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The role of place attachment in proactive and reactive adaptation to flood risk

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Abstract

This research examines the role of relationship with place in reactive and proactive adaptation to flood risk in England. There is currently little research into how floods affect relationship with place and how this relationship may determine adaptive behaviour. As the social limits to adaptation are increasingly recognised, theories about relationship with place offer a new perspective as to how flood risk is interpreted and acted on. This research examines how place attachment and place meaning interacts with flood risk at the household and community scale, and the role of place attachment in involvement in adaptation planning decisions.

Fieldwork took place in two locations, Cumbria, where adaptation measures were in response to flooding that occurred in 2009 and Barnes, an area that is at risk of flooding and is part of the Thames Estuary 2100 plan that addresses flood risk in the coming century. Place attachment, place meaning, social capital and trust in institutions were examined using face-to-face surveys (n=380). In order to gain a deeper understanding of the relationship between place and flood experience in-depth interviews were carried out with fourteen older adults in Cumbria.

The study finds that place attachment predicts choices and behaviours in pro-active adaptation to flood risk. When adaptation is reactive the strength of the relationship between adaptation behaviour and place attachment weakens. Following a flood, place related meanings change, this research finds that social aspects of place become more important to the individual and shape how place is experienced and can act to increase adaptive capacity. These findings demonstrate the dynamic nature of relationship with place and suggest that place attachment plays a different role in involvement in adaptation decisions depending on whether behaviour is in anticipation of, or in reaction to, environmental risk.

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Chapter 1: Introduction

This study examines the role of place attachment and place meaning in adaptation to climate change. It focuses on the effect of place processes on adaptive capacity and how relationship with place may shape involvement in planning decisions. Adaptation to climate change will involve 'adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts' (Smit and Pilifosova, 2003:881). It can be carried out in response to or in anticipation of climate change, and these temporal framings may cause decision-makers to draw on different values and resources (Smith et al., 2000). Given that the evidence for climate change is now overwhelming; understanding how individuals, groups and organisations can and will adapt to change becomes an increasingly important research and policy issue (Stern, 2006; Pielke et al., 2007).

1.1 Social aspects of adaptation to climate change

The increased attention paid to climate change adaptation in political as well as research circles from the early 2000s has seen perspectives on adaptation expand (Pielke et al, 2007). Initially adaptation discourse focused on the economic and 'objective' implications and possibilities for adaptation, informing policies and debates. These framings are attractive for decision makers as they are quantifiable and commensurable with other forms of climate change analysis such as modelling and forecasting (Adger et al., 2009).   More recently, this discourse has expanded to include the social limits and the implications of, and for, adaptation. Psychological and sociological variables such as values, ethics, and perceptions of risk have been identified as important shapers of climate change interpretation and adaptation (Lorenzoni et al., 2007; O'Brien, 2009). This expansion in focus has been in reaction to the lack of explanatory power that such technological and economic framings have in understanding why individuals do not fully make use of their adaptive capacity. Social limits to adaptation have very tangible impacts on adaptation procedures and outcomes (Adger et al.,

2009); by examining adaptation processes it is possible to gain a clearer understanding of the social mechanics underlying adaptation behaviour.

To date, adaptation research has underscored the need to prepare for change in the future and to reduce underlying vulnerabilities that produce negative consequences of climate change (Wilbanks and Kates, 1999; Adger et al., 2005 Smit and Wandel, 2006). Adaptation goals are rooted in social processes; As Adger et al. suggest 'an adaptable society is characterized by awareness of diverse values, appreciation and understanding of specific and variable vulnerabilities to impacts, and acceptance of some loss through change' (2009: 350). An important element of this relationship is the impact that change will have on relationship with place and how this may shape adaptive behaviour. Place attachment, as well as contributing to well-being, also informs attitudes and place related behaviour (Burley, 2007; Norris et al., 2008; Willox et al., 2012). Whilst the underrepresentation of place meaning in climate change decisions has been identified (Agyeman et al., 2009; Adger et al., 2011) there is a lack of empirical work on understanding how place attachment may affect involvement in adaptation decisions.

1.2 Place attachment and adaptation to climate change

Adaptation will be physically and socially contingent on local landscapes and communities, and will entail in most cases some form of place change (Brooks and Adger, 2005). Either the environment will change as a direct result of climate change, or adaptation projects will result in physical changes to places (Devine-Wright, 2013). The physical changes brought to bear by climate change coupled with the importance of place for well-being means that this juncture will have important implications for adaptation aims and how adaptation processes unfold. These changes will require decisions at several different scales: indeed, place researchers have identified the socio-political role of place attachment as an area for further study (Manzo and Perkins, 2006; Lewicka, 2011).

Environmental change can make the importance of place more obvious to individuals (Milligan, 1998; Guiliani, 2005). The sometimes latent importance of environments (Chamlee-Wright and Storr, 2009) suggests that environmental changes accompanying climate change may make place more salient for individuals and communities. Changes to places and place meaning may result in the loss of traditions and familiar routines (Dixon and Durrheim, 2004; Willox et al., 2012), it may lead to people living with a constant, uneasy awareness of the slowly unfolding change (Burley, 2007) or destructive events may tear away symbolically important places that leave individuals feeling unanchored and distressed (Twigger-Ross and Uzzell, 1996). There is, however, little empirical research about how place attachment affects, shapes, supports, and prevents adaptation to changing weather-related risks (the major manifestation of how climate change will be experienced).

Adaptation will not only be in reaction to events. As climate change sits near the top of many policy agendas, long-sighted pro-active adaptation plans are in development. However, pro-active planning processes will not be informed by experience of place change, but anticipated change. As Smith et al. (2000) outline, the resources drawn on for proactive and reactive adaptation are difference and this could also be extended to social resources drawn upon to adapt to climate change. Given that reactive decision making about place is likely to be informed by reactions to place change and that pro-active adaptation decisions will not be informed by direct experience of such change, the possibility opens up that place attachment may shape behaviour differently depending on whether adaptation is reactive or proactive. Are reactive decisions most likely to truly reflect the importance of place as its significance has been made salient by disruptive events, or are pro-active decisions, taken in relatively stable circumstances more likely to reflect the full range of place values, undisturbed by disruptive place change?

By considering these two timeframes in this study the intention is to understand if environmental change makes place attachment more likely to

manifest in place related decisions and behaviour. Empirical data on the impact of place change on place attachment and involvement in planning decisions is extremely limited. Manzo and Perkins identify that 'Typically, literature on place attachment focuses on individual feelings and experiences and has not placed these bonds in the larger, sociopolitical context in which planners operate. Conversely, the community planning literature emphasizes participation and empowerment, but overlooks emotional connections to place" (2006: 335). Given that climate change is likely to entail changes to places, this research contributes to understanding about what the social limits of climate change adaptation may be and where there may be potential for environmental change to contribute positively to communities and places.

1.3 Current research on Place

Place attachment literature has proliferated in the past forty years. People's relationship with place has been studied across a number of disciplines including recreational studies, environmental psychology, anthropology and management studies (Lewicka, 2011).). The proliferation of place attachment research has made it one of the most debated concepts in environmental psychology (Devine-Wright, 2013). Only recently has place theory started to explicitly inform adaptation discussions (Agyeman et al., 2009; Adger et al., 2011; Gifford, 2011), these discussions demonstrate the importance of place meaning in people's interpretation of place change and willingness to adapt, and highlights the significance of the relationship between place-attached individuals and related behaviours (Devine-Wright, 2013).

People form emotional bonds with places that they have repeated experiences in, and these place based experiences result in identification with places. Therefore changes to place have a psychological impact on the people who identify, and have emotional bonds, with such places. Research has demonstrated that place continuity contributes to well-being (Theodori, 2001), and that place change can result in reduced well-being and place

protective action (Devine-Wright, 2009). Often, the importance of place to the individual is subconscious, and only becomes evident if the place is threatened or changes (Brown and Perkins, 1992; Chamlee-Wright and Storr, 2009). Place change as a result of climate change will be incremental or sudden; any change to places that are relied on for continuity or are emotionally salient for an individual can make the significance of place more obvious or evident (Burley et al., 2007).

Place research has examined both the strength of people's attachment to places (Williams and Vaske, 2003) and the meanings that places hold for individuals (Kyle et al., 2004; Manzo, 2005). Place-related meaning research focuses on what places mean to people. Meaning shapes how a person relates to a place, and how place change is interpreted. Research has demonstrated that different place values often explain confrontation over management of places (Yung et al., 2003; Kyle et al., 2004, Davenport and Anderson, 2005). Another strand of place research takes place attachment a step further, examining the strength of people's place attachment and how place attachment may correlate with attitudes or behaviour (Vorkinn and Riese, 2001). This approach to place research is based on the premise that if someone experiences an attachment to a place they are more likely to undertake behaviour to protect a place, reflecting the mother-child attachment theory put forward by Bowlby (Bowlby, 1969; Devine-Wright, 2013). However, the empirical data from research into this expected relationship has produced ambiguous results (Carrus et al., 2005; Harmon et al, 2005; and Gosling and Williams, 2010). Place attachment is not always associated with place focused actions. Other factors such as social capital, can mediate the strength of the relationship (Manzo and Perkins, 2006). The results from these studies suggest that the link between place attachment and specific behaviours is a nuanced one, and one that merits further research.

1.3.1 Place attachment and adaptation to flood risk in the UK

There is already evidence about the significant impact of flooding on place meaning (Tapsell et al., 2008; Carrol et al, 2009), flood events lift the subconscious elements of place to the fore (Milligan, 1998; Chamlee-Wright and Storr, 2009). For this reason flood events offer a particularly useful lens through which to study what place change means for people and how it may affect people's involvement in managing places. In the UK flooding is set to be the most significant impact of climate change (UK Government, 2012) flood management is also going through a period of change as insurance firms and the government negotiate distribution of coverage (ABI, 2013). This confluence of climate change and flood risk management evolution provides an impetus to examine issues around adaptation to flood risk. Specifically, how place change may shape involvement in adaptation decisions, contributing empirical evidence as to the socio-political role of place and providing insight to planners about the psychological and symbolic importance of local places.

1.4 Research focus, questions and structure

This research asks what it is about flood risk that may shape place meanings and does direct experience of a flood event make it more likely that a place-attached individual will undertake place management behaviour. When planners and communities are reacting to place change and putting in motion adaptation plans for future risk, how significant is direct experience in shaping adaptive behaviour, is place attachment a latent emotion triggered by disruptive events or does it also shape behaviour when place change is prospective?

The first two research questions below examine the role of place attachment in the process of environmental planning decision-making that is required to deal with the emerging risks of climate change. The third research question examines the impact of flood experience on relationships with

place. This research project sits at the intersection between environmental planning and psychology in assessing how place attachment interacts with adaptation planning and strategies.

The role of place attachment in pro-active and reactive adaptation will be addressed through the three following questions that centre around how flood risk management is distributed, how willing individuals are to contribute opinions to this management and how flood events affect perception of place:

- Do relationships with place predict expected distribution of responsibility in proactive and reactive flood risk management?

- Do relationships with place predict participation, or planned participation, in adaptation decisions in proactive and reactive flood risk management planning processes?

- How does a flood event affect perceptions of place (at the house and town/village scale) for flooded and non-flooded households? (with a particular focus on older adults)

These questions will be addressed using two study areas: The Thames region and Cumbria. Barnes will be the focus of pro-active adaptation on the shores of the river Thames, and in the Cumbria study area the towns of Keswick and Cockermouth are the focus of fieldwork in relation to reactive adaptation to flooding.

Figure 1.1 on the next page illustrates the structure of this thesis and a summary of chapter content. The results from the two study areas are drawn together to consider similarities and contrasts in the discussion chapter, and the implications of the study are considered in the final concluding chapter.

Chapter 2: Literature review
How people relate to place and what factors influence this relationship. How place attachment relates to wider community based social processes. This chapter then highlights why place attachment is important for climate change adaptation and how a reactive and proactive framing affects adaptation decisions.

Chapter 3: Methodology
Reasons for research approach are presented, details of surveys and interviews are detailed. Methods of analysis and their limitations are discussed.

Chapter 4: Place attachment and flood management choices
Place attachment is found to be unrelated to expectations of flood management distribution. However, place attachment does affect participation in flood management decisions. This relationship is shaped by reactive and proactive framing, and whether floods are experienced directly or indirectly.

Chapter 5: Relationship with place and older adults' experience of a flood event
Interviews with older adults reveal the impact of floods on place related meaning, the significance of social networks in recovery from floods and in flood interpretation and the significance of narratives in interpretation of floods.

Chapter 6: Discussion
Results from chapters 4 and 5 are brought together to discuss the importance of place attachment and place related meanings. The lack of relationship between place attachment and expected distribution of responsibility is discussed. The discussion then turns to the role of place attachment, trust and social capital in involvement in proactive and reactive flood management decisions.

Chapter 7: Conclusion
The implications of this study are discussed, policy implications are highlighted and possible areas for future research are recommended.

Figure 1.1: Thesis Structure

Chapter 2: Literature Review

As indicated in Chapter 1, the impacts of climate change will be far-reaching and disruptive. Successful adaptation to these changes will inevitably involve periods of shock and adjustment (Adger et al., 2012a), requiring well informed policy and planning. Adaptation will involve proactive projects, and inevitably, reactive action following events, the success of these projects will be judged in light of societal norms and values (Adger et al., 2009). Increasingly, the social sciences are providing a greater understanding of what successful adaptation may look like and how it can be achieved. One field of research that is expanding and starting to inform discourse around climate adaptation is the role of place attachment. This chapter will outline the significance of understanding social processes in climate change adaptation, the growing field of place research, what the different concepts that describe relationships with place are and how these may enable or constrain adaptation to climate change.

2.1 Adapting to a changing climate: the role of social processes

As detailed in Chapter 1, focus on adaptation to climate change has expanded over time to include broader aspects of capabilities and limitations. Initially, research and policy focused on the ecological, physical, economic, and technological limits – areas of change that can be relatively straightforwardly quantified and modelled (Adger et al., 2009). However, such analyses were limited, as objective capabilities and resources do not always result in expected behaviour (Grothman and Patt, 2005). Psychology and sociology provide insights into the variety of ways people perceive information on climate change and the possible motivations for adaptation action providing further understanding of adaptive capacities and vulnerabilities (Lorenzoni et al., 2007; Adger et al., 2009; O'Brien, 2009).

In considering the social processes and structures that affect how climate change is experienced, we shift the focus and understanding of adaptation

planning slightly; expanding approaches to understanding what adaptation means for people introduces different measures of what makes adaptation successful and what may make adaptation unsuccessful (Grothman and Patt, 2005; Adger et al., 2009). The environmental and social contexts that mitigation and adaptation project unfold in are not always recognised in planning decisions (Cowell, 2010). The same information will not result in the same behaviour in different locations and between different people. Research has reflected this more subjective, situated decision-making through investigating the role of variables such as values, identity and culture in framing adaptive action (O' Brien, 2009; Devine-Wright, 2010; Adger et al., 2011). One emerging strand of the social aspects surrounding adaptation research is the significance of place in attitude formation and related behaviour. The significance of place as an analytical tool for understanding the impacts of adaptation has started to gain traction in academic literature, as I set out in more detail below (Adger et al., 2011; Misrah et al., 2011; Agyeman, 2012). Given that adaptation is likely to unfold at the local level in places that people can relate to, place research offers a particularly useful framework for understanding how adaptations may be perceived and how processes around adaptation can successfully address issues of place.

2.2 The different ways people relate to place

In the sociological, psychological and human geography literature there is a number of ways in which our relationship with place is described and categorised (Guiliani, 2003). Four decades of place research has generated a diverse field of theories and empirical evidence (Freid, 2000; Lewicka, 2011). The definitions in place research are to some extent still being contested; with various threads of research attempting to delineate different ways in which we relate to place and how we may be able to empirically capture these relationships (Lewicka, 2011; Williams, 2013). The breadth of place research incorporates a range of disciplines, and contains a range of epistemological and ontological approaches. The main two threads of research, as highlighted by

Patterson and Williams (2005), is the psychometric positivist tradition that focuses on the measuring an individual's relationship with a place and the phenomenological approach taken by researchers such as David Seamon. The psychometric approach, defines relationship with place as a measurable cognitive process that can then be linked to attitudinal and behavioural variables (Stedman 2003, Lewicka 2005, Patrick Devine-Wright and Howes, 2010). Phenomenological researchers describe place as a constantly generative and constructed aspect of the lived experience with attachment being just one element of a larger experience of place, as Seamon sets out place is 'any environmental locus in and through which individual or group actions, experiences, intentions, and meanings are drawn together spatially' (Seamon, 2013:61). This approach means that place cannot be measured using quantitative techniques as these are unable to capture the depth and dynamism of a phenomenological account of place. Instead, place can be reflected in qualitative accounts - and comparisons can be made across accounts to see where there are common elements in experience across people and places.

The environmental psychology literature demonstrates the relationship between affective and cognitive aspects of relationship of place with place related attitudes and behaviour (Stedman, 2003; Long and Perkins, 2009; and Devine-Wright 2009). This thesis will build on frameworks used by environmental psychologists as I intend to explore how place related processes inform attitudes and behaviour around flood risk management.. In measuring place quantitatively I can test the relationship between place attachment and different aspects of decision-making. In order to try and understand the processes through which relationships with place can shape adaptive capacity I will use a more qualitative constructivist approach similar to Manzo et al's (2008) accounts of place and Tuohy and Stephens (2012) narrative analysis of the experience of floods. This constructivist approach is not as contextually contingent as some of the phenomenologist's approach as the intention for this project is to be able to generalise findings to a wider population. For some phenomenological approaches, cross case comparisons are difficult – as an individual's experience of life is not easily compared to another person's

experience. In this project, whilst some data collection will be rooted in social constructionism I believe that individual experiences can be usefully compared and commonalities can be identified. This qualitative data offers another layer of analysis alongside the quantitative approach, providing a fuller account of an individual's lived experience.

What is clear from considering the literature is that place research, and the concept of place itself is not monolithic, and a pluralist approach can be useful (Patterson and Williams, 2005). I believe that place is multi-layered. Place meaning and symbolism is socially constructed through experience and interactions in place. This place meaning contributes to place identity and continuity – and psychometric measures of place attachment measure the strength of affective and cognitive relationships to these socially constructed meanings. Qualitative and quantitative methods can be used to shed light on these different aspects of relationship with place.

2.2.1 Affective, cognitive and instrumental relationships with place

Place research uses a variety of methods and metrics to capture relationship with place. Using Manzo's (2003) review of place literature, I set out the four main threads of analysis that she identifies: sense of place; place attachment; place dependence; and place identity. Sense of place, rather than referring to a specific construct is in fact a broad concept, and it has been suggested that it is more an overarching term for place attachment, place dependence and place identity (Jorgenson and Stedman, 2001; Pretty et al., 2003). Place, rather than simply acting as an objective physical container for people's lives, can be very much socially constructed and is constantly interacting with people's everyday life: 'Location itself is not enough to create a sense of place – It emerges from involvement between people, and between people and place' (Pretty et al., 2003:4). This broad description of place can then be broken down into more specific dynamics that focus on utilitarian, affective and cognitive aspects of relationship with place (Williams and Vaske, 2003).

