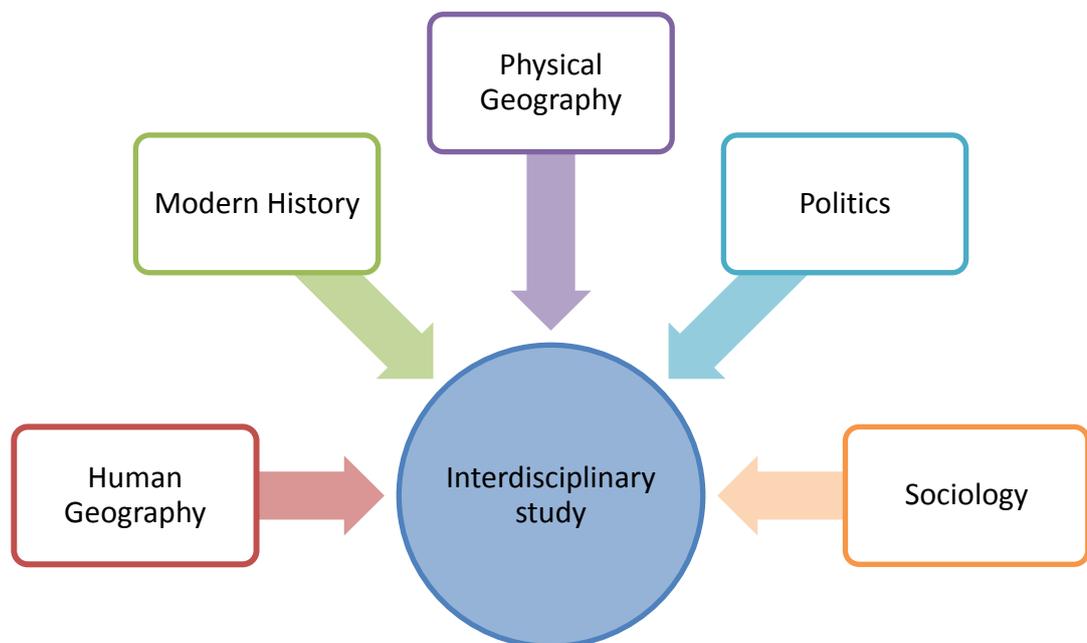
The 2007 floods presented an interesting example of a widespread, high magnitude flood, affecting politically sensitive areas of the country, receiving huge media attention and perceived by the public to have been a disastrous event. In Hull, it was rationalised as a new and unforeseen type of flooding by local flood governors which subverted many accusations of blame levelled at them by the public because the authorities were able to show that their assigned responsibilities were for tidal and fluvial flooding which had not presented themselves on this occasion. The government inquiry which followed the 2007 floods led by Sir Michael Pitt (2008) provided Hull and pluvial flooding with a national platform. As a result, the political discussion was focussed on the new risk of pluvial flooding and the example of the 2007 flood was mobilised to support changes to policy and practice introduced by national government that made it possible for local officials in Hull to address pluvial flood risk in their area. There is no evidence to suggest that changes were underway to address pluvial flood risk in Hull before 2007, despite the local flood authorities having a reasonably good understanding of the other flood risks facing the city from tidal and fluvial sources. For example, Hull City Council's Strategic Flood Risk Assessment did not take account of pluvial flood risks and had to be altered after 2007. The national political impetus for change provided the funding as well as the legislative and institutional framework for change to be enacted at the local level.

7.2 REFLECTIONS ON INTERDISCIPLINARY RESEARCH

A word cloud created using the words in the introduction chapter of thesis gives an indication of the broad scope of the study and the wide range of disciplines used to inform the different aspects of this research.



Silo working within disciplines has widely reported disadvantages and this thesis examined the disadvantages of engineering as the dominant discipline in flood management which created risks associated with dependency on flood defences. Modern flood risk management has been characterised by a transition to a more holistic approach to the problem which takes into account the local social and economic vulnerabilities of the populations at risk. Similarly, this thesis approached the study and analysis of flood risk management in a holistic way drawing on literature from many disciplines.



This study is primarily situated within the human geography discipline and specifically contributes to environmental governance theory along with theories of knowledge co-production in science and technology studies. There was also a strong element of modern history as the study explored the longitudinal context and trajectory of modern flood governance. Physical geography was at the core of the technical aspects of the thesis and this thesis' analysis of the new emerging knowledge of surface water is a contribution to the epistemology of physical geography. This research made a strong contribution to the politics literature through the analysis of different models of democratic engagement, policy influencing and advocacy. Finally, the aspects of this thesis which focussed on the behaviours of communities, power and engagement contribute to the sociology literature. For the outlined contributions to several different disciplines, this thesis is identified as an interdisciplinary study.