The first of these subcategories is place dependence. Place dependence is a resource- and function-driven relationship, based on how a place is able to best facilitate achievement of goals, such as fishing, running, schooling or shopping, in comparison with other possible locations (Stokols and Schumaker, 1981; Williams and Vaske, 2003). As Williams and Roggenbuck (1989) state, place dependence is not always accompanied by a strong attachment to place. To some extent, the literature suggests that place dependence commodifies relationship with place, if two locations provide the same goal-setting conditions then there will be no preference for either place. By serving as a barometer for how best an area provides certain choices, place dependence can indicate why people may choose to live in or visit certain places. However, this utilitarian relationship with place does not always accurately predict related behaviour. Increasingly, affective and cognitive relationships, namely place attachment and place identity, are being identified as the underpinning mechanism for certain place-related decisions (Stedman, 2002; Kyle et al., 2003 Devine-Wright, 2009).

Place attachment is often described as a positive, emotional and cognitive attachment between individuals and community, and between individuals and place (Altman and Low, 1992; Brown and Perkins, 1992; Fried 2000). It has evolved from Bowlby's theory of attachment between children and their caregivers; this theory declares a desire to maintain closeness to the object of attachment (Bowlby, 1969; Hildalgo and Hernandez, 2001). Milligan's (1998) interactionist argument for place attachment highlights that although all social interactions weave meaning into places, when this meaning is significant, whether this is recognised at the time or not, the relationship with the site deepens to one of place attachment. Place attachment is constructed of memories of past events in a location, combined with the potential for future interactions (Milligan, 1998). Anything that threatens places that people are strongly attached to can have very real emotional impacts on the affected individuals. Low's (1992) study of changes to a Plaza in San Jose describes how one subject cried as he recalled the removal of two trees that he was used to

sitting underneath in the plaza. This bonding of people to place can lead to action to preserve emotionally significant attachments (Devine-Wright, 2010).

Closely linked to place attachment, and with many descriptions allocating them similar traits, is place identity (Hernandez et al., 2013). To fully understand the role of place identity, it is useful to refer to the literature on social identity management in everyday life. Within sociological analysis, identity theory is pulled out from the mind of the individual and is located in broader social processes. People are located within social webs, fulfilling a variety of roles depending on the context they are in – an individual can be a mother, daughter, sister, boss, friend, marathon runner, and within different contexts the importance of these roles will change. People interpret information they receive about themselves from others and consider whether this information reinforces their desired place and role in these webs, or whether such interactions undermine or contradict their position and self-perceptions (Tajfel and Turner, 2004). Through such interactions we form a sense of ourselves and also a sense of who or what we are different to, gaining a lot of our self esteem and sense of who we are from our unique characteristics and the characteristics that we share with the groups and places that we belong to (Twigger-Ross et al., 2003). This sense of self is something that we act to maintain in terms of authenticity and continuity, it can be an important motivator in determining how we behave. When information we receive from external sources jars with how we view ourselves, or our environment contradicts how we identify ourselves, it can be an uncomfortable experience, which in the longer term can undermine our well-being (Howard, 2000). Place identity is one element of the individual self-concept that is shaped by the places that people pass through during their life (Fullilove, 1996). It is an aspect of the self that develops and is sustained in relation with the physical environment. It can act to motivate behaviour, to provide self-esteem through stability, and also contributes significantly to psychological well-being (Proshansky, 1978; 1983; Twigger-Ross and Uzell, 1996; Manzo, 2003).

The above descriptions of attachment, identity and dependence demonstrate the similarities and differences between these concepts, revealing the different facets of relationship with place that they capture. However, in the literature there is significant variation in how these three aspects are measured and utilised. Jorgenson and Stedman (2001, 2006) suggest that a sense of place subsumes attachment, identity and dependence. For other authors, place attachment is not a part of a larger concept, but is itself the item being measured and is constituted by other concepts; Williams and Vaske (2003) use a scale for place attachment made up of place identity and place dependence items, and Lewicka (2011) uses a scale made up of items related to place inherited, place relativity and place discovered. Kyle et al. (2005) include place identity and place dependence, in addition to social bonding indicators, in their place attachment work on recreational settings. An important delineation for Stokols and Schuaker (1981) was between the affective bonds of attachment and instrumental bonds of dependence. Lewicka's review article (2011) covers the variety of multi-dimensional and hierarchical constructs used in place research and suggests that "The various place attachment measures thus should be treated as an 'extended family' of methods rather than as precise measurement tools with well tested construct validity" (Lewicka, 2011:220). There is no single, or even commonly used, scale in place research – many authors add in different elements depending on the focus of their research. However, there is congruency between results, which indicates high validity and also a construct that can be captured using a number of different variables. In this thesis elements of place dependence, identity and attachment will be combined to construct a variable that reflects what place means to an individual.

2.2.2 Place as strength of attachment versus centre of meaning

Section 2.2.1 described how place research has used different concepts in order to clarify and refine different aspects of relationship with place and how they are measured (Manzo and Perkins, 2006; Scannell and Gifford, 2010; Lewicka,

2011). Section 2.2.1 describes some of the ways place attachment is operationalised in research, often in the form of quantitative place scales that set out to measure the strength of this relationship and to test whether it is determined by certain variables or predicts certain outcomes. In such research, place is a locus of attachment, and the strength of attachment to this locus, for example how strongly attached respondents are to a national park or their home town, is measured (Williams and Vaske, 2003). Another, more qualitative element of place research focuses on place as a centre of meaning, whereby the strength of attachment is less important than the meaning and symbolic importance of place (Stedman, 2003; Williams, 2013). While the meaning of place is closely related to attachment, it is conceptually and empirically distinct (Stedman et al., 2013). Meaning is acquired through individual and group memories; it can act as the mediating link between a physical place and strength of attachment to it (Stedman, 2003 and Lewicka, 2011).

Considering place as a locus of meaning requires different research methods to the ones described above. This more qualitative approach to place meaning research is described by Williams:

> *'From an interpretive or qualitative perspective, meaning is not so much a property of the person or the object, but a transaction between the two mediated through culture, social interaction, and individual past experience. In the qualitative approach, meaning is usually constructed and represented in narrative or storied accounts of peoples' relationship to a place.'* (Williams, 2013: 96).

Research focusing on the meaning of place does not preclude quantitative work or place scales, as different dimensions of place meaning are to some extent reflected in different items on place scales (Lewicka, 2011). However, research focusing on the symbolism of place emphasizes different interpretations of place. In discursive research, place interpretation and construction occurs within the narratives that people hold about their lives and the events in them; for example, an experience of a flood can be interpreted from a life-course perspective, narrative can act as bridges to the past, and relationships with

place can be a way of working out an individual's identity in the world (Manzo, 2005; and Tuohy and Stephens, 2012).

Dixon and Durrheim (2000) state that place identity is sometimes in danger of being partitioned off as a purely cognitive process, which as a result detaches it from the wider social world. They emphasise the role of dialogue in place identity formulation and how places can become contested areas of collective being and belonging. A discursive approach puts everyday language at the centre of place meaning and understanding (Di Masso, 2013). Massey (2005) describes place as a 'social act', as a junction of activity, and as constructed by social interaction, indicating that place is a dynamic and fluid process that is open to interpretation and negotiation. By locating relationship with place in a more discursive and social context it becomes apparent that any threat to place will impact on community and individual well-being, and that it becomes very much a political issue when decisions are made on how places – such as a local town square, a local beach or a playground – should be used or altered. Indeed, deciding who should contribute to discussions essentially entails deciding who belongs to a place and who does not (Manzo, 2003). When options are decided on how a place should be managed, changed, improved or even removed, automatically certain people's perception of place is prioritised.

In-depth interviews are often used to generate data on place meanings (Van Patten and Williams, 2008; Manzo et al., 2008). Visual methods can also be used to try and ascertain the meaning people attach to places, with the researcher providing a camera to participants for them to take their own photographs (Ponzetti, 2003; MacKay and Couldwell. 2004, Beckley et al., 2007) or with respondents being presented with a photo to discuss (Galasinska, 2003). Place meaning has also been researched using 'think aloud' protocols, rating of landscape values, and free associations tasks (Fishwick and Vining, 1992; Brown and Raymond, 2007; Devine-Wright and Howes, 2010). The research into place attachment and place meaning reveals different aspects of place, as Stedman et al. describe:

> Meanings are the symbols on which attachment rests: we become attached to the symbols we attribute to our places— as "home," as "escape," as "friendly," as "dangerous"— and seek to maintain meanings that we cherish and which produce attachment. (Stedman et al., 2013: 113).

Quantitative measures and deeper qualitative understandings of place may not be commensurable, but, when investigated in tandem with each other, can provide a fuller understanding of place.

2.2.3 Place attachment sense of community and social capital

As well as including a diverse number of categories and concepts, place attachment sits very closely alongside other closely related social concepts, particularly sense of community and social capital (Pretty et al., 2003; Manzo and Perkins, 2006; Long and Perkins, 2007). Some place research explicitly includes social bonds and connections in their place constructs (Kyle et al., 2005; Scopelleti and Tiberio 2010; Raymond et al., 2010). Long and Perkins (2007) suggest that place attachment forms part of a sense of community and they highlight that the sense of community index includes four items that are measures of place attachment. Other authors separate place attachment from sense of community, outlining the former as being a spatially bounded concept and the latter a socially oriented cognitive construct (Perkins and Long, 2002, Manzo and Perkins, 2006). Manzo and Perkins (2006) suggest that sense of community can complement place attachment in motivating neighbourhood-planning efforts. They also lay out the delineations between place and social aspects of community shown in Figure 2.1. This typology of the social and place elements of community highlight how closely the two constructs are related in terms of cognitive, affective and behavioural dimensions. A social constructivist approach to place would make these two concepts more difficult to separate from each other; attachment to place occurs as a result of social interactions and place attachment is then more difficult to untangle from community

attachment. Quantitative approaches do allow for sense of community and place attachment to be distinguished and measured separately from each other depending on the approach of the researcher.

	Community-related Dimensions	
	Place	Social
Cognitive	Place identity	Community identity
Affective	Place attachment	Sense of community
Behavioral	Participation in neighborhood planning, protection, and improvement	Neighboring activities, participation in crime prevention, community celebrations

Figure 2.1: A framework for organising psychological concepts that focuses on physical and social aspects of community (Source: Manzo and Perkins, 2006)

The distinction between social capital and place attachment is clearer. Woolcock and Narayan (2000) suggest that 'social capital refers to the norms and networks that enable people to act collectively', it is often attributed to communities, as an emergent quality of interactions between individuals, groups and organisations, although Brehm and Rahn (1997) illustrate that social capital can be identified at the individual level. Putnam (2000) describes two types of social capital: bridging and bonding. Bonding social capital refers to connections between individuals in relatively homogenous groups, such as within a family or religious sects. Bridging social capital refers to associations between distinct groups, such as between civic groups, trading organisations and governance organisations (Wolf et al., 2010). Although similar to sense of community and place attachment, social capital is framed as an asset arising from networks rather than an emotion. Research has demonstrated a link between place attachment and neighbourhood ties (Low and Altman, 1992; Kim and Kaplan, 2004; Lewicka, 2005). Social capital would appear to be an emergent quality of place-based relationships and community networks, with previous research suggesting it can be the link between place attachment and involvement in civic activities (Payton et l., 2003). Manzo and Perkins (2006) suggest that place attachment and social capital are in fact community assets and a lack of either can constrain public involvement in the planning process. There is limited empirical evidence on the connection between social capital

and place attachment, but it does suggest that social capital can play an important role in the way that place attachment manifests in behaviour.

2.3 Factors that affect relationship with place

The most commonly referred to predictor of place attachment is length of residence, or time spent in situ (Lewicka, 2005, 2011; Gustafson, 2009). However, this is not necessarily a direct, linear relationship. Lalli (1992) found that the level of place attachment increased most in the first year of residence and, after that, the increase in the strength of attachment with time was less significant. Indeed, different types of place relationships may develop at different speeds. When dimensions of place are split between attachment and identity, studies have showed that attachment develops faster or even independently of place identity (Hernandez et al., 2007). This could be because attachment to physical landscapes takes less time to establish than building social ties and memories in place that contribute to place identity.

Recreational studies have provided many examples of attachment to physical place such as national parks, rivers and trails (Warzecha and Lime, 2001; Williams and Vaske, 2003; Moore and Scott, 2003). Fewer studies however have compared physical and social elements of place attachment. Lewicka (2011) suggests that in most studies the most consistent predictors of resident's attachment are social variables; however, the physical characteristics of a place do play a role in place attachment. A large-scale survey in Phoenix found that place attachment was best predicted by length of residence, perceived control of the residence area and the orderliness and stability of the neighbourhood (Harlan et al., 2005). More attached residents of a city are also more likely to rate the physical characteristics of the city as more pleasant (Felonneau, 2004). The importance of physical features can be mediated by social variables; Freid (1984) found that objective physical features better predicted place attachment in richer sections of the population, but for poorer sections, social ties were a better predictor.

Closely correlated with wealth, although not always, are property rights and ownership. Homeowners are more attached to their houses than renters (Brown and Perkins, 2003). This stronger attachment can be demonstrated in willingness to take adaptive action in the face of a natural hazard; for example, homeowners are more likely to take action to prevent flood damage than renters (Carrol et al., 2009). This 'ownership effect', with the investment and association it entails, shows that people place more value on an item that is owned. In particular, houses that are owned are more likely to be fitted and filled with items selected by the owner (Carrol et al., 2009). However, the other side of this increased sense of rootedness and permanency is that when it is compromised by exogenous events, the sense of dislocation and violation can be relatively greater than for those who have set down shallower roots.

2.3.1 Age and place change

Evidence suggests that age affects how place is experienced (Hidalgo and Hernandez, 2001). Hummon (1992) suggests that sense of place plays an important part in identity formation over the lifespan. For adults, social factors are more likely to predict place attachment and for younger people place attachment is more likely to be predicted by the ability to achieve important life goals (Pretty et al., 2003). The gerontological literature emphasises the role of place in well-being for the elderly, older adults who have good relationships with place are more likely to experience a sense of control and a stronger sense of self (Golant, 1984; Peace et al., 2006; Wiles et al., 2009), the other side of this coin is that older adults are sensitive to, and are more likely to resist, place change (Sanders et al., 2004). In particular, as people age, the importance of place at the household level increases as it becomes the primary living space and homes act to compensate for reduced functionality (Oswald and Wahl, 2005).

Rowles' (1990) work on aging and attachment to place provides a useful framework for understanding how relationship with place can change with age. Rowles puts forward three different forms of 'insideness' to describe older adults attachment to place, this offers a useful framework in understanding how dimensions of place attachment develops over time: Physical insideness, social insideness and autobiographical insideness. These forms of relating to place contribute to feelings of belonging and well-being. Physical insideness refers to intimate knowledge of the landscape so that individuals navigate everyday terrains without much thought. Social insideness refers to integration with household members and in the wider community, for example daily routines between neighbours that cultivate a sense of belonging through participation with the community. Autobiographical insideness refers to the memories and personal history a person has with a place (Rowles, 1990). In older adulthood, physical limitations prevent exertion or the ability to carefully negotiate previously easily navigated terrains. As functional health declines, autobiographical insideness may take on a more salient role in well-being and the role of narratives can act to empower an individual in the face of stressful conditions (Smith, 2009; Tuohy and Stephens, 2012)

Place attachment varies over a person's lifespan, and places fulfil different functions depending on age. Research into place and older adulthood reveal a sensitive relationship that may vary contextually, but appears to be important universally for well-being. Even though this group have a heightened sensitivity to change there is relatively little research into how this group adapt to climatic change (Berrang-Ford et al., 2011). The importance of place for well-being in older adulthood throws into sharp relief the fact that older adults are particularly vulnerable to climate related change (Ahern et al., 2005, Hajat et al., 2005, Costello et al., 2009).

2.4 Why place attachment matters in adaptation to climate change

If adaptation is measured in structural and financial terms, policy makers risk overlooking the 'psychological, symbolic and particularly emotional aspects of healthy human habitats' (Agyeman et al., 2009). Chapter 1 and section 2.2 outline how place theory can offer new insight into adaptation, both in the motivations to adapt and the potential impacts. Adaptation measures that jar with people's relationship with place may reduce well-being. Place attachment may also be a resource to be harnessed when trying to ensure culturally sensitive adaptation; by understanding the significance of place, decision-makers are more able to ensure that the emotional and cognitive significance of place is preserved and bolstered (Davenport and Anderson, 2005). Place attachment and the research surrounding it may enable adaptation to climate change by encouraging civic behaviour (Gifford, 2011) and by revealing the meanings people attach to places, allowing for more informed decision-making processes (Devine-Wright, 2009). In terms of constraining adaptation, attachment to place may be undermined by climate-related events and changes in how places are managed; for example, changes in insurance coverage may shift how people feel about place.

2.4.1 How place attachment and understanding place attachment enables adaptation

The link between place and behaviour is ambiguous. Feeling strongly about a place will not necessarily result in engagement in place-related activity (Harmon et al., 2005; Gosling and Williams, 2010). Place attachment can influence preparedness for hazards (Mishra et al., 2010), however, mediating variables are sometimes necessary to connect place attachment with behaviour (Lewicka, 2005; Manzo and Perkins, 2006). It has been established that the attitude-behaviour link concerning environmental behaviour is weak at best, and professed attitudes are not often buttressed by analogous behaviour (Blake, 1999). The relationship between place attachment and behaviour

appears similarly nuanced. Lewicka (2005) found that neighbourhood ties served as a mediating factor between place attachment and involvement in a variety of social behaviours. Devine-Wright and Howes (2010) found that place attachment only gave insight into whether people would have negative feelings towards a wind energy project when levels of trust in key actors were taken into account. Mediating variables are important in connecting affective and cognitive bonds with place to place-related behaviour; however, studies do suggest that more strongly attached individuals are more likely to contribute to civic planning (Carrus et al., 2013). If emotional bonds to place are not taken into account, people can become immobilised by anxiety (Manzo and Perkins, 2006). Adaptation to climate change will mean place change for many communities (Adger et al., 2012b) and people's reactions to climate change will also entail place change (Devine-Wright, 2013). Place attachment, either directly, or indirectly through mediating factors, may motivate individuals to get involved in civic activities around adaptation planning.

Issues of justice and place have until recently been neglected somewhat by climate change literature. However, as set out by Adger et al. (2011), how individuals experience climate change will often be through its impacts on local places and justice issues are likely to emerge if adaptive action entails changes to places that have heterogeneous meanings attached to them. As discussed in section 2.2.2, places can be loci of emotions and sites of particular meanings for people. Differences in relationship with place between individuals and groups result in different reactions to potential environmental threats (Chamlee-Wright and Storr, 2009). In procedural terms, decisions about how public places are altered will involve some level of understanding of how places are significant to different elements of the population. Different opinions and narratives will have to be balanced against risk. Manzo and Perkins (2006) found that the act of listening to different groups' opinions about how a place should be altered meant that a compromise, even if it did not tally with what the group originally wanted, was more likely to be accepted. This suggestion reflects procedural justice research on social identity theory and the importance of being listened to as a way of boosting and reiterating social

identity (Tyler and Blader, 2003). Alternatively, if individuals are ignored, decisions may act to undermine self-perceived identity, which can cause discontent and unhappiness. Extending this to place identity, how you and your symbolic relationship with place are included in decision-making processes will also serve to acknowledge your relationship with place as important and worth listening to. If planners ignore the significance of place, this may lead to unhappiness and a feeling of loss of control. In Burley et al.'s (2007) analysis of coastal land loss in Louisiana, the most frustrating and disheartening aspect of poor land management for locals was that they were not listened to in management decision-making and instead suggestions from the scientific community were prioritised. Adaptation will entail managing place changes (Devine-Wright, 2013) and understanding place meaning and place identity will be important in ensuring the decisions are fair and supported by local communities.

2.4.2 How place attachment may constrain adaptation to climate change

Climate-induced change may be slow and incremental, or may happen in sudden shock events that force immediate adaptive measures to be taken. Either way, this will mean change for local places. Alongside this process, decision-making will also determine how places change – either through pro-active defensive structures, such as sea walls, or in reactive measures following a natural disaster, such as the reconstruction of buildings with built-in resilience measures (Devine-Wright, 2013). When extreme weather events happen they can tear away aspects of place that are deeply interwoven with an individual's or community's identity. This sudden dislocation of identity is uncomfortable, as people try most of the time (especially in the West) to maintain a fixed and coherent sense of self (Suh, 2002). Such a disconcerting experience can undermine capacity to recover after such events, both at the individual and community levels. On a collective level, displacement, dispersal or relocation can undermine a community's capacity to deal with problems and threats; civic involvement, an important aspect of adaptation to climate change,

can be undermined if place attachment is weakened (Hess et al., 2008). As Barnett and O'Neil (2011) suggest, resettlement, the most extreme answer to rising sea levels in low lying areas, may be a form of maladaptation if there are other options available. If relocation planning is not sensitively undertaken then new residential layouts can result in feelings of isolation and weakened social support (Speller and Twigger-Ross, 2009)

Indeed, strong place attachment and place identity can also introduce vulnerabilities, as established routines and narratives can, sometimes unknowingly, result in maladaptive behaviour (Wolf et al., 2010). Established place attachment and landscape values will be challenged as climate change introduces changes to terrain and weather (O'Brien, 2009). It will also challenge existing relationships with place, especially for individuals that have a close relationship with the natural landscape (Burley, 2010; Adger et al., 2011). In some instances the scale and pace of change will require a transformation of relationship with place, either through livelihood change or moving residence; however, where place identity is deeply engrained this may be a challenging option or an insurmountable task (Marshall et al., 2012). Where place attachment results in immobility, it may result in maladaptive behaviour. Place attachment and the narratives about place can constrain adaptation where people feel that the proposed change is not in line with the meaning people attach to place (Devine-Wright, 2009). A deepened understanding of place meaning will be important in providing as smooth transitions as possible for adaptation pathways, and overlooking place attachment may result in inappropriate adaptation policies where individuals are not psychologically equipped to deal with proposed changes.

One particular aspect of place attachment at the household level that may be tested by climate change in the Western world is the role of insurance (Mills, 2005). The frequency and intensity of hazardous events, such as flooding and hurricanes, will be affected by climate change and one of the ways these risks are managed is through insurance. It has been emphasised in the literature (Manzo, 2003) that positive place attachment is tied up with continuity and

rootedness. Even though insurance is a conceptual element of this security, it does have a significant impact, especially in hazard recovery. The impact of negotiating with insurance companies is one of the major traumas following a flood event (Tunstall et al., 2004; Harries, 2008; Carrol et al., 2009) and the knowledge that coverage has been rescinded affects how people manage their living space. Insurance companies can constrain how people replace lost items, and personal taste and control can be stymied by insurance company stipulations (Carrol et al., 2009). Additionally, it can make it harder to sell houses if flood insurance is necessary for gaining a mortgage. When adaptation takes place at the household level, insurance can play a significant role in providing security – and security is an important characteristic of place attachment at the household level (Easthope, 2004). How interactions with insurance companies are managed and whether coverage is provided is significant for well-being and for how individuals manage their homes to adapt to future risks (Carrol et al., 2009).

2.4.3 Reactive and Proactive Adaptation: the potential role of place

Adapting to environmental events that have been experienced and anticipatory adaptation to possible future events are processes that draw on different rationales and purposes. The set of tools applied in the recovery of an event, for planning for an imminent event, and for planning for an event that could potentially happen in the future will inevitably be different (Smith et al., 2000). As humans, we reflect differently on events behind us and events potentially emerging on the horizon (Van Boven and Ashworth, 2007).

Adaptations can be reactive or proactive (Carter et al., 1994). Proactive adaptation consists of action and processes put in motion prior to a perceived hazard or climatic change, it is often focused on collective action for the public good and is more likely to be carried out by governments than by individuals (Berrang-Ford et al., 2011). Reactive adaptation is action that is undertaken by actors (and also governments) during or following changing conditions to

maintain and restore welfare (Smith et al., 2000). As Lecoq and Shalizi (2007) highlight, the rationale for these two types of action are very different: planned adaptation uses resources now to prevent negative impacts in the future, while autonomous or reactive adaptation uses resources now to cope with events at the time that they occur. To expand on this, planned and reactive adaptation will also draw on different values and different capacities. What people feel is fair when adapting over time to a potential hazard and what they feel is fair to undertake during or after an event may change. Following an extreme event, for example, sense of place can achieve a level of articulate knowledge, as opposed to tacit knowledge that usually operates in the background (Chamlee-Wright and Storr, 2009). One issue highlighted in the literature is that the importance of place is not always salient for an individual and sometimes only when relationships to place change or are threatened does place attachment become significant (Burley et al., 2007; Chamlee-Wright and Storr, 2009). For example, it may not be obvious how important a local coffee shop is for chatting and socialising until it closes down, or the personal significance of a particular vista is only apparent when a new building blocks it from view. So, what values and aspects of place should we prioritise when we make plans to adapt to climate change? When we make reactive adaptation decisions, what aspects of place have become salient and what guides our decisions? This raises the question of how these valuations may compare and whether the differences offer opportunity for greater understanding. Does the same relationship with place attachment stand when we consider reactive and pro-active adaptation, and how do environmental disasters affect place attachment (Doherty and Clayton, 2011).

There is an implicit assumption in the literature that planned adaptation, with the time and consideration that its nature affords, is a better form of adaptation. Reactive adaptation can be ad hoc and messy (Brooks and Adger, 2005). Psychology has established that we are fairly inept at forecasting how events will impact on us emotionally. We tend to overestimate the impact events will have on our emotional state (Wilson and Gilbert, 2003).

Considering the different factors that people draw on to make decisions related to different temporal dimensions and stimuli, the question emerges as to whether there are issues around adaptation that only become active or consciously evident after a climate event has occurred. Ultimately, with respect to environmental risk, when people look forward and look backward, do they value the same things? Is there a possibility that, when making decisions about what to adapt to in the future, people fail to factor into their decisions social aspects of adaptation that may only become clear if a climate shock occurs?

2.4.4 Flood risk management in the UK

In the UK, one of the major impacts of climate change will be the increased risk of flooding and coastal erosion (HM Government, 2012). The meteorologically driven floods (such as those which occurred in the North West of the UK in 2009) may already be an example of climate-related natural disasters. The government has started to address the emerging problem with its *Making Space for Water* vision paper (Department for Environment, Food and Rural Affairs, 2005) and the Flood and Water Management Act (2010). Taking a longer view, predicted rising sea levels and increased storm occurrences will mean that low-lying land is likely to become increasingly vulnerable in the future. It took 30 years to build the Thames Barrier from inception to operation (only eight years were construction time); if the UK is therefore to be prepared to deal with future climate change, decisions about adaptation need to be made soon. In London this has been recognised with the launch of the Thames Barrier 2100 project (Dawson et al., 2005).

How different cultures decide to deal with the effects of climate change will be largely determined by where responsibility is set out in the social contract between the state and citizens (O' Brien, 2009). The ideology of past and incumbent governments shape pathways and infrastructure for how countries deal with a range of issues, including flood management (Botzen and Van Den

Bergh, 2008). In the UK the *Making Space for Water* document (2010) signalled a shift from large hard engineering defences to localised management of the problem and the suggestion of living with, rather than battling against, flooding. This change was driven by the recognition of the limitations of structural defences, the occurrence of a number of severe flood events and the acknowledgement that a more holistic approach was needed to align flood management with the demands of sustainable development (Johnson and Priest, 2008), see figure 2.2 for distribution of management for flood risk management in England.

Similarly, the distribution of funds to deal with flooding has also recently changed (Department for Environment, Food and Rural Affairs, 2011). The government will fully fund a few projects that will protect a large number of houses, it will then allocate part of the funds needed for a number of projects. Businesses and communities are required to make up the difference for the scheme to go ahead. The intention behind this is that instead of fully funding a small amount of projects, partnership funding will allow a larger number of schemes to go ahead. This political shift in flood management has allocated more responsibility to local authorities in dealing with flood management, as well as encouraging at-risk residents to consider making changes to their homes in order to reduce the impacts of floods.

The recent changes to the delineation of responsibility set out above are going to be increasingly important as there are currently one in six households in England at risk of flooding in the UK. The Environmental Agency believes that by 2035, as a result of climate change, the national Government will be spending approximately one billion pounds per year to protect citizens (Environment Agency, 2009a). Housing policy is also putting pressure on flood risk managers, especially in the South East; the government has suggested that 200,000 new homes should be built between 2004 and 2016 in the London Thames Gateway. Of these new homes, 120,000 are to be built in flood prone areas, or areas that may become flood vulnerable if predicted trends in sea level are experienced (Lewis and Kelman, 2009).

The Making Space for Water (2010) strategy indicates a shift towards accepting and encouraging adaptation to increased flood events, as opposed to keeping water out. Those vulnerable to flooding are not guaranteed that government-funded protection will continue and are being encouraged through legislation to be more proactive in making adaptive changes to flooding. By shifting control away from centralised systems, and to some extent ownership, to local communities, potential opportunities emerge for locally-evolved adaptation decisions. Local residents are able to influence local plans for flood risk management through engagement with local councils and the Environment Agency, either through dedicated consultation processes or through communication with local councillors (see figure 2.2). Individual residents can also engage with the political structure around flood risk management by joining local flood groups.

National policy and legislative setting	Legislation addressing flood risk and response is framed by the Flood and Water Management Act (enacted in 2010 after the floods) CCA (2004). Department for the Environment, Food and Rural Affairs (DEFRA) outlines national policy. The Environment Agency (EA) is responsible for flood forecasting and warning. It operates its own flood defence infrastructure. Planning Policy Statement 25 (PPS 25) gives the EA a role in determining planning permission in flood risk areas. Local Authorities: • Implement flood management works. • Manage planning permission and therefore development in flood risk areas (in line with Planning Policy Guidance 25). • Liaise with Local Resilience Forums on emergency planning. • Responsible for providing emergency shelter and food post-floods.
The role of the private sector	Insurance sector: Agreement between government and insurance sector.
Voluntary Sector	The roles of voluntary organizations are formally integrated into civil protection through the Voluntary Sector Civil Service Forum. At national level, groups with vested interest can lobby for change: for example, the Royal Society for the Protection of Birds (RSPB), Wildlife trusts, flood action groups. At the local level voluntary groups work with local government on flood risk planning; during a flood voluntary groups work with responders on warning and evacuation (Royal National Lifeboat Institution, RNLI); and post floods provide individuals with assistance (fe.financial, legal).
Individual capacity	Homeowners can: • Obtain flood insurance if the risk of flooding is no worse than 1 in 75 annual probability of flooding. • Make changes to their property to reduce the risk of flooding. • Move away from a flood risk area. • Participate in consultation processes regarding planning and flood defences. Individuals: can join local interest groups, contribute to fund-raising efforts, join charities, lobby councillors and members of parliament.

Figure 2.2: Critical elements of the social contract for flood risk management in England (Adapted from Adger et al., 2011)

With this shift of responsibility in mind, it becomes important to understand what might motivate or discourage adaptive action. One possible motivation for such action is relationship with place. Will attachment to place predict or shape participation at the local scale? Alternatively, will individualism prevail, leading adaptation to occur at the household scale with community projects left to a few motivated individuals?

2.5 Summary and Research Questions

Place attachment research has proliferated in the past 40 years (Lewicka, 2011). It is only more recently that place concepts have been used to frame climate change issues (Agyeman et al., 2012; Adger et al., 2011; Devine-Wright, 2013). I believe that place theory and data suggest two areas of particular interest for adaptation research: a need for a greater understanding of how place change and involvement in planning are related, and, secondly, how climate-driven place change affects place related meaning and how this affects adaptive capacity. Empirically, place has been tested for relationships with environmentally friendly behaviour and civic action (Payton et al., 2005), but data on the relationship with place and adaptation to risk is very limited, one example being Mishra et al.'s (2010) work of place attachment and adaptation to flood risk.

This chapter has described how climate change adaptation may be influenced by the psychosocial elements of individuals' relationship with place. Expanding adaptation framing to include place research helps to identify how place attachment and place meaning may act to shape, enable and constrain adaptation actions. Whether adaptation is proactive or reactive also affects what values and norms underpin adaptation options. This framing is particularly pertinent when we consider the role of place, given that place attachment and meaning sometimes only become self evident when individuals have experienced disruption. With the intention of making more explicit some

of the social processes that underlie adaptation this study will use a proactive and reactive framing to tease out the different ways place affects involvement in adaptation decisions, and will identify whether its role changes following a disruptive event. By introducing ideas around place to adaptation planning this study aims to test whether place may inform preferences for adaptation and what this may mean for involvement in planning decisions. As was highlighted in Chapter 1, the number one climate related risk in the UK will be flooding (HM Government, 2012). Flood risk will directly impact communities and entail place change as a result of adaptation action taken, and the direct experience of an event. Given the vulnerability of the UK to this risk, the shifting landscape of responsibility for flood risk in England along with the impact that floods can have on place, adaptation to flood risk is the focus of this study. These issues will be addressed through the framework of the three research questions listed below. For the purpose of this study, the places (and place meanings) that will be examined will be the towns of residence and the household. An additional line of investigation will consider the rivers that run through case study areas, and whether attachment to these as specific loci of meaning differ to the attachment to towns that they run through.

Firstly, this study will address issues of responsibility. To this author's knowledge, research has not been carried out to test whether place attachment to local areas is accompanied by a sense of responsibility relating to their management and protection. At the household scale, place attachment and identity is accompanied by a desire to control and manage the home environment (Carrol et al., 2009) and change in local places can lead to a loss of feelings of control (Burley, 2007). The first research question aims to address this empirical gap and has also been formulated in light of the fact that responsibility for flood management in England is becoming more decentralised and is increasingly falling onto the shoulders of local councils and citizens (Johnson and Priest, 2008). Involvement in adaptation decisions is being framed in terms of increased responsibility for citizens, this research question will address whether relationships with place will make acceptance of such responsibility more likely.

The second research question builds on work that has identified links between place attachment and behaviour (Lewicka 2005, Manzo and Perkins, 2006). This question will test whether attachment to a place makes it more or less likely for individuals to be involved in flood risk management decisions in their towns. The reactive and proactive framing will also offer insight into whether the increased salience of place following a flood (Chamlee-Wright and Storr, 2009) makes active participation in flood management decision more likely.

The final research question shifts the focus from strength of place attachment to place related meaning. Building on research that highlights the importance of understanding place meanings in the face of place change (Speller and Twigger-Ross, 2009), this question asks what are the impacts that floods may have on place meaning at the household and town scale. The second part of the question turns the focus to older adults, a section of the population that is particularly sensitive to place change (See section 2.3.1) and are currently under-studied in the adaptation literature (Berrang-Ford, et al., 2007).

1. Do relationships with place predict expected distribution of responsibility in proactive and reactive flood risk management?

2. Do relationships with place predict participation, or planned participation, in adaptation decisions in proactive and reactive flood risk management planning processes?

3. How does a flood event affect perceptions of place (at the house and town/village scale) for flooded and non-flooded households? (with a particular focus on older adults)

Chapter 3: Methodology

3.1 Introduction

This chapter describes the methodology adopted in this work and the methods used to collect and analyse the data in this thesis. Based on the literature review, I argue that a mixed methodology approach allows for the best understanding of the variety of ways relationship with place can be affected by flood risk, and of how place measurements relate to adaptive behaviour. The choice of the UK as a case study is explained and the two study areas within the UK are described. The qualitative and quantitative methods used to answer the three research questions (including sampling strategy, survey and interview protocol design and administration) and methods of analysis are detailed.

3.2 Choice of methodology

The literature reviewed in Chapter 2 illustrated the range of approaches in place research; often the research is broken down into quantitative research that focuses on relationships with place, and qualitative work that focuses on place meaning (Lewicka, 2011). The quantitative approaches usually centre on using place scales as a way of capturing different aspects of place relationship (identity, attachment and dependence), while the qualitative work uses focus groups and interviews to gain an understanding of place meanings.

The quantitative research is usually focused on measuring place as a locus of attachment and it is the strength of the bond between the individual and the place that is quantified, usually using Likert scales with several items that capture different facets of place. The relationships can then be tested for correlation with a variety of beliefs and behaviours such as environmentally responsible behaviours (Scannel and Gifford, 2010), or support for protected

areas and wind development projects (Carrus, et al., 2005; -Wright and Howes, 2010). The focus of this approach is therefore on the strength of people's relationship with place, how this may differ between groups and how this relationship links with other place-related emotions or behaviour. This approach is derived from work in environmental psychology and leisure research (e.g. Williams and Roggenbuck, 1989; Stedman, 2002; Kyle et al., 2003).

Qualitative place research, such as in-depth interviews, focus groups, pictorial measures and free association tasks, can provide a different understanding of place, namely the meanings individuals attach to certain places (Lewicka, 2013). In discursive work, the focus is on how place is actively created and maintained through discourse and narratives (Dixon and Durrheim, 2000). For this tradition, the focus is on the stories and meaning making involved in discussions around place. This research is informed by health and environmental psychology literature (Carrol, et al., 2009; Devine-Wright and Howes, 2010).

Both qualitative and quantitative approaches offer useful methods of understanding and researching place. Patterns in the prevalence of relationships between place attachment and other processes can be identified and analysed. Sometimes quantitative dimensions of attachment can overlook the different reasons underlying bondedness with place and the meanings different people attach to places (Gustafson, 2013). The qualitative work focusing on the meanings attached to places and the discursive practices around them, usually allows for a greater understanding of why people develop attachments to different places and what may cause certain attachments to grow stronger or weaker. This duality of place research is clearly described by Williams:

> *To begin to clarify the methodological challenges in place attachment research it is helpful to distinguish two uses of the term place attachment. One refers to a specific operational construct designed to measure the*

emotional intensity or strength of attachment (place described as a locus of attachment). The other refers to the broader psychological processes of attachment formation and meaning making (place described as a center of meaning) (Williams, 2013: 91).

For these reasons, a multi-method study adopting both qualitative and quantitative approaches can offer a broader insight than either applied on its own, when studying people's bonds with places (Lewicka, 2011). Therefore, in this thesis, to address the first two questions (centred on the relationship between place, attitudes and behaviour) a predominantly quantitative approach is most suitable. The third question addresses how place meaning may change, with a qualitative approach being most appropriate for this.