7.3 THEORETICAL IMPLICATIONS

In light of the empirical evidence, the theory of how policy and governance regimes change and specifically the theory of windows of opportunity needs to be revisited in order to understand whether this holds in the example of the 2007 floods and at the local level.

Penning Rowsell *et al.* (2006) observed a pattern in the way that flood governance and associated policy changed in England and Wales after the end of the Second World War. They identified two periods of accelerated policy change: from land drainage to flood defence and then from flood defence to flood risk management, and then they drew causal links between these regime changes and flood events in 1947 and 1953, and 1998 and 2000 respectively (Penning Rowsell *et al.*, 2006). The evidence of the 2007 flooding presented in this thesis supports the theory that a flood can facilitate a change in flood governance regimes and policy at the national level. However, this thesis also noted the occurrence of flooding at other times which did not provide the space for policy change, which indicates that an environmental crisis such as a flood can provide the *opportunity* for a change in policy, but that this opportunity may not always been exploited.

The concept of policy windows which facilitate accelerated changes to be enacted was explored by Kingdon (1984) and Penning Rowsell *et al.* (2006) at the national level. This study re-examined the applicability of this theory to the local level, looking specifically at Hull in the period between 1945 and 2000 and then going on to examine the implications of the 2007 flood event. This study showed that a flood event in Hull in 1921 led to the introduction of new local policy in 1925 to strengthen flood risk management locally.

There was no nationally significant flooding at this time and no national change in flood governance or policy. This indicates that flooding at the local level can provide the opportunity for flood policy changes at the local level. However, since the 1930 Land Drainage Act, flood policy has been primarily directed by national government and as a result the relationship between flood governance regimes nationally and locally has become inextricably linked (Scrase and Sheate, 2005). As a result, Hull was subject to a change in policy from land drainage to flood defence despite not being directly affected by the flooding in 1953. Furthermore, Hull experienced flooding in the 1960s and despite local officials campaigning to national government for changes to be made locally, there is no evidence to suggest that an action was taken. Finally, Hull was significantly affected in 2007, along with many other parts of the UK; the event became nationally important and there was a change in flood policy. When viewed in light of the shift in strategic and directive responsibility for flooding from the local to national level in 1930, the example of Hull's flood narrative indicates that local flood risk management has become bound by national flood strategy because that is where funding and strategic direction are now driven from.

This thesis focussed on the outcomes of the macro processes of governance – the development and implementation of flood risk policy, but this was driven by strong individual actors and major changes to institutional structures. The roles and responsibilities of various organisations have undergone enormous changes since the Flood and Water Management Act was introduced and this thesis provided insights into the way in which the governance system has been redefined to manage flood risk more effectively. Various different actors were discussed in detail in the empirical chapters of this thesis: officers in the local authorities, local councillors, community groups, the Environment Agency, central government and private water companies. Whilst it is useful to break this down for analytical purposes, these groups often work together and this is something which is further encouraged by the Flood and Water Management Act. This fits with the thrust of environmental governance literature which advocates partnership in order to draw upon the resources of the different organisations and improve their collective adaptive capacity. One of the fundamental principles of good governance is polycentricity so that multiple voices are included and power is not wielded unilaterally by one actor. This is characterised by consensus, democratic engagement and public buy-in. The difficulty with this system is the practicality of flood risk management as the processes become inordinately slow and complex and people can feel disengaged as they feel they do not have sufficient power to achieve good flood risk management. The empirical evidence in this thesis demonstrated the need for

partnership working as there has been a significant loss of flood risk management expertise across the flood governance network, and also observed the key risk associated with partnership working - slow, ineffective processes.

Pluvial flooding has become the risk or enemy which grew unnoticed *within* the system of flood governance, while attention was focussed instead on tidal and fluvial flooding, which are more definable and better understood. This shift in understandings of different types of flood risk has huge implications for policy-making.

7.4 POLICY IMPLICATIONS

Pluvial flooding, the *unknown enemy*, requires a different approach to manage the public's risk from traditional forms of flooding such as tidal and fluvial. These risks are more visible and tangible, arising for example from a river overtopping its banks, an occurrence which is understood and therefore a risk that is implicitly established in public perceptions. By contrast, the locations in which pluvial flooding occurs is influenced by different factors, such as the drainage infrastructure or simply the build-up of detritus and debris in kerbside drains and it can be sensitive to relatively small changes in conditions, creating unexpected localised variations in modelled flood risk scenario maps. As a result, it is much harder for the general public to see the relationship between their local environment and flood risk. The difference in perceptions of pluvial versus traditional flooding, means that people are much less likely to engage in proactive, precautionary public engagement on pluvial flood risk management, and the responsibility will rest largely with Lead Local Flood Authorities.

In light of the unusual nature of pluvial flood risk, local authorities will be forced to make some difficult decisions regarding the way that they manage pluvial flood risks in their area. The most important of which is whether to attempt to manage the risks of an area as a whole or to attempt to protect individual buildings. In the case of Hull, the costs involved in upgrading the drainage infrastructure of the city as a whole would be very expensive – potentially prohibitively high. Pragmatically, therefore the council might consider taking steps to protect the most important areas or buildings in the city, it's "critical" infrastructure. However, there would be further difficulties defining the buildings that are most critical to the functioning of the city. Whilst there are some buildings such as hospitals, transport systems, electricity and water supply networks and schools which would be high on the list, making decisions to protect these buildings whilst leaving others more vulnerable involves making value-judgements and prioritising

certain service buildings over others and indeed people's homes, which is likely to be problematic.

This thesis did not aim to generate solutions to the problems facing modern flood governance, but to explore in greater depth than before the way in which flood governance has evolved at the local level in the context of both the local socio-economic and political environment and national level policy. The aim of this form of analysis is to provide flood practitioners with the broader understanding of the way in which flood risk operates under the current governance regime.

7.5 RECOMMENDATIONS FOR FUTURE RESEARCH

This study did not focus on the impacts of the emergence of a new risk on livelihoods, but it would be interesting to examine the effect of the 2007 floods on house prices and livelihoods more broadly in Hull.

Further case studies which examine the interactions of flood events, policy windows, public engagement and flood knowledge and perceptions in different locations in England and Wales would allow for direct comparison with this study in the same national context. Furthermore, it would be interesting to examine the applicability of the theory of policy windows in other locations, such as Scotland which has a different flood governance system, but shares an overarching national political framework, and in international locations. The Netherlands, for example, would provide an interesting example of an area which shares some geographical characteristics with Hull – low lying drained land – but has a very differently organised flood risk management regime.

7.6 CONCLUSION

This research was prompted by the widespread flooding of 2007. The city of Hull experienced a new type of flooding that forced the city to reconsider its vulnerability to flood risk. Rather than falling off the political agenda, flooding is still a topical issue. Throughout this research there have been a number of flood events: in 2008 in Devon, south Wales and north-east England, in 2009 in the Lake District, in Cornwall in 2010 and 2011 and again, this year in September, people from north Wales to Northumbria experienced flooding after heavy rainfall. Only recently Hurricane Sandy made landfall on the Eastern seaboard of the USA and Manhattan Island experienced widespread flooding and destruction from high winds. The magazine Bloomberg Businessweek's

cover story takes up the story and attributes the event to anthropogenically influenced climate change.