Furthermore, using qualitative and quantitative approaches allows different aspects of place to be investigated and each of the approaches can inform each other during the different phases of analysis (Langhout, 2003; Devine-Wright and Howes, 2010). For example, flooded residents in Cockermouth, England demonstrated a similar level of attachment to their town as non-flooded residents, but the characteristics they attributed to their town were different; the qualitative interview data generated possible reasons for this finding (this is addressed in more detail in section 6.2).

However, the combination of these approaches is not without its explanatory limitations (Silverman, 2001). It has been argued that quantitative and qualitative studies on place cannot be fully commensurable; Williams suggests as an alternative that a critical pluralist approach may be the most useful in place research, as it is unlikely that one research approach will be able to comprehensively capture all of the facets of place and "bring them together into one view reality" (Williams, 2013: 97). The analysis of this data takes these limitations into consideration and seeks to use quantitative and qualitative approaches appropriately; whilst they are not commensurable, each approach can inform the other through cross analysis (Gu and Ryan, 2008; Devine-Wright and Howes, 2010).

As described above, the first two questions in this thesis were researched using a quantitative approach to test whether there is a significant relationship between bondedness with place and i) expectation around flood management responsibility and ii) flood management behaviour. As with other place research that tested how relationships with place correlate with attitudes and behaviour, surveys were employed, as they are one of the most effective means of gathering this type of information (Lewicka, 2011). The surveys also included open-ended questions that provided some space for qualitative answers, allowing for more in-depth insight into the meaning people attach to their towns. The main focus of the surveys was to quantify the emotional bond between residents and their towns, and to test whether these bonds relate to specific elements of flood risk management.

The third research question requires a shift of focus from measurable aspects of place and causal relationships, towards trying to understand the meaning attached to places and how such meanings may develop. In order to address this question, the methods needed must be able to focus on the understanding and interpretation of places and place meanings. As Blaikie states, an interpretivist approach is

"concerned with understanding the social world people have produced and which they reproduce through their continuing activities. This everyday reality consists of the meanings and interpretations given by the actors to their actions, social situations, and natural and humanly created objects" *(2000:115).*

Qualitative in-depth interviews offer this level of insight, whilst also allowing the research to be somewhat participant-led – interview instruments do determine the overall structure, but the conversation is led by the interviewee and only re-directed by the interviewer when the conversation moves well beyond the scope of the research (Mason, 2002). The focus of these interviews is not to measure the emotional bond between residents and place, but to determine what house and town mean to these interviewees, and whether the experience of a flood has affected how place is perceived or experienced.

In order to address these three research questions, two study areas were selected: one to study the reactive flood management process, and one to study the proactive flood management process. The rationale for this comparison is set out in Chapters 1 and 2. In all locations, the Environment Agency had proposals in place for structural flood management options (See Environment Agency, 2009b for details of the project in Barnes and details of the Cockermouth project are illustrated in figure 3.3). In the UK the Thames Estuary was the first flood risk project to put climate change at its core, and one of the few to take such a long-term view of flood risk management. The selection of the flooded site was informed by recent flood events and local knowledge from previous fieldwork by the author (Adger et al., 2012a).

The decision to select Barnes for the Thames Estuary site was informed by the expected increased risk of flooding in West London in the coming century and the characteristics of the area (described in further detail in section 3.3.2). In Cumbria, Cockermouth was the town most extensively affected, floods affected both the main street and residential areas in 2009. This meant that the floods had an impact both on people flooded in their homes and those who were not.

The reason for sampling both the flooded and non-flooded population is that that direct experience of a flood may make certain aspects of place and place related processes more significant (more details of this site are given in section 3.3.2.1). Additionally non-flooded residents are able to contribute to planning decisions, comparing and contrasting their experiences and their behaviour will increase our understanding of the impacts of being directly impacted by a flood. The in-depth study with its focus on older adults was carried out in Keswick, a town approximately 13 miles from Cockermouth. The impacts of the floods were less extensive here, but the elderly population make up a large proportion of the population and in Keswick, unlike in Cockermouth, a nursing home was closed as a result of the flooding (See figure 3.1 for demographic details). Issues around the interaction between older adult vulnerability and flood risk were particularly salient there. For these reasons, this town was selected for the interviews, and the findings complemented the survey results generated in Cockermouth. Again, both flooded and non-flooded residents were interviewed as planning discussions were open to those directly and indirectly affected by flooding (for more details, see section 3.3.2.1).

3.3.1 Cumbria

The study area for the proactive planning process was the Cumbrian region, with a focus on the 2009 floods. These floods occurred at the beginning of the author's PhD study period and affected a large enough population to enable this to be a geographical focus of the research. Additionally, it meant that the fieldwork could be carried out at a time when flood management decisions were being made in the towns affected. An atmospheric river had developed by mid-November 2009 resulting in record-breaking rainfall between 16–20 November in Cumbria (Lavers et al., 2011). The flooding in Cumbria had a return period of 2,100 years (Miller et al., 2013). Across Cumbria, 1,794 residential properties were flooded, with 63 per cent of affected groups being from older social groups (Cumbria Intelligence Observatory (CIO), 2010). The floods reached 1.5 metres in depth, and although floods had been experienced

in 2003 and 2005 the geographic scale and impact of the 2009 event was unprecedented with previous events mainly affecting the Gote Road area in Cockermouth.

3.3.1.1 Cumbria research sites: Keswick and Cockermouth

The breakdown of vulnerable groups in this county showed that of the population directly affected by flooding, a disproportionate number were older adults – approximately 63 per cent of the residents flooded were from older social groups which make up 17 per cent of the wider population in the county (Cumbria Intelligence Observatory, 2010). Older adults have been identified as particularly vulnerable to flood risk in the literature (Sharkey, 2007) and the statistics provided by the Cumbria Intelligence Observatory illustrates that this group was particularly exposed to the 2009 flooding.

As described in Chapter 2, this particular demographic will become larger due to the general trend for ageing populations in developed countries, including the UK (Harper, 2006; Quinn and Adger, 2011). The vulnerability of this cohort and the exposure revealed by data on flood-affected populations in Cumbria meant that this was a particularly pertinent group to study with respect to understanding how adaptation to flood risk is acted on and perceived

Population: Total 5,243

Age	Number of people
16-24	426
25-44	1,150
45-64	1,548
65-74	640
75+	733

Employment

Economically active	3,764
Employed	2,506
Unemployed	92
Student	100
Retired	736

Tenure (2,370 households)

Owned	1,522
Social rented	87
Private rented	232
Living rent free	56

Figure 3.1: Socio-demographic details for Keswick (Office for National Statistics, 2014)

Keswick Flooding: November 2009

Source: The Environment Agency

Scale: 1cm: 0.15km

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Figure 3.2: Map detailing extent of November 2009 flood in Keswick, Cumbria (Cumbria Intelligence Observatory, 2010)

3.3.1.1 Cumbria: Cockermouth

Cockermouth was selected as an area for quantitative fieldwork that took the form of a survey, with a specific focus on adaptation (reactive) as it had experienced flooding in November 2009. Like Keswick, Cockermouth has a large pensioner population with pensioner households making up 29.2% of the 3,515 households in the town (Allerdale Council, 2011). The earlier 2005 flood event led to the creation of the Cockermouth flood action group that has had a very visible role in shaping flood plans for the town. The disruption extended beyond those directly affected with roads cut off (three road bridges were lost), travel times were severely disrupted, GPs and the police also had to shift the operating bases in Cockermouth and tourist businesses suffered from reduced access (CIO, 2010). The flooding affected 691 residential properties in a town with 3,314 properties (see figure 3.5 for further socio demographic details) and 80 per cent of businesses in Cockermouth were affected, tourism was particularly affected with ten tourism businesses reporting damages in excess of £100,000 (Cumbria Intelligence Observatory, 2010). The main street was closed for a week, with rebuilding continuing for months following the floods.

The number of flooded households in Cockermouth meant that it was the site in Cumbria that offered the largest potential sample of flooded residents. The floods demolished and damaged two road bridges in Cockermouth, causing them to be closed and destroyed a key footbridge (Cumbria Intelligence Observatory, 2010). At the time of the fieldwork, the Environmental Agency was consulting with residents about proposed flood management options, details of which are illustrated in figure 3.4. The main focus of the discussion were the proposals for raising the height of defences along Rubby Banks Road, a road used by the community, near the centre of town that runs alongside the River Cocker. The possible options included raising the brick wall, building a glass extension on top of the current floodwall, or building a retractable wall that could be raised when the water levels in the river rise. During the fieldwork period, the Environment Agency held an information weekend (11/12 November 2011) in one of the shops in the town centre to discuss these

options with interested residents. The response to this event was incorporated into the planning process and contributed to the selection of a self-raising wall for the flood defences along Rubby Banks Road.

Cockermouth Flooding: November 2009
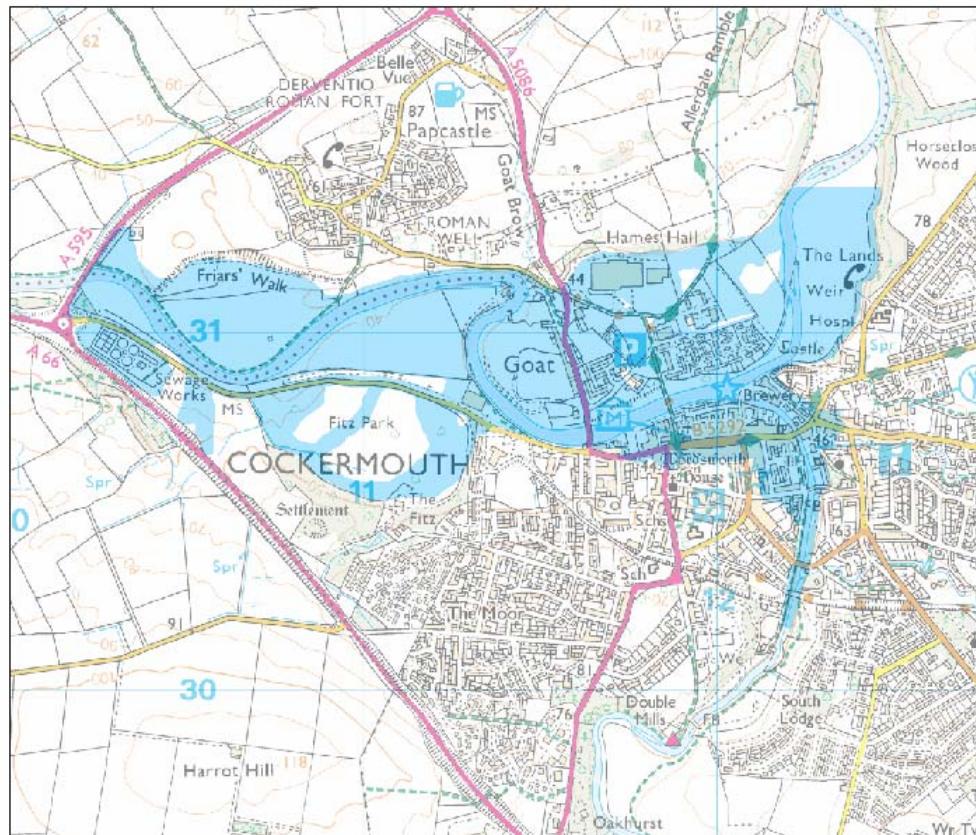
Source: The Environment Agency   Scale: 1cm: 0.15km

This produce contains mapping data licensed from Ordnance Survey © Crown Copyright 2009. Licence Number 100019596.

Figure 3.3: Map detailing extent of November 2009 flooding in Cockermouth, Cumbria (Cumbria Intelligence Observatory, 2010)
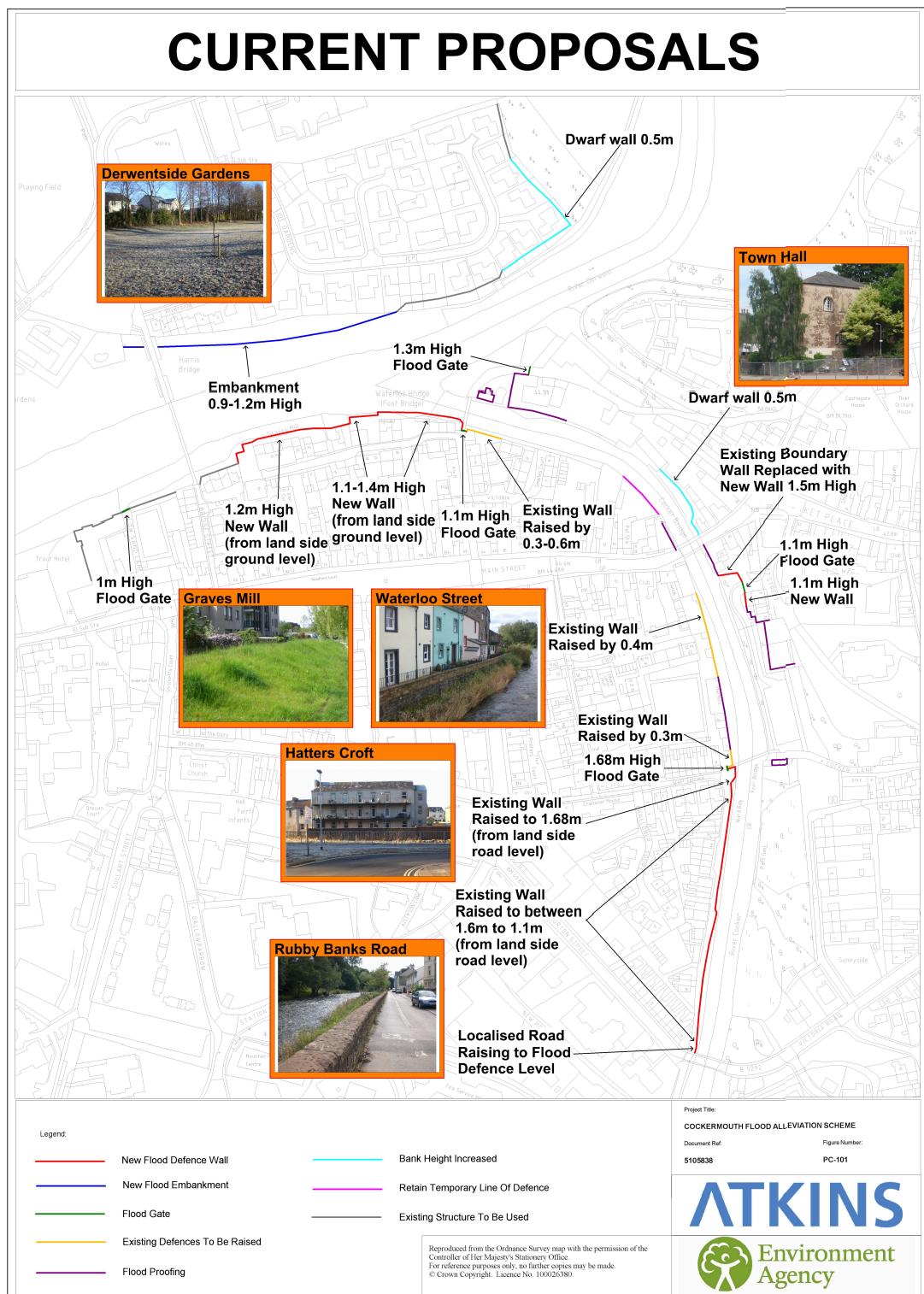
Figure 3.4: Environment Agency proposal for flood management in Cockermouth in November 2011

Population: Total 7,948

Age	Number of people
16-24	1,099
25-44	1,548
45-64	1,819
65-74	1,333
75+	899

Employment for those of working age (household representative person, total: 4,664)

Economically active	3,677
Employed	3,409
Unemployed	136
Student	77
Economically inactive	987

Tenancy (3,314 households)

Owned	2,588
Social rented	543
Private rented	265
Living rent free	64

Figure 3.5: Socio-demographic details for Cockermouth (Allerdale Council, 2011)

3.3.2 Thames fieldwork site: Barnes

Barnes is part of the London borough of Richmond and has a population of 10,299. It is a relatively green area of London (99% of the area is within 400m of a local open space) and is bounded by the Thames on the Northern, Eastern and Western limits. The Thames towpath runs along these limits and often floods during periods of heavy rain (Environment Agency, 2009b). Barnes does not have a history of flooding but nearby Hammersmith experienced flooding in 2010. An issue that was high up the agenda of local residents at the time of the survey was opposition to plans to put a construction site for a 'super sewer' in Barnes, a cause behind which many local people were gathering. Most of Barnes' residential area and Barnes village is situated in the flood risk zone, a significant flood event would not only affect directly flooded households but

would threaten the commercial viability of the village centre and the day to day lives of residents within its sphere of influence. A flood event would likely cut off access to the bridge connecting Barnes to Hammersmith, affecting travel times and access to services.

Barnes is part of the Barnes and Kew policy unit, one of the 23 units that make up the Thames Estuary 2100 (TE2100) project (See Environment Agency, 2009b for details). The TE2100 extends from Teddington in West London through to Shoeburyness in Essex and Sheerness in Kent; it encompasses 500,000 homes and 40,000 non-residential properties and is the first major flood risk project in the UK to have put climate change at its core (Environment Agency, 2009b). The project has been split into three phases defining the timeframes during which specific action on flooding should be taken: the first 25 years, (2010 to 2034), the middle 15 years (2035 to 2049) and the final years up to the year 2100 (from 2050 onwards). Public consultations were carried out between April and July 2009 across the spatial area covered by the project and residents in Barnes were consulted as part of the Thames Estuary Project on 10 June 2009 at an information evening held by the Environment Agency.

Several factors contribute to flood risk in Barnes (See Environment Agency, 2009b for details):

- The tidal risk upriver of the Thames Barrier and potential flood depths of two metres, should the Thames Barrier fail.
- The fluvial risk upriver of the Thames Barrier with a probability of 0.1 per cent per annum.
- The fluvial risk from Beverley Brook that could be exacerbated by tide lock with a probability of 10 per cent per annum.
- Local drainage issues and groundwater flooding.

Barnes was chosen as the location to explore proactive flood management, as future management of the Thames Barrier means that the flood risk is likely to

increase in West London in the coming century. An informal phone conversation with a member of the Environment Agency team highlighted this area of London as particularly vulnerable to the issue of tide lock: as the Thames Barrier is used to prevent tidal flooding but also to prevent the effect of high tides combining with high river flow in West London, the increased usage of the barrier means that it will not be able to be used for this function as frequently in the future and so the risk of flooding in these areas is likely to increase.

The focus in this thesis on proactive flood management meant that areas that had experienced flooding were not eligible for study, ruling out Twickenham and Hammersmith. Although the riverside often floods in Barnes, cutting off walkways, it does not flood households. An additional consideration for the work undertaken in this thesis was the comparability of the two fieldwork sites. Barnes offered the least industrialised or cosmopolitan site in the West London area and an example of where proactive adaptation to flooding is being considered (see figure 3.6 for socio-demographic details). Nor are there any underground networks or major retail centres that would provide a basis for commercial or infrastructure-focused flood management – the main drive for flood protection would be residential use and the village centre. During the consultation process in 2009, several possible options were put forward by the Environment Agency to manage flood risk in the Barnes and Kew policy areas; these mostly involved remodelling of the river frontage, see figure 3.4 for an example (see Environment Agency, 2009b for details of proposals).

Population: total is 10, 299 in a total 4, 296 households.