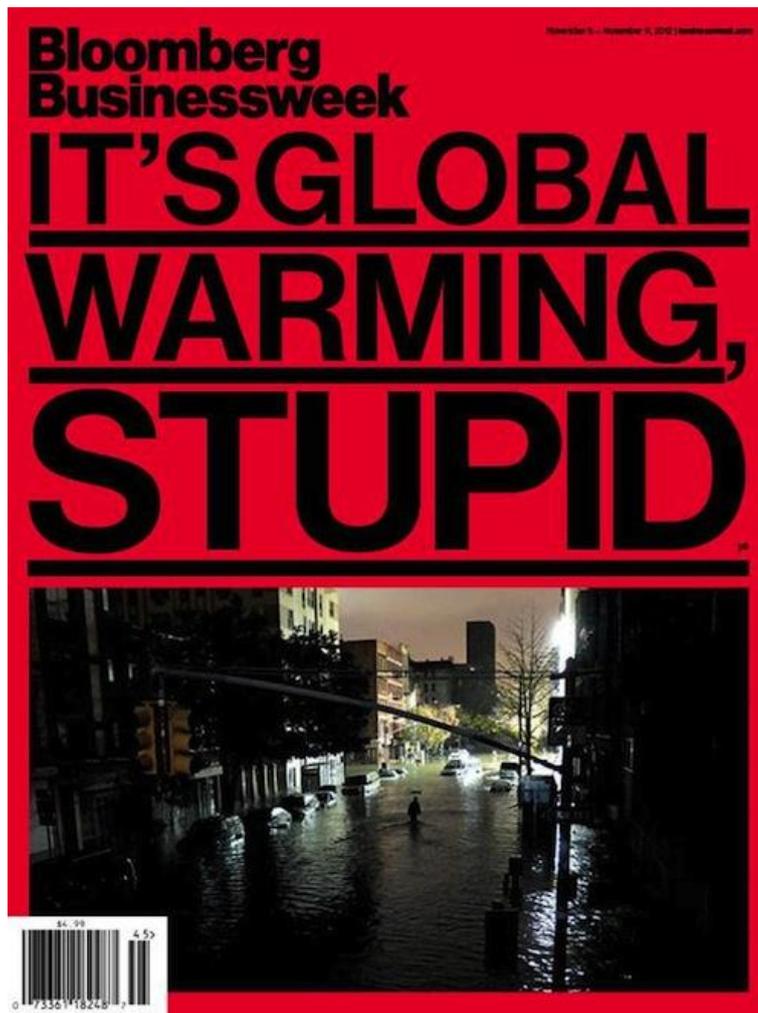


Figure 7-1 Bloomberg Businessweek Front Cover, 2nd November 2012

The headline is direct and visceral, articulating the connection between flooding and climate change in a way that reflects the magazine's evident frustration with public perceptions and understandings of the risks associated with climate change. One of the difficulties of climate change is that the size of the challenge is huge. This thesis focussed on a local example of flooding, but this sits within a broad context of climate change in which there are many "locals" and furthermore a lot of different issues connected to climate change which may manifest themselves in each place – heat waves, sea level rise, high intensity storms etc. When looking at the local level it can be useful to make the connection between a particular localised event and a big concept like climate change. As one local councillor in Hull put it:

"I don't think we would have been in a position to respond to climate change [before 2007] and our understanding of what we need to do to respond wouldn't

have been there without those events I don't think." (Interview Local Councillor LAM7, 2011 pg 6)

In this quote, I believe that the councillor is referring not only to the way in which the 2007 floods provided a tangible example of the changing nature of risk in the city of Hull, but also the way in which the events forced local officials to consider their responsibilities regarding environmental risk more generally. In the division and assigning of responsibility, there lies an inherent risk of losing strategic overview and holistic understandings, which must be reflected upon.

In spite of what is often reported about the benefits of a broad, polycentric governance network and its ability to incorporate a wide range of perspectives and understandings, in assigning roles and responsibilities to the organisations involved in the governance of environmental issues such as flooding, the opportunity for gaps in knowledge to obscure part of the problem can lead to the accumulation and compounding of vulnerability to those risks that were previously overlooked. In light of this, it becomes clear that environmental governance networks are highly dependent on crisis events to expose the risks that have not previously been framed as such and which force academics, policy-makers, politicians and the public to rethink the spaces and institutions of environmental governance.

APPENDICES

APPENDIX A: INVITATION TO INTERVIEW LETTER

Alexia Rogers-Wright
Department of Geography
University of Hull
Cottingham Road
HULL, HU6 7RX
a.f.rogers-wright@2008.hull.ac.uk

Date

Dear,

Research on flood risk in and around Kingston-upon-Hull

I am investigating different ways of dealing with flood risk as part of my PhD research in the Department of Geography at the University of Hull. This study aims to analyse the governance arrangements surrounding flood risk and the interaction of government-led and community-led initiatives to reduce flood risk in the north Humber area. For your information, a summary of the research questions which I am intending to address is included at the end of this letter.

Whilst exploring the flood management arrangements in this area I have become aware of your involvement in flood policy. [insert specific example here e.g. participating in the Environment and Transport Overview and Scrutiny Commission Water Management Workshop in December 2009]. I am contacting you as I hope that you would be able to provide valuable insights into the process of flood risk policy-making and implementation. I would very much like to interview you for my research – interviews are expected to take approximately 1 hour. This letter will be followed up within two weeks with an email or telephone call to see if we can arrange a mutually convenient time to meet.

If you feel that you are not the right person to talk to within your organisation, please feel free to pass this request on to someone else. Please be assured that all interviews will be treated in the strictest confidence and individuals will not be identified in the outputs of the research.

My research is sponsored by the Economic and Social Research Council (the national funding agency for Social Science Research in Higher Education) in collaboration with Hull City Council. The results of my research will be used to inform policy-makers wishing to better understand the flood risk issues in the area, as well as being used in the writing of my PhD thesis. The project conforms to the Ethical standards of the Economic and Social Research Council and the University of Hull. The research is supervised by Professor Graham Haughton, Professor Tom Coulthard and Professor Greg Bankoff.

With best wishes, and thanks in anticipation,

Alexia Rogers-Wright

Research Questions:

1. What constitutes flood governance in Hull and how effectively does it operate in the metropolitan area?
2. What constitutes a community approach to flood risk management in the UK and specifically in Hull?
3. In what ways can flood governance in Hull be improved by a more effective synergy between top down, government led schemes and bottom up, community based initiatives?