Age	Number of people
16-24	864
25-34	1,430
35-54	3,223
55-64	1,155
65-74	796
75+	679

Employment (household representative person, total: 4,296)

Economically active	3,186
Unemployed	92
Student	31
Retired	835
Looking after family or home	66
Sick or disabled	107

Tenancy (4,296 households, with 8,933 people living in share households)

Owned	2,470
Social rented	771
Private rented	975
Living rent free	68

Figure 3.6: Socio- demographic statistics for Barnes (Office for National Statistics, 2014)

Legend

Policy Unit limit on estuary	▬▬▬ (yellow)
Policy Unit boundary (approx.)	▪▪▪▪ (blue)
Raise primary defences on the existing line	▬▬▬ (red)
Raise or locally realign primary defences	▬▬▬ (orange)
Potential local flood storage	▪▪▪▪ (green)

Map 10: Hammersmith, Barnes & Kew, Twickenham, Richmond

Thames Estuary 2100

Hammersmith Policy Unit

Twickenham Policy Unit

Barnes & Kew Policy Unit

Richmond Policy Unit

Beverley Brook: Improve outfall, local flood defences and possibly local flood storage

Raising of tidal defences (including Brent) for Options 1, 2 and 3.

No raising of defences for tidal flood risk in Option 4.

Figure 3.7: Overview of flood management options in the Barnes and Kew policy unit. (Environment Agency, 2009b)
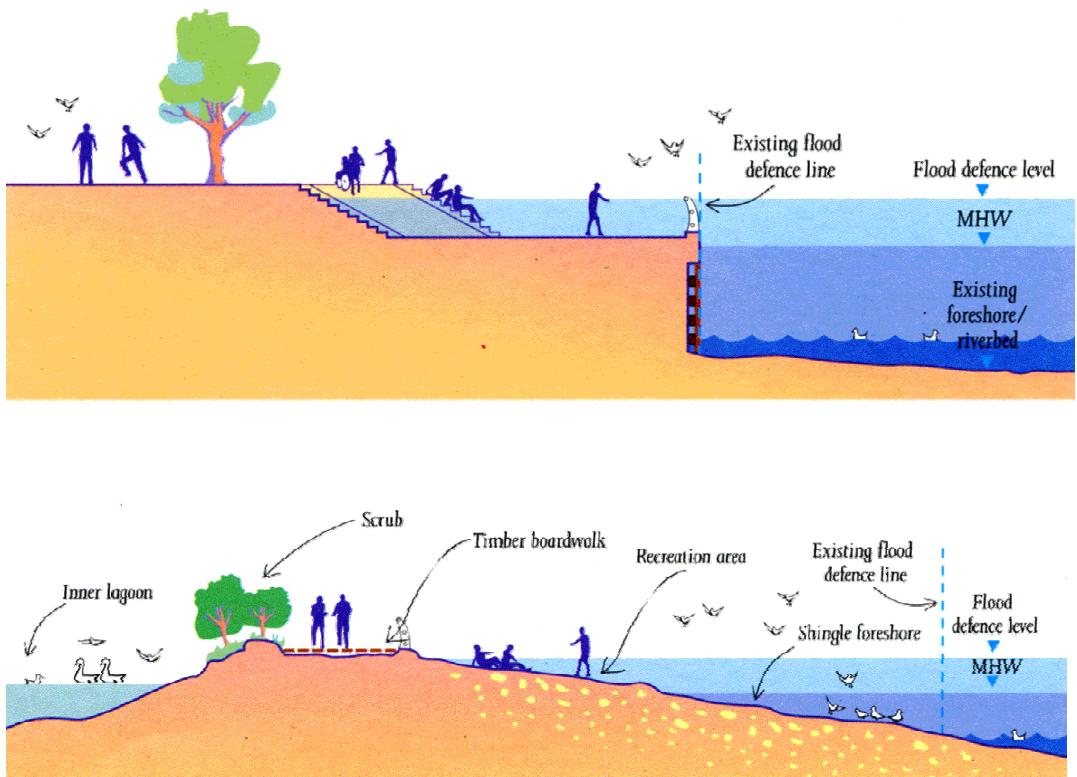
Figure 3.8 Possible flood management options for the Barnes area as part of the TE2100 project (Environment Agency, 2009)

3.4 Interview sampling and analysis

A mixed methods approach was used to address the three research questions. In total, 380 surveys were carried out across the two study areas, and within the Cumbria study, 14 interviews were carried out. A breakdown of the data collected is given in the table below (table 3.1).

	Thames Region	Cumbria	
	Barnes	Cockermouth	Keswick
Surveys	200 surveys were carried out face-to-face with those living in flood risk zones in July and August 2011.	180 Surveys were carried out face-to-face with residents in October and November 2011.	
Interviews			14 in-depth interviews were carried out with flooded and non flooded resident in Keswick in March 2011

Table 3.1: Overview of quantitative and qualitative research carried out

The qualitative interviews were carried out first. This ordering of qualitative before quantitative fieldwork was done so that (a) an understanding could be gained of the meanings people attach to places and flood, and (b) results from the interviews could inform the structure of the surveys, with the possibility of measuring place meanings as generated in the interviews, as well as the strength of place relationships in the survey. Through this process, it was envisaged that the third research question would be more fully addressed, based on both findings of the interviews and the survey (i.e. from the quantitative and qualitative streams of the research).

To gain a deeper understanding of how flood risk and relationship with place may shape adaptive behaviour, this study focused only on one of the towns that were flooded in Cumbria in November 2009, namely Keswick. In particular, the interviews aimed to understand how flooding could affect the meanings people attach to place. Qualitative interviews offer the best methods for exploring this, as outlined above (section 3.2). When using qualitative interviews the sample needs to be large enough to cover all the important points that may arise, but after a certain number of interviews, the same points emerge and no new themes are noted – i.e. data saturation has been reached (Mason, 2010). The more homogenous the sample, the more similar the experience of the interviewees and the smaller the sample needed to reach saturation point (Guest et al., 2006). Time and financial limitations meant that for the qualitative

element of this research to generate the most useful findings possible, a specific demographic was purposively sampled for participation in in-depth interviews, as place attachment can vary with age (Hidalgo and Hernandez, 2001; Pretty et al., 2003). The results of these interviews are age specific, but are also useful in providing an understanding of the possible mechanisms through which relationships with place may change for the wider population following a flood event. Thus, given the particular vulnerability to the experience of and response to flooding by older adults (Ngo, 2001; Hajat et al., 2005), individuals within this demographic were chosen as the study population.

The interviewees for the in-depth interviews with older adults were purposively sampled and recruited through knocking on doors in flooded and non-flooded areas in Keswick. For non-flooded interviewees, roads near to the town on relatively flat areas were selected so that they were not significantly different in geographical layout to the flooded area. The sample of people flooded in Keswick was small, so all eligible residents who agreed to be interviewed were included in the sample. The selection process for non-flooded interviewees was slightly different as the potential sample size was much larger. As such, when a resident agreed to be interviewed, the next three houses were skipped, and the fourth house along was approached to test eligibility and willingness to be interviewed. This was to ensure that the non-flooded sample was representative of the residential area close to town.

Seven flooded and seven non-flooded residents were interviewed in Keswick (details listed in table 3.2). The interviewees were given a consent form prior to the start of the interview that they read and signed (See appendix 1), and all interviews were recorded and transcribed verbatim. An interview protocol was designed to guide the interviews and following the first two pilot interviews, was modified slightly to ask specific questions about living in Keswick in order to ease the residents into the interviews (See Appendix 2 for final interview protocol). The interviewees were asked what brought them to Keswick and how they would describe it in order to understand what meaning the town held for the respondents. The rest of the interview focused on the impacts of the floods at the house and town scale and addressing how the floods may have

affected attachment and place related meaning at the town and house scale may have been affected by the floods. The interviews were participant-led as much as possible, and prompts were only used if the conversation diverged significantly from the protocol. The interviews were carried out in March 2011.

Participant	Age (years)	Sex	Length of residence in Keswick (years)	Flooded or Non-flooded
A	66	Male	11	Non-flooded
B	80	Male	37	Flooded
C	73	Female	37	Flooded
D	75	Female	21	Flooded
E	79	Female	23	Flooded
F	75	Male	32	Non-flooded
G	73	Male	50	Non-flooded
H	73	Male	73	Non-flooded
I	80	Female	45	Non-flooded
J	76	Male	17	Flooded
K	79	Female	40	Non-flooded
L	80	Female	28	Non-flooded
M	82	Male	23	Flooded
N	86	Female	23	Flooded

Table 3.2: Details of interviewees in Keswick

An inductive thematic approach was used to analyse the interviews. Initially, a descriptive approach was used for the coding, reflecting the explicit terms and meanings used by the interviewees, and the codes were subsequently analysed and more interpretative codes were used (Braun and Clarke, 2006). All the interviews were transcribed verbatim and read through twice to familiarise the researcher with the data. Initial codes of a descriptive nature were made in the margin of the transcripts and the transcripts were read through twice so that findings from each interview could inform coding for other interviews. The codes were then considered alongside each other and arranged into themes; relationships between codes and themes were considered and analysis was more interpretative than descriptive, with the wider literature also informing the creation of the ordinate and superordinate themes. At this point, the transcripts were re-read to consider whether the themes would work across

the whole data set, and the final structure of themes was then refined and established.

3.5 Survey design

The surveys began by asking about general characteristics of the local area before introducing specific questions concerning perceptions and behaviours. These questions were built on the findings of other place research (Williams and Vaske, 2003; Brown and Raymond, 2007; Devine-Wright and Howe, 2010) and research carried out by the author in 2010 in Cumbria that related to the 2009 flood event (Adger et al., 2012a). The survey also included open-ended questions on social capital and place change. However, some questions that proved ambiguous or difficult to answer were removed. The survey design varied slightly between the two locations to include extra questions in the Cockermouth survey that address issues of flooding (Both surveys can be found in Appendix 3). The sub-sections below outline some of the items included in the survey in more detail.

3.5.1 Strength of relationship with place and meanings attached to place

The investigation of place-related meanings was not confined to the qualitative interviews. A free association task was given near the start of the surveys, asking residents what three characteristics first came to mind when they thought of Cockermouth (as used in Devine-Wright and Howes' 2010 study of place attachment and wind farms). This question was included to capture quantifiable aspects of place meaning before addressing the strength of place attachment. Although this method of measuring place meaning is limited, it does add another layer of data and understanding for analysis.

There are a variety of methods of measuring relationship with place as detailed in the psychological and sociological literature and discussed in Chapter 2. Many of these methods focus on psychometric variables and the length of residence. Some studies use one or two items in a survey to measure place

attachment (Dallago et al., 2009; Korpela et al., 2009) but most use Likert scales. Social capital indicators were also included, as they have been demonstrated to act as a mediating variable between place attachment and civic action (Lewicka, 2005), and because analysis of the qualitative interviews suggested that relationships with neighbours and family were instrumental in flood recovery and interpretation.

Social capital and place dependence were measured using two variables each. Place dependence measurements were not included in the broader relationship with place variable as it is recognised in the literature that place dependence does not often act in the same way as affective aspects of relationship with place (namely place identity and attachment); rather, it acts more as a measure of place utility (Williams et al., 1992). Social capital indicators were included in the surveys to capture neighbourhood ties as an aspect of place, captured by the two indicators (a) and (f) (table 3.3).

Place Statement	Aspect of relationship with place
a) Barnes (Cockermouth) is very special to me (Williams and Vaske, 2003).	Attachment
b) I imagine that living near the Thames (Cocker) is like living near any major river.	Dependence
c) This is a close knit neighbourhood.	Social Capital
d) There isn't anywhere else I could live that would provide the facilities that I have access to in my area.	Dependence
e) I identify very strongly with Barnes (Cockermouth) (Williams and Vaske, 2003).	Identity
f) I trust my neighbours to look out for my property when I'm not around.	Social Capital
g) Living in Barnes (Cockermouth) says a lot about who I am (Williams and Vaske, 2003).	Identity
h) I have a lot of fond memories of my time in Barnes (Kyle et al, 2005).	Attachment
i) I identify strongly as being a Londoner (no equivalent in Cumbria) (Williams and Vaske, 2003).	Identity
j) The Thames and the riverside are very special to me (Williams and Vaske, 2003).	Identity

Table 3.3: Constituent elements of sense of place (If phrases were adapted from other place research the origin is stated).

The meaning-mediated model of place attachment that Stedman (2003) proposes emphasises the importance of the meaning people attach to physical places. As well as considering the strength of place attachment, identity and dependence (Q7 in Cockermouth and Q6 in Barnes), a question was included that asked about the importance of the different values that residents attach to the river in their towns; these values were adapted from Brown and Raymond's 2007 work on landscape values and place attachment (see Table 3.4). This was to determine whether the particular values residents attached to the rivers – the different meanings the rivers had for residents – correlated with their relationship with place, or if these values led to involvement in decisions made about flood management that would affect the rivers and riversides.

Value Statement	Value
I value the riverside for the attractive scenery, sights and sounds.	Aesthetic
I value the river and the riverside because of the opportunities for the recreational opportunities it offers.	Utility
I value the river and riverside because of the history it holds and the heritage it has.	History/Roots
I value this area because it helps me feel better physically and mentally.	Spiritually

Table 3.4: Value statements about rivers and riversides included in survey

Residents were also asked about which facets of flood management are important when making decisions as to what action should be undertaken or what structures should be put in place. The different facets of flood management were drawn from previous fieldwork experience undertaken in Cockermouth in 2010, from the pilot surveys and from the qualitative interviews (see table 3.5). These items were included to explore whether relationship with place would correlate with certain preferences such as aesthetics and access to the river, or whether preferences for monetary

considerations covaried with affective relationships with the town. In other words, the aim was to investigate whether relationship with place would affect priorities for how the type of flood management might affect the place, or whether this relationship did not impact, or was not strong enough, to shape flood management preferences.

Facet of flood management
Cost of defences
Impact of defences on how the local area looks
Impact of defences on access to the river
Impact of defences on ecology of the river
Impact of defences on local house prices
Ability of defences to reduce flood risk
Ensuring that all residents are defended equally
Ability of defences to reduce insurance premiums for local residents

Table 3.5: Flood management priorities to be rated by importance by respondents as featured in the surveys

3.5.2 Trust in actors, distribution of responsibility and perception of collective efficacy

Trust in the role of society and government may imply that householders do not undertake protective action, as they feel protected and reassured by the

physical presence of flood protection   and trust the relevant bodies to carry out their duties (Terpstra, 2011). Trust also acts as a mediating variable between place attachment and attitude to place, specific developments and civic action (Payton et al., 2005; Devine-Wright and Howe, 2010). The possible role of trust as a mediating factor meant that a question was included in the survey to determine the extent to which respondents agreed or disagreed that they trusted a number of relevant bodies (context-specific) to manage flood risk in their area on a scale of 1 to 5, 1 being 'strongly agree' and 5 being 'strongly disagree'. The issue of expected distribution of responsibility is the focus of research question 2, and was addressed using the same scale and by asking whether respondents agreed that listed actors were responsible for flood risk management in the next 25 years. This question included the same actors listed in the trust question, except with the addition of homeowners (See appendix 4 for survey outline).

Involvement in the decision-making process, either directly or indirectly, may also be impacted by the perception of collective efficacy. Additionally, place attachment, and more specifically place identity, may relate to the perceived efficacy of local people in making decisions that affect their local area. For this reason, a question was included that asked residents to state the extent to which they felt local residents could influence decisions about flood management in their area on a 5-point scale, from 'strongly influence' to 'no influence'.

Involvement in the planning process was measured by asking residents in Barnes their willingness to undertake five different five different actions relating to flood management decisions (See table 3.6). In Cockermouth residents were asked which of these actions they had undertaken with respect to flood management in their town. A range of actions were included in order to capture the range of processes through which residents could influence planning decisions about flood management in their areas.

Actions taken to influence decisions about potential flood management
Set up or sign a petition
Attend a meeting held by the environment agency
Join a flood action group
Contact a local councillor
Attend meeting held by local council
Other

Table 3.6: Actions that respondent may be willing to take, or have undertaken, with respect to flood management in their area.

3.6 Survey sampling and administration

The survey was piloted in Barnes with 15 residents, and changes were made to the place scale where residents had difficulty with the question due to ambiguity or expressed annoyance that it was too similar to contingent questions. As a result, 4 place indicators were removed from the scale of 12 place indictors.[1] The value statements were also reduced from six to four, as statements about future generations and the economic value of the river were difficult to understand.[2] In the piloted version, residents were asked to rank four potential flood management options, but this question, although understood, was difficult to answer immediately face-to-face and added a significant length of time to the survey administration; it was consequently removed.

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[1] Items excluded were: "I get more satisfaction from living in Barnes than I would living elsewhere."; "I identify strongly with the Thames and the riverside area."; "I feel my local area is a part of me."; and, "I have a special connection to Barnes and the people who live here."

[2] Statements excluded were: "I value the river and the riverside because it adds value to my house.", and "I value the importance of keeping this area the same so that future generations can enjoy the environment I enjoy now."

The main survey was administered face-to-face with individuals living within the flood risk area in Barnes, with a low refusal rate of 8% (identified using Environment Agency flood risk maps (Environment Agency, 2009b)). In Cockermouth the sample was stratified between non-flooded and flooded residents, with flooded residents being individuals who had directly experienced the 2009 flooding at their place of residence at the time (refusal rate was 14%).

In Barnes and in the non-flooded areas in Cockermouth, roads were randomly selected using a roadmap of the area. Sampling started randomly along the selected roads and when a survey had been successfully carried out, three houses were skipped before approaching the next house. In the flooded area in Cockermouth the small number of houses with occupants who had been living there during the 2009 flood meant that every house was approached. Non-flooded houses were again selected using a road map of the area and the sampling procedure used was identical to that carried out in Barnes. A maximum of one interview with an adult per address was undertaken. Each survey took approximately 20 minutes to complete and no incentives for participation were offered. The surveys were carried out in Barnes in July and August of 2011 and in Cockermouth in October and November of 2011. In both locations a field assistant assisted with carrying out the surveys. The socio-demographic details of the residents surveyed can be found at the end of the chapter in table 3.8.

3.7 Analysis of surveys

This section outlines the main analytical procedures used for the survey data to achieve a more in-depth analysis. This section reports on the analysis of the data that contributes to the findings in Chapter 4.

3.7.1 Data input and analysis procedures

All survey data was entered into SPSS and every fifth survey was checked for accurate data entry. Where useful or necessary, data was re-coded to facilitate analysis:

- Question 1 on the length of residence was recoded into five-year blocks: 0-4=1, 5-9=2, 10-14=3, 15-19=4, 20-24=5, 25-29=6, 30-34=7 and 35+ = 8.
- Dichotomous responses of Yes or No, were recoded to 0 and 1.

The qualitative data was coded for questions 2, 4, 8 and 11 of the Barnes survey and questions 2, 3, 4, 8b, 9b, 11, 12b, 14 and 20b for the Cockermouth survey, and then inputted into the main datasheet (See codes in Appendix 6). SPSS was used to determine the frequency of codes for analysis.

In order to gain the strongest and most representative indicator possible of affective and cognitive relationships with place for each area, four variables – two for place identity (e and i) and two for place attachment (a and h) – were averaged in order to create one variable (see table 3.3 for constituent elements). The variable (i) asking about attachment to London was not included in this scale as it is a different place scale, the other variables were focused at the local scale. It was included for potential analysis concerning variations in attachment at the local and city-wide scale. The variable (j) that asks about the attachment to the river was not included in the scale as its meaning proved to be slightly ambiguous for respondents. For Barnes, the Cronbach's alpha score for these four variables was .813; for flooded residents in Cockermouth it was .747, and for non-flooded residents it was .754. In Cockermouth, when all the responses (both flooded and non-flooded) were tested together, the Cronbach's alpha fell to .621, indicating that for these two groups relationship with place is slightly different and not consistent with each other. This means that the measures reflecting the overall sense of place are comprised of four indicators that are internally consistent (following the

method detailed in Gliem and Gliem, 2003). When running statistical tests, the two groups of flooded and non-flooded residents in Cockermouth were therefore analysed separately, based on the more relevant Cronbach's alpha results.

3.7.2 Correlations with place

The Cronbach's alpha score meant that the four attachment and identity variables of the place scale were summed up to one number (Gliem and Gliem, 2003), and this was then tested against six variables elicited in the survey (described in table 3.7) using bivariate non-parametric tests in order to test whether changes in place attachment covaried with the six variables (Hidalgo and Hernandez, 2001; Devine-Wright and Howes, 2010).

	Variables tested for correlation	Reasoning
Place Scale	Length of residence	To test whether the frequently occurring relationship between place and length of residence occurred in the study populations.
	River values	To test whether there is a relationship between cognitive and affective connections with place and valuations of the river.
	Valuation of flood management options	To test whether there is a relationship between affective and cognitive relationships with place and the values that should direct flood management.
	Involvement in the decision-making process	To test whether there is a relationship between affective and cognitive relationships with place and willingness to be involved in proactive adaptation and involvement in reactive adaptation decisions.
	Trust in flood management institutions	To test whether attachment to town relates to trust in civic institutions to manage flood risk in the town.
	Responsibility for flood management	To test whether affective and cognitive attachment to place relates to expected distribution of responsibility.

Table 3.7: Variables with which place attachment was tested for correlation

3.7.3 The role of risk and social capital

To test whether the salience of flood risk affected the strength of the relationship between place and civic behaviour, analyses were restricted to respondents who had answered positively to the question asking whether they believed climate change would increase the likelihood of flooding in their area (Q19 in Cockermouth survey and Q13 in Barnes survey). Using Pearson's R test, place attachment and involvement in the decision-making process were then tested to see whether there was a stronger correlation when there was a belief that the risk of flooding would increase as a result of climate change.

The two social capital variables were averaged to one to be used in tests. Firstly, the correlation between social capital and involvement in the decision-making process was tested to see whether it was stronger than the relationship between place attachment and involvement. Then the analyses were restricted solely to residents with high social capital and tested using Pearson's R test for the following relationships:

- Place attachment and self-perceived voice on the decision-making process
- Trust in the local council and involvement in the decision-making process

Then the analyses were restricted further to residents who had high social capital and trust in the local councils; in this group the strength of the relationship between place attachment and involvement in the decision-making process was tested using Pearson's R test.

3.8 Survey limitations

Some of the limitations of surveys in capturing place meaning have already been acknowledged in section 2.2.2.

Face to face interviewing, whilst ensuring fully answered surveys does to some extent constrain the population sampled. The majority were carried out during the day which means the population sampled was skewed towards stay at home parents and older adults. To try and address this issue, surveys were carried out on Saturdays and early evenings too. Although the literature review and qualitative interviews informed the survey design, the scope of place meanings that could be captured were inherently limited by the survey structure. These limitations were addressed to some extent by the inclusion of open-ended answers in the study, which allowed respondents to expand on their experiences and perceptions. However, there were some questions that could be further clarified if the study were to be repeated as certain issues had not yet emerged during the piloting phase. These are as follows:

- Q5j asking about attachment to local rivers proved to ambiguous and difficult to answer for some respondents and so it was not included in the place scale.

- Q10d in the Cockermouth survey relating to the impact of ecology on rivers. Many respondents answered stating that ecology was important, but not in flood management decisions. The interpretation of the question therefore varied and the answer was framed differently if people expressed this caveat.

- Q13 in the Barnes study and Q17 in Cockermouth study regarding perception of flood risk should have had a 'Don't know' option. This option was suggested by a respondent and entered into SPSS.

- Q14 in the Barnes study and Q19 in the Cockermouth study (same question) ask whether the respondent believes climate change will increase the risk of flooding in the area. Another question should have been included to ask whether the resident believed the risk of flooding would increase due to other causes, as some respondents expressed a belief that development (or lack of it) would increase the risk of flooding in their area.

Despite these limitations the surveys used captured a breadth of information about relationship with place. By including questions of valuations of rivers

alongside variables relating to town level analysis a more nuanced analysis can be undertaken and goes someway to test whether valuations to physical features are distinct from attachment to broader place scales (Lewicka, 2011). By including questions addressing issues of trust, responsibility and behaviour means that place attachment can be considered and analysed alongside elements of the broader socio-political context that Manzo and Perkins (2006) discuss. This additional layer of analysis provides insight into whether place attachment relates to who people feel should manage a place, and how willing personally they are to be involved place related flood-risk management.

3.9 Summary

A mixed methods approach was used for data collection for this study so that both strength of attachment to place and place meaning could be elicited in order to obtain as full a picture as possible of how flooding and flood risk affects and is affected by sense of place. Two study areas, namely Cumbria and Thames were selected to reflect proactive and reactive adaptation initiatives and responses to flooding. The aim was to consider how relationship with place affects adaptive behaviour in response to flood risk without previous experience of flooding in that location, and how it affects adaptive behaviour following the experience of a flood. Within Cumbria, Keswick was chosen for the in-depth interviews because of the demographics of the population, and the closing of the respite home after the flood that made the issue of older adult adaptation particularly salient. Surveys were undertaken in Cockermouth (Cumbria) and Barnes (Thames), exploring place meaning and attachment, informed by the interviews. The qualitative and quantitative methods were tailored to the research questions they aimed to answer, and informed the analysis through an iterative process once fieldwork was completed.

	Categories	Percentage of respondents in Barnes (n=200)	Percentage of respondents in Cockermouth (Flooded) n=79	Percentage of respondents in Cockermouth (Non-flooded) n=101
Gender	Male	47.7	36.7	53.5
	Female	52.3	63.3	46.6
Age	18-24	5	1.3	4
	25-35	6.5	13.9	5.9
	35-44	18.6	19	16.8
	45-54	18.6	19	4
	55-64	16.1	30.4	27.7
	65-74	20.6	7.6	25.7
	75+	14.6	27.8	15.8
Current Status	Working full time	33.2	25.6	22.8
	Working part time	16.6	14.1	11.9
	Unemployed – seeking work	1	1.3	0
	Unemployed – not seeking work	2	0	0
	Retired	33.7	51.3	56.4
	Looking after children/house	8	6.4	5.9
	Disabled	0.5	0	0
	Student	4.5	0	3
	Other	.5	0	0
Highest educational or professional qualification	O-level/GCSE	5	6.3	8.9
	Vocational qualifications	8	13.9	25.7
	A-Levels	16.1	7.6	12.9
	Bachelor degree or equivalent	36.5	26.6	25.7
	Masters/PhD or equivalent	22.1	20.3	11.9
	Other	1.5	1.3	7.9
	No formal qualifications	10.1	24.1	6.9
Number of children living in the house under the age of 16	None	66.3	83.5	78
	1	17.6	5.1	11
	2	11.6	8.9	11
	3	3.5	1.3	0
	4 or more	1	1.3	0
Tenure of residence	Own	74.9	82.3	91.1
	Rent	23.6	17.7	5.9
	Live rent free	1.5	0	3

Table 3.8: Socio-demographic details for survey respondents

Chapter 4: Place attachment and flood management choices

4.1 Introduction

Chapters 2 and 3 provided a rationale for selecting Barnes and Cockermouth as study areas to examine the role of people's relationships with place in determining their expectations around flood management. Both areas are at risk of flooding, and a flood event occurred in Cumbria in 2009. Whilst the level of the Thames often rises and floods the path alongside Barnes, households have not been flooded in recent memory (for over 50 years). However, flood management strategies have being put in place for both areas: in Cockermouth this is in response to recent flood events; and in London this is part of the larger Thames 2100 project, which aims to reduce flood risk over the coming century and beyond.

As stated in the literature review, proactive and reactive framing can affect which aspects of adaptation are focused on and the possible motivations behind this. One of the main impacts of climate change in the UK will be flooding, and flooding has been demonstrated to have a significant impact on people's relationship with place – both in the immediate aftermath and in the longer term (Tapsell and Tunstall, 2008). Adaptation to flood risk is also likely to involve changes to places, either through soft engineering approaches or more permanent hard engineering approaches. As discussed by Brown and Perkins (1992), what people value about a place can change following a significant, destabilising event. In terms of proactive and reactive adaptation, this means that perceptions of place may play a different role either in preferences for adaptation or in deciding what should be protected.

With these different framings in mind, face to face surveys were carried out in the two study areas focussing on how people relate to the area they live in, how

they perceive flood management and how willing they are to be involved in flood management decisions.

This chapter will address the first two research questions:

- Do relationships with place predict expected distribution of responsibility in proactive and reactive flood risk management?

- Do relationships with place predict participation, or planned participation, in adaptation decisions in proactive and reactive flood risk management planning processes?

4.2 Representations of place: Barnes and Cockermouth

In order to capture as full a picture as possible of how residents in both areas perceive their respective towns, the surveys started with a free association task that asked respondents to list three characteristics that describe their local area (as used by Devine-Wright and Howes, 2010). Responses were analysed using thematic analysis, with responses reduced down to 12 representative themes (See appendix 4 for details of survey thematic coding).

In Cockermouth, the responses were split to distinguish between the residents who had been flooded and those that had not. Flooded residents' three most frequently mentioned characteristics were 'friendliness' (21.8%), 'lovely'/'nice' (21.8%) and 'small market town' (9%). For non-flooded residents, the same three characteristics ranked in the top three responses but in a different order: 'lovely'/'nice' accounted for 19% of responses, 'small market town' for 13% and 'friendliness' ranked third at 11%. There were negative attributes mentioned in the free association task such as 'expensive' and 'small town mentality', but these occur much less frequently. Overall, the impression given by the responses is of a town with a friendly community and a distinct market town

identity. One notable difference between flooded and non-flooded residents is how frequently they explicitly mention other members of the community; the characteristic named most frequently by flooded respondents was 'friendliness' (21%), whilst this was only the third most frequent response (11.9%) given by non-flooded residents. Overall, however, both types of resident gave positive descriptions of the local area; the flood does not seem to have negatively impacted how Cockermouth is viewed by those who were directly affected.

In Barnes, the free association task indicates that residents associate the area with positive aesthetic characteristics. The most popular response refers to Barnes having a 'village feel' (21.6%), 'green'/'open spaces' are mentioned by 16.1% of respondents and 14.1 % of people give 'quietness' as a positive attribute. Again, negative characteristics are mentioned infrequently; negative points raised by respondents include complaints about 'a 'lack of diversity'. Residents' descriptions of Barnes do not explicitly mention other members of the community but create an overall positive impression of the area.

Residents were also asked why they had moved to the area. In Barnes, 23.9% of respondents have chosen to live in the area because they feel it is a pleasant location; 14.1% moved there because of family commitments; and 11.7% moved there specifically for the green space. Flooded Cockermouth residents state that their main reason for living in the area is family (25%); 21.4% were local or lived there before; and 16.1% moved there for work. This varied slightly from non- flooded residents, for whilst family reasons are again the main reason given (26.7%), work commitments accounted for 23.3% of the responses and 18.6% of respondents indicate they have moved there because they are local or had lived there before.

Both the descriptions of Barnes and residents' reasons for moving to the area indicate that it is a desirable location aesthetically and is also associated with a good quality of life. The mean length of residency in Barnes for the respondents was 21.55 years. Family connections are the most significant reason for originally moving to Cockmermouth for both flooded and non-flooded residents. The free association task indicates that both sections of the

population have a positive relationship with their local area. The mean length of residency in Cockermouth was very similar for both non-flooded and flooded groups (19.43 years and 19.92 years respectively). Both Barnes and Cockermouth residents demonstrate on average a positive relationship with place as measured by the place attachment scale (this includes aspects of place attachment and place identity). In Barnes, the mean strength of residents' relationship with place is 2.23 (SD=0.79); since 1 represents the strongest possible relationship with place and 5 the weakest, this reflects a weak positive relationship (see Appendix A for examples of both surveys). In Cockermouth the relationship with place is comparatively stronger; for non-flooded residents it is 2.15 (SD=0.69) and for flooded residents it is 2.05 (SD=0 .72).

4.2.2 Affect of a flood event on perceptions of Cockermouth

In order to gauge how the flood in 2009 affected residents' feelings about Cockermouth, an open answer question was included in the survey asking how respondents felt about Cockermouth following the flood. The responses were coded using thematic analysis. The results from the flooded section of the population and non-flooded groups have been analysed separately, and the results offer an insight into how perceptions of a town can differ between those who experience a flood in their house directly and those who do not (Details of codes can be found in Appendix 4).

For flooded residents, the most frequently cited responses are that people in the local area have been brought closer together by the flood (31.9%); that the flood has brought unwanted changes to the market place and town (12.8%); that the town has not yet recovered (12.8%). The most frequently cited response refers to the positive social elements of Cockermouth. However, the other two most popular responses refer to negative changes to the area: unwanted changes to the town marketplace that occurred following the flood and the fact the town wasn't the same.

For residents that had not been flooded, by far the biggest change noted in the town was that there are new shops and cafés (in these instances a positive

change 31.7%), and that people had been brought closer together (24.4%). The third most frequently answer was that the town was back to what it was (12.2%). Flooded residents reference a positive social aspect of Cockermouth (people have been brought closer together) most frequently, but go on to refer to unwanted change and slow progress in the town following the flood. The non-flooded residents were more likely than flooded residents to mention positive physical changes to the town such as the new shops and cafés (the third response was neutral).

It is, to a certain extent, unsurprising that the negative impacts of the flood were particularly salient for the flooded residents (as compared to the three positives raised by non-flooded residents) since their living arrangements and daily routines shifted significantly as a result of the flood. The social facets of living in Cockermouth seem to have had a significant impact on how both groups were affected by the flood, though they seem to have been more significant for flooded than non-flooded residents. This corresponds with the findings from the free association task laid out in section 4.1, which show that flooded respondents are more likely to refer to the social aspects of Cockermouth (e.g. friendliness) than non-flooded residents. Later on, section 5.2 will describe the important role of social networks following a flood. This ties into the literature on place attachment that suggests people become more conscious of the social aspects of a place following a flood event (Chamlee-Wright and Storr, 2009). Whilst these results are from short open-ended answers, the responses offer an insight into how Cockermouth is discussed by residents and reflects place related meaning. This process of how social connections become more salient after a flood is explored in more detail in chapter 5 (Section 5.2); however, it is an important finding to highlight here. Whilst only touched on in the surveys, these changes in how residents experience a place do not only affect their well-being in the present: they shape their interactions and possibly place-related behaviour in the future.

In order to gain a better understanding of how being directly affected by a flood can affect people's experience of place, flooded residents were asked if their feelings about their house had changed since the flood. The resulting open-ended answers were coded into nine categories. The most common responses

are positive (27.3%) and indicate that the flood had made their house seem more precious. This type of response often alluded to the way the recovery process had made the respondent's attachment to their house more salient. For example:

> 'in a positive way, because of the work we have done it's more part of us. More solid. We feel more grounded.' (Survey 55)

> 'I feel more attached because it's still standing. Week before we had done up the house. It's about investing. Very emotionally attached. Spiritual beliefs . . . living in nature is just who I am. Want to be home. Love the river.' (Survey 58)

One of the reasons that the most common response may have been positive was that negative impacts were spread out over 7 of 9 codes. They were distinct enough from each other to require different codes but do skew the results if only the top 3 are noted. The second most frequent response was that 22.7% of respondents felt their house didn't feel the same, or like home anymore, following the flood:

> 'It's just a house now. It was a home before.' (Survey 90)

> '[It's] still a beautiful house. We did whole house up, still not the same. We lost family heirlooms.' (Survey 160)

The next most common response is that residents do not feel safe in their house (13.6%). It can be expected that a flood would have a negative impact on feelings of security (Harries, 2008); in the event of a flood, previously stable parts of daily life become insecure and, in some instances, this results in a permanent shift in residents' feelings towards their houses. However, for a quarter of respondents the flood led to material improvements in their home and this gave them a new appreciation for their homes. The variation in these responses demonstrates that floods do not have a uniformly negative impact on how people feel about their living spaces. In fact, by making a quarter of

residents more aware of their attachment to their home the flood caused them to value it more. However, floods also challenge previously held assumptions about the security of a house and when these assumptions are challenged there can be a shift towards feelings of insecurity.

4.2.3 Measuring relationships with place and how it relates to length of residency

In order to capture affective and cognitive relationship with place, four variables – two for place identity ('e' and 'i') and two for place attachment ('a' and 'h') – were used to form a place attachment scale (See Figure 3.6). For Barnes, the Cronbach's alpha score for these four variables was 0.813; for flooded residents in Cockermouth, it was 0.747 and for non-flooded residents it was 0.754. In Cockermouth, when all the responses (both flooded and non-flooded) were tested together, the Cronbach's alpha score fell to 0.621, which indicates that the relationship with place is inconsistent between the two groups. This means that the measures reflecting the overall place attachment are composed of four indicators that are internally consistent (following the method detailed in Gliem and Gliem, 2003). When running statistical tests, these two groups (flooded and non-flooded residents in Cockermouth) were therefore analysed separately (based on the more relevant Cronbach's alpha results). For the rest of this chapter variable that reflects this scale will be referred to as place attachment for simplicity, reflecting practice in other studies (Kyle et al., 2005, Lewicka, 2005).

As with other studies (Harlan et al., 2005; Kleit and Manzo, 2006), length of residency correlates with relationship with place for both flooded and non-flooded residents ($p<0.01$ $r=0.423$ for flooded and $p<0.05$ $r=0.228$ for non-flooded) in Cockermouth. The longer a resident has lived in Cockermouth, the more likely they are to have a positive relationship with place. The strength of this correlation is significantly stronger for flooded residents than it is for non-flooded residents. This difference in attachment may suggest that the increased significance of social networks for flooded residents following a flood (section

4.1.2) may increase the strength as well as focus of place attachment. In Barnes, the relationship between length of residency and place attachment was similarly strong ($p < 0.01$ r=0.322). In both locations, people have built up emotional connections to the place they live in over time.