APPENDIX B: INTERVIEW GUIDE: POLICY-MAKERS

Date:	
Interviewee:	
Organisation:	
Interviewee's role:	

Give a short introduction to the research.

Restate terms of interview and get participation agreement signed.

Please could you introduce yourself for the tape.

1. ORGANISATION INFORMATION

1.1 Could you describe your organisation?

1.2 Does your organisation have a responsibility to reduce the flood risk facing your area?

1.3 How important are flood risk issues to your organisation's work programme?

Does this change over time?

1.4 What are the main challenges your organisation faces in managing flood risk?

1.5 Could you describe your present tasks and areas of responsibility? Were you in your position at the time of the 2007 flood event? What was your experience of the floods?

1.6 How did the floods change your area or organisation?

2. COMMUNITY ACTION AND FLOOD RISK

2.1 Did you notice any difference between the ways in which different communities responded during the floods?

2.2 How long was flooding a buzz issue? Has it fallen down the agenda and/or been incorporated as a more prominent part of business?

2.3 Are you aware of either any existing community groups with a change in focus or new community groups which deal with flooding issues? (pre/post 2007)

2.4 Have community groups become more active since the 2007 floods?

2.5 To what extent has your organisation tried to foster community action to address flood risk issues?

2.6 In what ways have you engaged with community action groups?

- 2.7 How important do you think community action groups are to flood risk management? Does this change over time?
- 2.8 What gives one group more influence in the policy arena? (Community connections? Partnerships with other groups? Expert knowledge?)
- 2.9 How important to you is your relationship with community action groups?
- 2.10 Do you consider yourself to work in partnership with community groups?

3. PARTNERSHIP WORKING

- 3.1 To what extent do you engage with different organisations on flood issues? Who? How? Why? Formal or informal? How often? (Other community groups or government or other?)
- 3.2 How effective is the partnership?
- 3.3 Has anything changed since the flood event in 2007? Would you say that these changes were attributable to the flood event?
- 3.4 How could it be improved? Could government do anything to encourage partnership working (with government and between third parties)? If so, what?
- 3.5 Who is not adequately involved in the flood governance process that ought to be?

4. CHANGES

- 4.1 What has been the effect of recent changes in flood risk management policy on both the perceptions and the reality of people's vulnerability to flooding?
- 4.2 What was the nature of the changes?
 - New information and awareness
 - Shift of mentality
 - New tasks or routines
 - New powers available (economic, legislative etc)
 - Changes of organisation's structure
 - New staff
- 4.3 How did these changes relate to other things happening at the same time (flood event, political decisions, political changes, plans, reports, reviews, etc)? Were changes triggered by anything?
- 4.4 Who instigated the changes? (Top down or bottom up? Scientific or lay knowledge? Pitt Review?)

5. FUTURE

- 5.1 Ideally, how would you tackle flood risk issues in the area in the future? (short term & long term)
- 5.2 Do you have any concerns about the legacy the current system leaves for future generations?
- 5.3 Which groups in society remain most vulnerable to flooding in the future?
- 5.4 Realistically, how do you imagine flood risk issues in this area being tackled in the future? (short term & long term)

CLOSE

Any questions or further comments? Any suggestions for further contacts?

Thanks!

APPENDIX C: INTERVIEW GUIDE: COMMUNITY GROUPS

Date:	
Interviewee:	
Organisation:	
Interviewee's role:	

Give a short introduction to the research.

Restate terms of interview and get participation agreement signed.

Please could you introduce yourself for the tape: role and background?

1. ORGANISATION INFORMATION

- 1.1 Could you describe your present tasks and areas of responsibility?
- 1.2 Could you describe your organisation?
- 1.3 When was it set up? Did it evolve from another group? Pathways to membership – are members also part of another group with another purpose? Expected longevity?
- 1.4 Who is involved? How many members do you have? How many people attend regularly? How many people are in the wider group? Has this changed over time? Gender balance? Socio-economic profile? Is this representative of the local area? Are certain groups in the community more active? Are certain groups in the community missing?
- 1.5 How often do you meet?
- 1.6 What is the remit/modus operandi? Are you a single-issue group? Does this change over time? How often do flood issues arise in discussion? What other issues keep the group going? Does this change over time?
- 1.7 What actions has your organisation taken to reduce the flood risk facing your area? (Based on expert or lay knowledge?)
- 1.8 How effective do you think these have been?
- 1.9 What are the main challenges your organisation faces in managing flood risk?

2. THE JUNE 2007 FLOOD EVENT

- 2.1 What did you do during and after the floods?
- 2.2 How did the floods change your area or organisation?
- 2.3 Did you notice any difference between the ways in which different communities responded during the floods?
- 2.4 Has your community group become more active, in relation to floods or more widely, since the 2007 floods?
- 2.5 How long was flooding a buzz issue? Has it fallen down the agenda and/or been incorporated as a more prominent part of business?

3. POLICY AND FLOOD RISK

- 3.1 How effective do you think government flood risk reduction policies are in Hull (against pluvial flooding) now and before the 2007 flood event? What could be improved?
- 3.2 Have you had any involvement in flood related policy-making processes, e.g. responding to consultations or attending meetings, lobbying, feedback to funders?
 - How did you get involved in these processes?
 - Do you feel as though you have had any influence on flood policy through these processes? Or do you feel as though you have been co-opted by the process? What has been the effect of this on your group?
 - Who do you feel has the most influence in the flood policy-making process? National government, regional bodies, local authorities/
 - On whose terms do you engage with policy-makers? If theirs, are you always willing to do so? Do you ever walk away?
- 3.3 How effectively do you feel changes in policy translate to actions on the ground?
- 3.4 Have any local or national policies had a direct impact on you? If so, do they reflect local community priorities? Have they made things better or worse?
- 3.5 How important do you think community action is in local flood related policy-making?
- 3.6 What role should the local authorities play in the process?

4. PARTNERSHIP WORKING

- 4.1 To what extent do you engage with different organisations on flood issues? Who? How? Why? Formal or informal? How often? (Other community groups or government or other?)
- 4.2 How effective is the partnership?
- 4.3 Has anything changed since the flood event in 2007? Would you say that these changes were attributable to the flood event?
- 4.4 How could it be improved? Could government do anything to encourage partnership working (with government and between third parties)? If so, what?
- 4.5 Who is not adequately involved in the flood governance process that ought to be?

5. CHANGES

- 5.1 What has been the effect of recent changes in flood risk management policy on both the perceptions and the reality of people's vulnerability to flooding?
- 5.2 What was the nature of the changes?
- New information and awareness
 - Shift of mentality
 - New tasks or routines
 - New powers available (economic, legislative etc)
 - Changing distribution of risk and responsibility between agencies and actors
 - Changes of organisation's structure
 - New staff
- 5.3 How did these changes relate to other things happening at the same time (flood event, political decisions, political changes, plans, reports, reviews, etc)? Were changes triggered by anything?
- 5.4 Who instigated the changes? (Top down or bottom up? Scientific or lay knowledge? Pitt Review?)

6. FUTURE

- 6.1 Ideally, how would you tackle flood risk issues in the area in the future? (short term & long term)
- 6.2 Do you have any concerns about the legacy the current system leaves for future generations?
- 6.3 Which groups in society remain most vulnerable to flooding in the future?
- 6.4 Realistically, how do you imagine flood risk issues in this area being tackled in the future? (short term & long term)

CLOSE

Any questions or further comments? Any suggestions for further contacts?

Thanks!

APPENDIX D: INTERVIEW CONSENT FORM



FLOOD RISK AND VULNERABILITY IN HULL INTERVIEW CONSENT FORM

- I understand that this interview will be recorded, transcribed and analysed for use in an academic research project examining flood risk mitigation and economic development at the University of Hull.
- I understand that my personal details **will not** be passed on to any other parties.
- I understand that my personal details **will not** be held on any computer, either at the University of Hull, or elsewhere after the research project is completed.
- I understand that all information obtained during this interview is coded during analysis, providing anonymity for all participants. Under no circumstances will you be personally associated with any responses you give during this interview.
- I understand the research findings (using coded data) may be published in an academic journal.
- I understand that Hull City Council will have access to coded anonymous data from this interview which may be used to help them formulate future flood risk reduction strategies.
- I understand that this sheet will be kept secure in the Geography Ethics Department at the University of Hull and **will not** appear in any write-up or publication of this project. It will not be possible for any parties, including the University of Hull, to trace specific interviewee responses using this form.
- I am entitled to a copy of the transcript of this interview if I so desire.