4.2.4 Rivers and their associated values

As described in section 2.3, there have been suggestions that more attention should be paid to physical aspects of place and that a quantitative measure of place attachment should not be assumed to reflect a homogenous level of attachment to all aspects of place. To gain a more nuanced understanding of how residents in both locations relate to certain aspects of their local area, respondents were asked how they value the rivers in their areas: the Thames in Barnes, and the rivers Cocker and Derwent in Cockermouth. Since the focus of this study is on fluvial flood risk and possible adaptation measures, this finer level analysis was used in an attempt to discern whether there is a significant difference between how people relate to their local areas in general and how they related to their local rivers specifically. As flood management is likely to take place on or adjacent to rivers, these insights could potentially explain people's preferences in relation to flood management if rivers and the riverside hold particular meanings. A four-part question was included in the survey to ascertain how the rivers in each location were valued. The four sub sections encompassed the aesthetics of the rivers, the spiritual aspects of the rivers that contributed to well-being, the utility of the rivers and the importance of the history of the river to the resident (adapted from Brown and Raymond, 2007). The responses in Cockermouth to these questions are shown in Table 4.1 below:

Value statement	Flooded (% agreed and strongly agreed)	Non-flooded (% agreed and strongly agreed)
I value the riverside for the attractive scenery, sights and sounds (aesthetics)	86.6	96.1
I value the river and the riverside because of the recreational opportunities it offers (utility)	65.9	76.7
I value the river and riverside because of the history it holds and the heritage it has (history)	69.5	68
I value this river because it helps me feel better physically and mentally (spiritual)	69.5	73.8

Table 4.1: Valuation of rivers in Cockermouth by flooded and non-flooded populations

Overall, non-flooded residents were more likely to positively value the rivers; however, both sets of respondents in Cockermouth demonstrated generally positive valuations of the rivers in their area. In terms of aesthetics and recreational opportunities, 10% more of non-flooded respondents said they valued the rivers for these qualities than flooded respondents. The lower levels of valuation amongst the flooded population may reflect a more ambiguous relationship with the river following their direct experience of flooding. Although interestingly, 69.5% of flooded respondents agreed that the river made them feel better, the experience of being directly impacted by the floods has not seriously undermined their relationship with the river.

In Barnes, there were also high levels of positive valuation of the river Thames, with 93% of respondents agreeing that they valued the riverside for the attractive scenery, sights and sounds (see Table 4.2). The history and heritage of the Thames was the least highly ranked value. Overall, residents from both towns exhibited positive attachment to their local areas as a whole and also valued the rivers that run through them.

Value Statement	% of respondents who agreed or strongly agreed
I value the riverside for the attractive scenery, sights and sounds (aesthetics)	93
I value the river and the riverside because of the recreational opportunities it offers (utility)	71.2
I value the river and riverside because of the history it holds and the heritage it has (history)	59.6
I value this river because it helps me feel better physically and mentally (spiritual)	81.4

Table 4.2: Valuation of the Thames by Barnes residents

As O'Brien (2009) discusses, values shape what adaptation options are desirable and therefore what adaptation options should be prioritised. The four value statements presented in the table above outline the importance of different river associated values for the respondents. What is evident in both locations is that the rivers are valued highly overall, with historical valuation being the least significant factor in both locations. In both locations, therefore, the positive relationships with place discussed in section 4.1 are accompanied by positive valuations of the rivers that run through them. In this instance, the specific physical feature of the river reflects wider place attachment to the town. These valuations of the river are then quantitatively tested against river management options in section 4.3 to see if they explain certain preferences for river management options.

4.3 Priorities for flood management

In the UK, flood management strategies vary significantly from soft engineering approaches though to hard engineering approaches and permanent structures.

The priorities placed on the type of strategy put in place depend both on the demands of the public and the institutional constraints adhered to by the decision-making bodies. In both locations, there were several proposals put forward as methods for addressing flood risk. Recognising that different flood management techniques involve different processes and impact on place differently, residents were asked how important seven different aspects of flood management were on a scale of 1-5 (with 1 being very important and 5 being unimportant). These seven aspects were: cost, impact on how the area looks, impact on access to the river, impact on ecology, impact on local house prices, ensuring equal levels of defence and impact on insurance premiums.

In Cockermouth, how flooded and non-flooded residents rated the flood risk priorities items varied. In terms of how important aesthetics, cost, access and ecology are in designing flood management, larger numbers of non-flooded residents than flooded residents consistently agreed that these were important considerations. House prices and the equal defence of all residents were the two aspects of flood management that both groups agreed were important. Insurance premiums were a more prominent concern amongst the flooded residents. Being flooded at a household level reduces the importance of aesthetics, cost, access and ecology, and this is reflected in the slight variations in how the river was valued between the two groups.

Place attachment was tested against the different facets of flood management as a possible determining factor in flood management preferences – if people are more attached to their local area it may inform how they would like flood management plans to be designed. For flooded respondents, the importance of access to the river ($p<0.05$ r=0.226) and the ecology of the river ($p<0.05$

r=0.230) correlated positively with their relationship with place. For non-flooded residents in Cockermouth, place attachment did not relate significantly to any of the different facets of flood management design.

So place attachment does correlate with flood management preferences for flooded residents – to a certain extent. When considering how river valuations (bringing the focus to valuation of physical aspects of place) may affect preferred flood management choices, for flooded residents the four facets of river valuation, aesthetics ($p<0.01$ $r=0.472$), utility ($p<0.01$ $r=0.531$), history ($p<0.01$ $r=0.406$) and spiritual ($p<0.05$ $r= 0.276$) all correlate with just one aspect of flood management – access to the river. Once again, access to the river relates to feelings about place management. The more strongly the river is valued across all four dimensions, the more important it is for flooded residents that access to the river is maintained as part of any flood management scheme. For non-flooded residents, this correlation did not exist in the same way; there was a weak correlation between the aesthetic and utility valuation and access to the river. Positive feelings for place and specifically for rivers is likely to relate to support for flood management to be conducive to river access for residents, however other aspects of design such as aesthetics and equal protection are not predicted by relationships with, or valuations, of place. Additionally, specific valuations of rivers do not seem to vary significantly from a generalised attachment to the town (Cockermouth) in terms of how flood management should be implemented. Whether relationship with place is focused at the river scale or at the town scale, in this instance it plays a similar role in deciding how a river should be managed.

In Barnes, there was a weak positive correlation between residents' place attachment and the four facets of flood management strategies: aesthetics ($p<0.05$ $r=0.238$), access to the river ($p<0.05$ $r=0.222$), local house prices ($p<0.05$ $r=0.207$) and potential to reduce insurance premiums ($p<0.05$ $r=.253$). There was a slightly less strong but nonetheless still significant relationship with belief that all residents were defended equally from flooding ($p<0.05$ $r=0.148$). Only views on the ecology of the river were not significantly

influenced by residents' place attachment. In this study area, when considering flood risk proactively, place attachment correlates with almost all the aspects of flood management design. It would appear that relationship with place impacts on the types of proactive flood management strategies people in a flood risk areas consider important. However, in Cockermouth, where the planning project follows an experience of a flood, relationships with place do not play such a significant role.

4.4 Distribution of responsibility for flood risk management.

The first research question focuses on the role between people's place attachment and their expected distribution of responsibility for both reactive and proactive flood management strategies. Do people's relationships with place correlate with their expectations around the distribution of responsibility? In England, flood management involves a number of bodies, some with statutory responsibilities and the householder can also play a role in preventative flood management by being involved in decision making processes and/or by making changes to their property.

Firstly, respondents were asked about their levels of trust in the different bodies involved in flood management. The results of which are shown in table 4.4, trust in the different bodies were lower across all the actors for flooded residents. These findings were then tested against place attachment to see if place attachment relates to trust in the bodies that are most closely related to its management (namely Allerdale and Cumbria Council) In Cockermouth, both for the flooded and non-flooded residents, place attachment does not correlate with trust in the local bodies to manage flood risk, or with expectations for them to do so. This suggests that people's perceptions of a place are not necessarily connected to how they perceive the governing bodies that manage the place in question. Respondents' levels of trust in different bodies to manage flood risk are listed below (Table 4.3):

Actor	Flooded (agree and strongly agree)	Non-flooded (agree and strongly agree)
Cumbria Council	32.1%	38.6%
National Government	11.5%	27.7%
Environment Agency	33.3%	54.5%
Allerdale Council	28.2%	47.5%

Table 4.3: Cockermouth residents' levels of trust in actors to efficiently manage flood risk in the next 25 years.

The next question addressed where responsibility should lie for management of flood risk in Cockermouth. Residents were asked to what extent they agreed that action to reduce the likelihood of household flooding over the next 25 years was the responsibility of five groups: homeowners, the local council, the county council, national government and the Environment Agency. The results for Cockermouth are given below in Table 4.4:

Actor	Flooded (agree and strongly agree)	Non-flooded (agree and strongly agree)
Homeowners	52.6%	66.3%
Allerdale Council	75.3%	88.2%
National Government	84.2%	88.2%
Environment Agency	85.7%	96.1%
Cumbria Council	77.9%	96.1%

Table 4.4: The actors that Cockermouth residents' feel should take responsibility for flood management in the next 25 years

Flooded residents were less likely to attribute responsibility to homeowners; however, over 50% of flooded respondents still agreed that they should have some responsibility. Between the two groups, non-flooded residents were more likely to attribute responsibility to a number of different bodies. The difference in expectations of Allerdale Council between flooded and non-flooded residents could be seen as a result of flooded residents' awareness of the financial limitations (this was often referred to by respondents during the surveys).

Residents' place attachment was tested as a possible explanatory factor for why householders may or may not take responsibility for protective action against flooding; however, place attachment did not correlate with any aspect of

distribution of responsibility for any   of the residents of Cockermouth. This finding suggests that affective and cognitive attachment to the local area does not mean attached individuals are more willing to undertake action themselves to protect their homes.

Actor	Strongly agree and agree
Richmond Council	45.2%
National Government	35%
Environment Agency	64.3%
The Mayor of London's office	34.4%

Table 4.6: Barnes residents' levels of trust in actors to efficiently manage flood risk in the next 25 years

In Barnes, the relative trust in different actors were fairly similar to the responses given by the non-flooded residents in Cockermouth. In Barnes, residents' place attachment does correlate with their trust in Richmond Council's ability to manage flood risk in the local area effectively (details in table 4.6). This correlation does not hold for the national bodies. This finding is slightly different to the relationship between place attachment and trust in local bodies found in Cockermouth. In Barnes, place attachment may incorporate some level of connection with the local government and a trust in their ability to help manage local flood risk.

In Barnes, residents were asked the same question regarding distribution of responsibility and their responses are listed below (Table 4.7):

Actor	% of respondents that agreed and strongly agreed
Homeowners	39.2%
Richmond Council	89.9%
National Government	87.9%
Environment Agency	90.4%

Table 4.7: The actors that Barnes residents' feel should take responsibility for flood management in the next 25 years

In Barnes, residents were far less likely than those in Cockermouth to attribute responsibility to homeowners. When place attachment was tested against distribution of responsibility, it was not found to be significant. So, although residents' relationship with place in Barnes is suggestive of how they feel flood management strategies, and hence place change, should be designed it did not relate to how they felt responsibility for implementation should be distributed.

In Cockermouth, a strong place attachment amongst residents does not correlate with a belief that householders or the local government should be responsible for flood management. There may be mediating variables not included in the survey that can explain this disconnect, but strong emotional attachment or connectedness to place do not seem to correlate with a sense of responsibility or ownership when it comes to household level adaptation to flood risk.

4.5 Flood management behaviour

The second research question that this chapter addresses is whether place attachment is predictive or correlates with involvement (or intended involvement) in community-level flood management decisions. As demonstrated in section 4.3, relationship with place did, to some extent, predict how people prioritise different aspects of flood management in Barnes; however, it did not indicate who they thought should be responsible for it. Looking specifically at the mechanics involved in producing flood management strategies, does relationship with place predict or correlate with the actions that people are willing to undertake or have already undertaken with relation to flood management in their town?

For respondents in Barnes, place attachment correlates with a willingness to undertake specific actions relating to flood management in their local area for the next 25 years. This included: attending meetings with the Environment Agency ($p<0.05$ $r=0.258$); joining a flood action group ($p<0.05$ $r=0.120$); contacting a local councillor ($p=0.05$ $r=2.16$); and attending meetings held by the council ($p<0.01$ $r=0.217$). There is a slightly weaker correlation with

signing a petition (p<0.05 r=0.158). This relationship between a positive relationship with place and involvement in protective action against floods indicates that the more attached to a community or area an individual is, the more likely they are to be involved in action around flood risk management.

However, this relationship was not evident in Cockermouth; for non-flooded residents, the only correlation between relationship with place and involvement in flood management processes was with the specific action of signing a petition (p<0.05). For flooded residents, relationship with place did not correlate with any of the actions listed as part of the flood management process. In Cockermouth there is not a direct relationship between place attachment and involvement in flood management decisions, therefore place attachment and place related meanings are unlikely to result in involvement in decisions about how Cockermouth should be managed.

4.5.1 Belief in risk as a controlling factor

In the risk literature, it is noted that mitigative behaviour can be triggered when the issues in question reach a certain level of salience for the individual (Grothman and Reusswig, 2006). So, when considering residents' involvement in the flood management process it is important to ask whether they believe the risk in question - in this case, the risk that flooding may increase in the future - is genuine. In light of this, residents were asked if they believed that climate change will result in an increased risk of flooding in their area in the future.

In Barnes, 20.6% of respondents felt that they were currently at risk of flooding even with existing defences, and 73.9% of those surveyed agreed that climate change will increase the risk of flooding in their area. In Cockermouth, 48.9% of respondents felt that climate change will increase the risk of flooding in their area.

Of the people in Barnes who believe that the risk of flooding is going to increase with climate change, place attachment correlated at the 99 per cent confidence level with four facets of willingness to be involved in the flood management

process: attending a meeting held by the Environment Agency (r=0.304); joining a flood action group (r=0.255); contacting a councillor (r=0.256); and attending a meeting held by the council (r=0.244). The only action it does not correlate with is signing a petition. For residents in Barnes, belief that the risk of flooding will increase in the future strengthened the relationship between their place attachment and their willingness to be involved in all aspects of flood management decisions (other than signing a petition).

In Cockermouth, the findings were more nuanced. Of the non-flooded residents who believed that climate change will bring an increased risk of flooding, place attachment correlated positively with the behaviours of joining an action group (p<0.05 r=0.317) and contacting a councillor (p<0.05 r=0.317). The relationship with place amongst flooded residents who expressed the belief that climate change will bring an increased risk of flooding did not correlate with their involvement in the decision making process. For non-flooded residents, the belief that climate change will increase the risk of flooding acts as a motivating factor in relation to two of the actions involved in the flood management process (when residents do not believe the risk will increase, place attachment does not correlate with involvement in the flood management process). This demonstrates that in some instances place attachment will only lead to behaviour if threats to place are salient (in this instance, perception of flood risk) before it affects behaviour. However, a belief in increased flood risk does not appear to affect flooded residents' desire to be involved in the flood management process. It may be that direct experience of a flood removes the importance of perception of risk as a trigger. Cockermouth residents who haven't been flooded and consider flood risk to be a real threat are more likely to have engaged with the decision making process; however, once a resident's house has experienced flooding this relationship between place attachment and participatory behaviour does not hold. Something about the flood event appears to have removed the connection between residents' affective relationship with place and their willingness to take part in town level place protective behaviour.

4.5.2 The role of time in residence, social capital and trust in involvement in flood management planning decisions

It has been suggested that place attachment can only play a role in behaviour when other enabling conditions are met (Mihaylov and Perkins, 2013). To try and understand whether the disconnect between place attachment and behaviour in Cockermouth flooded residents could be affected by other variables two factors are considered further: the role of social capital and the role of trust in institutions. These have been demonstrated before to affect the predictive power of place attachment and attitudes to place change (Devine-Wright and Howe, 2010; Dallago et al., 2009)

Firstly, to gain a wider picture of how floods may have impacted residents' social capital, the relationships between length of residence and social capital was tested. For non-flooded residents, length of residency correlates with social capital. The longer a non-flooded resident has lived in Cockermouth, the more likely they are to have higher levels of social capital. Social capital indicators in turn correlate with involvement in the flood management process; in particular, social capital correlated with signing a petition ($p<0.01$), joining a flood action group ($p<0.05$) and contacting a councillor ($p<0.01$). However, length of residency does not predict social capital for flooded residents and in turn the social capital of flooded residents does not correlate with their willingness to get involved in any aspect of the flood management decision making process. Experiencing a flood event at the household level appears to have undermined processes that connect length of residency with social capital for residents; likewise, it weakens the link between social capital and involvement in decision-making processes.

As Devine-Wright and Howes (2010) discuss in their paper about wind energy developments, trust in key actors can be a mediating factor when it comes to place attachment and attitudes. As high social capital did not predict flood management behaviour the sample was confined to only flooded residents who had high social capital and this group was tested to see if trust in the local

council correlated with flood management behaviour. If flooded residents' social capital is high, trust in the local council correlates with three aspects of the flood management process – signing a petition ($p<0.05$), joining a flood group ($p<0.05$ $r=0.278$) and attending a meeting ($p<0.05$ $r=0.254$). However, non-flooded residents' trust in Allerdale Council does not make a difference to their willingness to get involved in the flood management process. For flooded residents, social capital and trust in the local council are mediating factors that determine their willingness to get involved in the decision making process; however, these factors are not significant for non-flooded residents. The direct experience of a flood acted as a significant stressor for these residents and only when feelings of social capital are positive and trust in the council is present will it result in taking part in town level decisions.

It is not surprising that first hand experience of flooding leads to an increased awareness of the role of governing bodies. Household level flooding brought flooded residents into direct contact with a range of actors, including local government. With these enabling conditions in place correlation between place attachment and involvement in the decision making process was tested for flooded residents with high social capital and high trust in Allerdale Council, a correlation was found ($p<0.05$ $r= 0.469$) for attending a meeting. While this was only demonstrated in a very small sample, it does suggest that, for place attachment to play a role when an individual has been directly impacted by a flood, other mediating factors are significant. It also demonstrates that social capital and trust in institutions are more important determinants than place attachment when it comes to involvement in town level adaptive action. This corroborates Mihaylov and Perkins (2013) assertion that place attachment may only manifest in behaviour when other enabling conditions are present.

4.6 Summary

This chapter has addressed a range of issues related to flood management in Barnes and Cockermouth through the lens of the first two research questions. In terms of distribution of responsibility, place attachment does not seem to affect how residents in Cockermouth attribute responsibility. A strong affective

relationship with place did not correspond with a willingness to take responsibility at the household level for flood management, and did not influence residents' expectations around the role local bodies should play in flood risk management. For Barnes residents, relationship with place did not determine expected distribution of responsibility with respect to flood management. However, place attachment did correlate with residents' trust in Richmond Council to manage flood risk in the coming 25 years (Richmond Council being the governing body most closely related to Barnes, with the others operating at the city or national level). For Barnes residents, a strong relationship with place correlates with trust in the local body to manage flood risk; *however,* it did not correlate with an expectation that the council should take action.

The second research question centres on respondents' involvement in the decision making process, and generated several interesting findings. Firstly, in Barnes (where the decision making process is anticipatory) relationship with place correlates with a range of behaviours. In Cockermouth, relationship with place only correlates with one behaviour (signing a petition) for non-flooded residents; for both flooded and non-flooded residents, place attachment does not predict involvement in any of the decision-making behaviours. In Cockermouth, place attachment alone does not predict involvement in flood management decisions.