Name of Participant: _____

Signature of Participant: _____

Date: _____

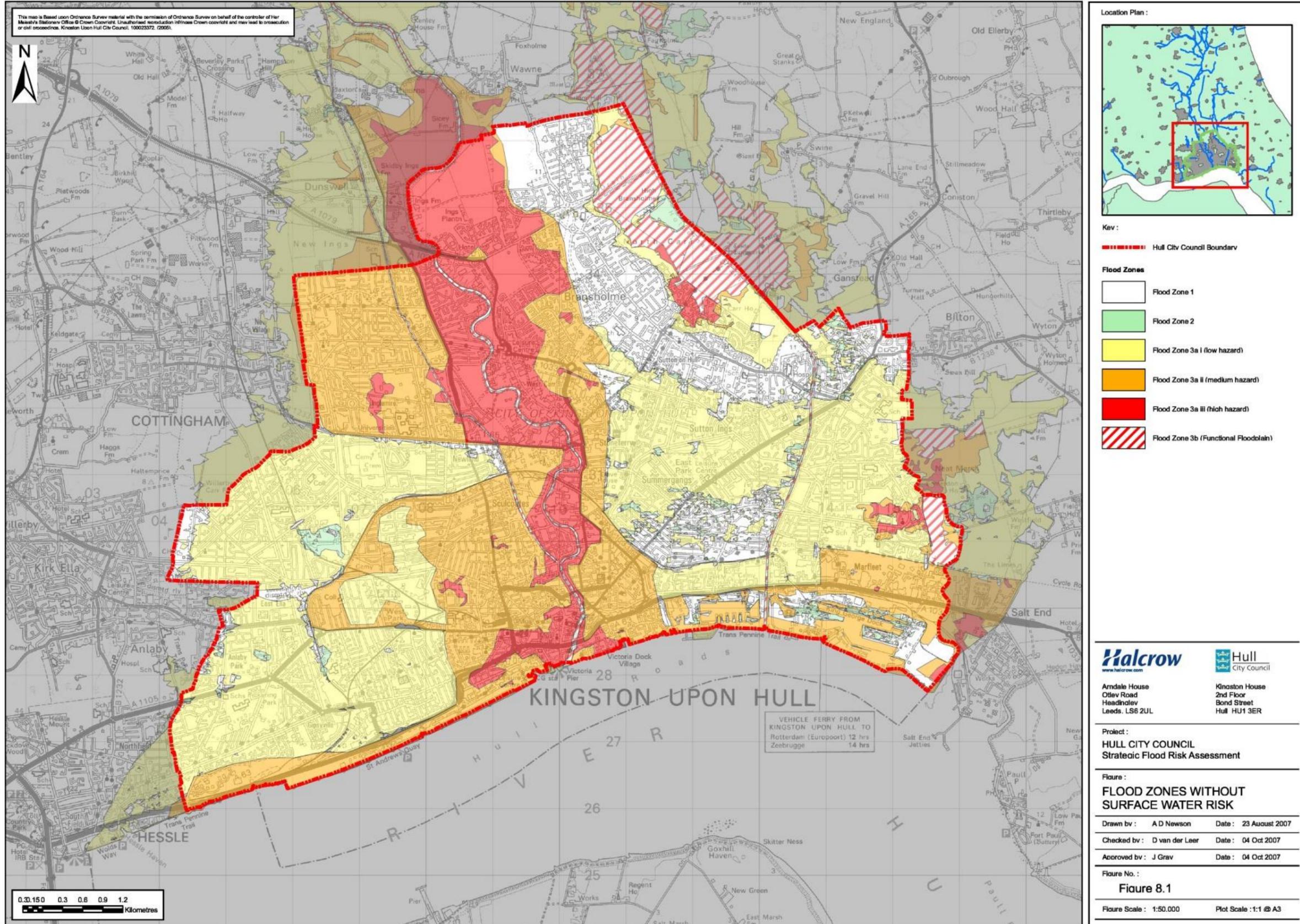
Alexia Rogers-Wright
PhD Research Student,
Geography Department
The University of Hull
HU6 7RX



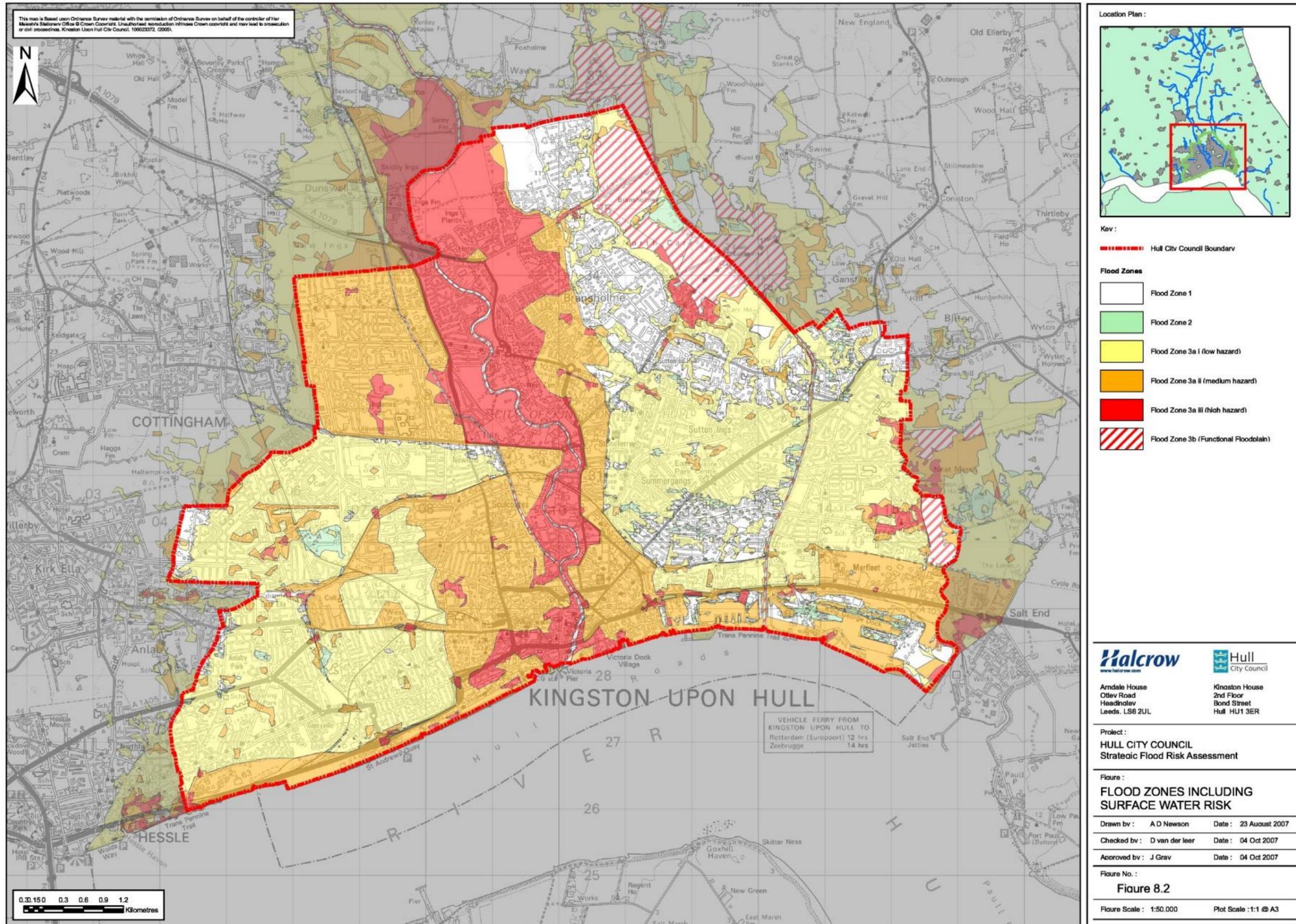
APPENDIX E: INTERVIEW PARTICIPANT CODING

LAO 1	Local Authority Officer	3/3/2010
LAO 2	Local Authority Officer	8/4/2010
LAO 3	Local Authority Officer	30/4/2010
CR 1	Community Representative	26/5/2010
GA 1	Government Agency	28/6/2010
LAM 1	Local Authority Member	2/7/2010
PC 1	Private Company	6/7/2010
LAM 2	Local Authority Member	13/7/2010
CR 2	Community Representative	13/7/2010
LAM 3	Local Authority Member	13/7/2010
LAM 4	Local Authority Member	14/7/2010
LAM 5	Local Authority Member	14/07/2010
LAO 4	Local Authority Officer	15/7/2010
LAO 5	Local Authority Officer	16/7/2010
CR 3	Community Representative	19/7/2010
LAM 6	Local Authority Member	22/7/2010
LAO 6	Local Authority Officer	27/7/2010
LAO 7	Local Authority Officer	27/7/2010
LAO 8	Local Authority Officer	30/7/2010
LAO 9	Local Authority Officer	06/09/2010
GA 2	Government Agency	08/09/2010
LAO 10	Local Authority Officer	10/9/2010
CR 4	Community Representative	05/01/2011
CR 5	Community Representative	12/01/2011
LAO 11	Local Authority Officer	08/02/2011
LAO 12	Local Authority Officer	08/02/2011
LAM 7	Local Authority Member	08/02/2011
LAO 13	Local Authority Officer	09/02/2011
LAM 9	Local Authority Member	10/02/2011
CR6	Community Representative	11/02/2011
CR7	Community Representative	11/02/2011

APPENDIX F: HULL STRATEGIC FLOOD RISK ASSESSMENT (PRE 2007)



APPENDIX G: HULL STRATEGIC FLOOD RISK ASSESSMENT (POST 2007)



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