However, once increased flood risk in the future becomes salient for non-flooded residents, their place attachment correlates with two aspects of involvement in the flood management process. For flooded residents, social capital and trust in the local council act as mediating factors between place attachment and involvement in decisions on flood management at the community level. Considering relationships with place as a driver of behaviour (both prospective and reactive), it appears to be a good predictor in the prospective planning process. However, once a flood has been experienced this affective relationship, whilst still holding, does not determine flood management behaviour in the same way. If trust in a local body has been undermined or social capital reduced, place attachment will not predict

residents' active involvement in flood management decisions. Its strength as a driver of behaviour is reduced.

Chapter 5: Relationship with place and older adults' experience of a flood event

Chapter 4 addressed the quantitative aspects of relationship with place, and how the experience of flooding interacts with different aspects of place as well as relating to adaptive behaviour. Whilst the data highlights where correlations exist, it is not able to reveal the more detailed processes of how a flood event can affect people's experience of place, or what aspects of place mediate how people experience a flood and the subsequent recovery period. The third research question centres on these latter issues, and this chapter will explore them in detail. In particular, there is a focus on how a flood event can make people more aware of aspects of their living spaces and town and how this can affect how they relate to these places. Evidence from the literature review suggests that sudden, shocking events can make aspects of a place more salient. As Chamlee-Wright and Storr, writing about experiences of the New Orleans flood of 2005, suggest: 'The meanings that individuals attach to their neighbourhoods sometimes only become articulated when those sites are lost' (2009:20).

In order to gain a deeper understanding of how flood risk and its relationship with place can shape adaptive behaviour, this study focuses on Keswick, one of the towns that was flooded in Cumbria in November 2009. The breakdown of vulnerable groups in Cumbria indicates that a disproportionate number of older adults were affected by the flooding – approximately 63% of the residents who experienced flooding were from older social groups. This is particularly notable when we consider that older social groups only make up 17% of the general population (Cumbria Intelligence Observatory, 2010). Older adults were identified as being particularly vulnerable to flooding in the literature review (Sharkey, 2007), and the statistics provided by Cumbria Council illustrate that this group were particularly affected by the 2009 flood.

As the gerontological literature demonstrates, as people get older, their physical limitations mean that household and neighbourhood life become increasingly important to the formation of feelings of self-sufficiency (Gitlin, 2003; Day, 2008). The significance of place for older adults suggests that they are particularly vulnerable to disruptive events such as flooding, and will experience it in a way particular to their age group. The nuances of flooding experiences are difficult to capture through surveys, so in-depth interviews were used to consider how a flood event can affect this demographics' relationship with place, given that they are already particularly sensitive to their surroundings.

Alongside this particular demographic related vulnerability is the general trend for ageing populations in developed countries, which means that in absolute terms this is a vulnerable population that will continue to grow (Harper, 2006; Quinn and Adger, 2011). This cohort was selected for in-depth study due to the vulnerability of this cohort to the 2009 floods (as revealed by the data on flood-affected populations in Cumbria) and the relative lack of research into how older adults adapt to climate related change (Berrang-Ford et al., 2011). In-depth interviews provided a nuanced understanding of how perceptions of place and a sudden event (such as a flood) interact and what this suggests about older people's adaptive capacity.

This chapter employs inductive thematic analysis of the 14 participants' accounts of their experience of flooding and flood response (the socio-demographic characteristics of the participants are described in section 3.4). Seven of the respondents had had their houses flooded; the other seven had not, but lived within the town boundaries. The transcripts were coded, and themes that emerged across the transcripts were merged to determine the superordinate themes.

The superordinate themes that emerged from the data were: place dependence and place attachment; the importance of networks; the physicality of floods as an older adult; and the inoculating effect of the life experiences framing the flood (see Table 5.1).

Superordinate Themes	Subordinate themes
Place attachment and place dependence	Reason for moving to Keswick Functional health
Importance of social capital and networks	Family networks during and after the flood Decision-making and security Community networks and information
Physical limitations when dealing with the floods and flood risk	Anticipation of physical obstacles Agency over decisions Rootedness due to age
The inoculation effect	Acceptance of flood risk 'Bigger picture' framing Local knowledge and feeling in control

Table 5.1: Themes that emerged from in-depth interviews

5.1 Place attachment and place dependence

Participants were asked why they had decided to live in Keswick. For those who were not local, the aesthetics of the Lake District (and the surrounding area) was a common reason given. Their move to Keswick is often framed against the backdrop of another location that had not been as enjoyable to live in, singling out Keswick as particular and special. This deliberate choice of Keswick as a place to move to correlated with a strong place attachment, Quotes 1 to 4 are representative of the way interviewees characterised Keswick (see Table 5.2 below). The relationship of two participants (G and N) to the area had been established years prior to their move to Keswick, indicating that they had a high level of investment in the move and that their relationship with Keswick preceded their physical relocation.

While most of the participants demonstrated a positive attachment to the area, it is often more focused on the wider area of the Lakes and not the town itself (quote 4). Six of the interviewees found the town overly tourist-oriented, and whilst most respondents spoke positively about living in Keswick, the amenities in town were not mentioned as a reason for living there. Therefore, in terms of place dependence, it was not the facilities of the local area that attracted interviewees to move there.

However, on a smaller scale, functionality, rather than aesthetics, is often what attracted older residents to particular houses and particular streets. The physical geography of particular parts of town often led respondents to choose certain houses. Three of the participants highlighted the importance of living in close proximity to shops and having a flat route into town from their homes (such a route would not be available to residents living further up the town, away from the river). Participant J's response was particularly explicit about the importance of the physicality of place as an older adult (quote 5).

Functional health in older adults has been connected to their neighbourhood environment (Wen et al., 2006). This helps explains why High Hill and Crosswaite Road, both areas near the centre of Keswick on flat land, appeal to older adults. The physical demands of being an active and independent older adult introduce vulnerabilities; the physical geography that makes certain neighbourhoods attractive to older adults in Keswick also introduces risk. In hilly areas like the Lake District, flat areas are often limited to places with rivers and lakeshores.

The heightened awareness held by older adults of the geography of the town revealed an issue that ran though many of the interviews: the identification of certain areas in the town as vulnerable places. The tidemark of the flood is renewed in the dialogue around who was affected and who was not. Place meaning is determined at the collective as well as the individual level (Di Masso et al., 2013), references to being 'higher up' (participant I) from non-flooded residents serve to actively demarcate the places in town that were flooded from those that that were not. Through this process, a certain stigma is attached to the flooded areas where residents are perceived to be tied to their houses (Scannel and Gifford, 2010; Walker et al., 2011). For example, participant L (a non-flooded interviewee) describes in quote 7 the difficulty flooded residents will face when trying to sell their houses. This perception of flooded residents being stuck or tied to houses is further explored in section 5.3, and was an issue discussed by both flooded and non-flooded participants. There is a significant distinction, especially from the non-flooded residents' point of view, between those areas that were directly affected by the flood and those that were not.

The aesthetics of the area featured prominently in the interviews; attachment to views and available walks was frequently indicated. However, the practical requirements of everyday life that make living in a flat area of town attractive—the place-dependent aspect of the interviewees' relationship with Keswick—make older people particularly vulnerable to flooding. When considering how a person's relationship with place is often broken down into place dependence, place attachment and place identity (see section 2.2.1) it becomes clear from the interviews that the participants' overall sense of place extends beyond the town's boundaries into the wider countryside. Place identity in terms of an explicit connection with the town is somewhat weaker, with over half of the interviewees raising the changing nature of the town and the targeting of amenities towards tourists as negatives. Turning to the place-dependent aspect of living in Keswick, it is clear that the interviewees felt there were very few other places that would provide the aesthetics that Keswick offers. As the attachment to Keswick was often part of an attachment to the wider area (The Lake District), the flood does not appear to have significantly changed how participants view Keswick itself. However, as will be explored in subsequent sections, at the household scale there is ambivalence about the impact of the floods. Additionally, there are several processes that contribute to everyday life in Keswick that mediate the vulnerability of this group of older adults.

Quote no.	Quote	Participant
Q1	'Well that's right, [people are] *far friendlier than down south, I came from down south where no one looks you in the eye but everyone here talks to you here.'*	A
Q2	*'And then I went back to Liverpool for five years, but for me it was the whole thing I liked, you look and you're like that's glaciation.'*	G
Q3	*'Well originally we had family here and we used to come and visit them and we camped in Borrowdale, and it was so different, we were from the industrial north east so we wanted to get to somewhere more rural.'*	N
Q4	*'It's gone off with a capital G, all these tatty shops selling outdoor gear. I think a lot of Keswickians go out of town to shop now, but apart from that it's the most beautiful place to live.'*	H
Q5	*'Yeah, there are much better areas than this perhaps. But this is a very good situation, as one gets older. You're on the level; the shops are not very far away. It's a good situation.'*	J
Q6	*'Didn't affect us at all, because we are sixteen steps higher up. [It's a] bit of a pull up for us but at least we know we won't be flooded.'*	I
Q7	*'I hope for our friends sake that they don't get flooded again. They were planning to downsize and move and sell and they can't sell their place now."*	L

Table 5.2: Illustrative quotes for place attachment and place dependence

5.2 Importance of networks

Emerging clearly from across the interviews was the significance of family networks in how people adapt to flood risk: family members can help people evacuate; house people after a flood; and deal with the issues that arise when re-establishing life after a flood. Four participants out of the seven that were flooded stayed with family members immediately after the flood. For one participant, this stay was lengthy, lasting seventeen weeks. Place and place attachment are, in part, formed by social relationships (Manzo, 2003; Mihaylov and Perkins, 2013), and this research indicates that the social elements of living in Keswick have impacted on participants' resilience to floods. In their 2000 study, Tyler and Hoyt demonstrate that having social support and being able to link up with support networks following a flood reduces the likelihood of depression in older adults following a flood event. Participant H's interview (quote 8) highlights the importance of family members and bonding social capital, and illustrates how these factors influence people's decisions regarding whether or not to leave their house at the time of a flood. In fact, family members made the decision to leave the house on behalf of four of the interviewees. To some extent, this removes stress from the decision-making process and also appears to contribute towards a sense of ontological security for older adults at risk of flooding (see Harries, 2008). However one interviewee highlighted the fact that vulnerability can emerge if this perceived support is not manifested in reality. The interviewee discussed the case of a local resident who had discussed having family living nearby, so other locals assumed that help was being provided. However this proved not to be the case and the resident was not offered help and had to cope with the flood by herself; in contrast, another neighbour without family members received prompt help from local residents. This case highlights the significance of perceived support networks and the increased vulnerability of residents if the extent of the social support available to them is misunderstood (quote 9). In most cases, perceived support networks perform as expected. The narratives that families construct around flood risk and behaviour actively shape how flood risk is reacted to and

interpreted in particular cases. However, the case of the resident discussed in quote 9 demonstrates that vulnerabilities are exacerbated when these perceived networks do not perform as expected, especially in anticipation of and during a flood.

Close relationships with family members and their valued influence were also highlighted in discussions about the plans for a new floodwall in the town. Participants often nested their responses to flood risk and flood management proposals in the opinion of family members, for example, when participant F was asked how she felt about the plans she referred to her son who had looked up the plans for her on the Internet and offered his advice. Most participants displayed a psychological resilience in the face of the flood and the subsequent recovery period. This resilience seems to be partially underpinned by strong connections to family networks and the wider community, reinforcing the importance of the social elements of place and community attachments that were discussed in Chapter 4 (See section 4.2). Families offer a buffer through which decisions can be made, and community connections allow residents to stay well informed and well placed to use local networks both during and after a flood. For example, participant D helped speed up the process of reconnecting flooded houses to the electricity grid by contacting a local electrician to carry out safety tests rather than waiting for the electricity board to send someone in (quote 11). Such actions bolster feelings of agency in a situation that has the potential to make residents feel helpless.

Local people are mentioned in all of the interviews and were explicitly mentioned in eight of the interviews as trusted sources of information. Others in the local community provide important reference points for older people, who are usually less likely to rely on information from the Internet than other groups. The high levels of social capital reflected in the interviews and the frequent references to meetings and the flood group indicate that residents generally felt 'in the loop' about events and able to contribute to decisions around town life, either through attending events themselves or by relying on trusted neighbours or family members to provide them with important

information (quotes 10 and 12). There were frequent references to 'worse off cases' (which in part relates to the issues raised in section 5.4 below), but these wider frames of reference beyond the individual experience reflected a strong sense of community and high levels of interaction with neighbours. This facet of what living in Keswick following the flood was like highlights the importance of the social elements of place, both for psychologically framing a stressful event and dealing with it practically afterwards. This aspect of place relates to Rowles' (1990) concept of 'social insideness' as an aspect of place attachment for older adults. Social insideness 'arises from everyday social exchanges and the creation and maintenance of social roles within a neighbourhood over a long period of time' (Rowles and Chadbury, 2005:29). The general impressions that emerged from all of the interviews were those of a well-connected community (Q14), increased social insideness following the flood (Q15) and a high level of social capital underpinning a strong sense of agency amongst residents (Q12). This sense of community provided a level of security and continuity for most interviewees, and this has been actively reinforced in exchanges following the flood.

However, social connections did not only help with the recovery process in terms of offering shelter and mobility. Social connections were also the medium through which most residents heard about flood defence plans. As Mihalyov and Perkin describe, environmental perturbation is not just experienced at the individual level, it is also interpreted at the individual and community level: 'The community-level interpretive processes take place in the networks and social interactions in the place' (2013:79). This process of understanding and interpreting place-related events after a disruptive physical event was borne out in the interviews through, for example, participant F's reference to her son analysing and offering his opinions following the flood discussed later in the chapter, and participant D's description of residents speaking to central community members in order to get information and understanding about the flood wall discussions. This construction of place and flooding through dialogue is also apparent in the earlier example of interviewees deferring decisions about relocation to family members; risk is perceived through family members'

eyes. In this way, the narratives about the flood and their impact were to some extent co-constructed. For older adults who are reliant on family members and members of the community, this can significantly contribute to how a place is perceived. The individuals that some of the interviewees rely on act as gatekeepers that increase a sense of control and knowledge, however in doing so they also filtered and shape the information they received about the flood and its impact.

Keswick is a relatively wealthy town, and so whilst this sense of connectedness and civic involvement may not be representative of older adults in other towns it was certainly evident in the responses of the interviewees who participated in this research. The social connectedness of the interviewees impacted on how they perceived Keswick and the floods, and, for these older adults, while they were exposed to flood risk they were made less vulnerable by the support provided by their established social networks.

Quote no.	Quote	Participant
Q8	*'I moved up [stairs] that night, but really I wouldn't have moved out but my nephew came round and he'd been flooded from the houses across that way, he managed to get a holiday flat for 6 months to rent, and he insisted that I went.'*	H
Q9	*'When I was talking to a neighbour at the back who is now in her 80s, she has two daughters who live within 20 miles, it turned out that when we knew the flood was coming lots of people phoned up her neighbour who is of a similar age and asked if she wanted help because her family was in the midlands. No one rang Lillian up because they assumed her daughters would help, but she said her daughters couldn't get there in time and she had to fend for herself.'*	D
Q10	*'Chris Guy comes to mind who has been the secretary to the flood action group ever since we first had meetings after the 2005 floods.'*	E
Q11	*'I got on the phone, and made our neighbours, saying this was rubbish [that there was no electricity] and would take weeks [to fix]. Our electrician luckily heard of this and popped round straight away.'*	D
Q12	*'And Keswick is good at that its got a very high proportion of retired professionals and we all have our different little niches. I chaired the market town regeneration group for a number of years and we were able to get things done'*	K
Q13	*.They are very much working on behalf of the community but because of that people tend to go to them and if they meet them in the street to let things pour out at them and also they go to a lot of meetings like the Penrith one.'*	D
Q14	*'Well cause I love it here, look at the view I have out there, might never get it again I keep telling myself . . . Just everything about it, I mean I'm handy with the shops, my neighbours they're lovely, I mean I would hate to move from my neighbours . . . That side I've got a widow, but I've known her all my life. They're nice you know, if they haven't seen you for half a day they'll ring you up to check everything's alright.'*	H
Q15	*'But there was a good sense of neighbourliness throughout that whole crisis. People tended to be more talkative and more understanding of people's problems, it was quite good from that point of view.'*	J

Table 5.3: Illustrative quotes for social capital and networks

5.3 Physical limitations when dealing with floods and flood risk

The physical constraints of older adulthood influenced how participants framed their experience of the flood and of living in a flood risk area. Even though the participants generally reported feeling they had agency in the face of flood risk, they had particular concerns around living conditions and their attachment to their homes. The flood event changed some elements of everyday life. Participant F, a flooded resident, had a particularly negative experience of the flood since her husband died soon afterwards. She was particularly aware of the fact that she was not able to move her dog upstairs if she needed to (her dog was not able to climb the stairs) and this was a significant concern every time she received a flood warning or Keswick experienced heavy rainfall. This interviewee also mentioned the heaviness of the household flood defences, and the difficulty she had putting them in place. For participant F, the flood made her feel helpless by highlighting aspects of her physical limitations that would not necessarily have been brought to light were it not for the flood event

As discussed in section 5.1, older adulthood introduces and amplifies the importance of particular aspects of place dependence: flat roads become more appealing; proximity to shops becomes more important; and the characteristics of a house become important. Many older adults choose to live in bungalows (five of the interviewees lived in bungalows). In terms of adapting to flood risk, bungalows introduce a particular limitation since residents are not able to move themselves or their valuables upstairs to keep them from being damaged. While bungalows are more functional for older adults, they also increase their vulnerability to the impact of floods. In the case of participant M (quote 17) this vulnerability was somewhat ameliorated by the offer of a neighbour who said they could shelter at their house.

Difficulties with transport and mobility did, in two cases, reduce feelings of agency. This was specifically related to the control participants were able to

exert over the transportation of their belongings following the flood. In participant F's case, a lack of control over what happened when her house was being cleared following the flood contributed to a sense of helplessness and distress (quote 18).

Seamon (2013) writes about the importance of the inward and outward aspects of place when people discuss their relationship with houses and homes: 'The typical home in contemporary Western societies is a realm of personal and familial privacy mostly insulated from the larger public world; its occupants are typically in control of what aspects of that larger world have entry into the home [. . .] The inward aspect of any place relates to its being apart from the rest of the world, its more outward, externally oriented aspects relate to the larger world of which it is a part' (2013:15). For four of the respondents interviewed, this threshold between private and public spaces was violated due to response to the flood from external sources (quotes 18 and 19). Participant J lived in a listed building, and this meant that the local environment officer was able to forcibly suggest changes and renovation techniques, taking the decision-making power out of the hands of the resident. This experience was particularly upsetting and the participant talked about it at length, explaining that he wanted to talk about it to as many people as possible so that word would get back to the environment officer. He discussed feeling at a loss following the flood, and said that this sense of loss was compounded by an insensitive outsider.

Two other participants discussed the loss of personal items after the flood though the actions of outsiders who had not properly determined what items were important. For participant F, this had meant that important personal items were lost and this exacerbated an existing sense of helplessness. As Brown and Perkins (1992) explain, our identity is anchored to the items that our houses are furnished with: homes and their furnishings are essentially extensions of oneself through place. When a home is cleared out and managed by outsiders, these anchors and the power individual residents normally have over their living spaces is undermined.

This is a particularly pertinent point when focusing on older adults. Firstly, following a flood event older adults are often less able to be involved directly in the recovery operation and they often have to rely on family and friends or outside agencies to deal with the post-flood operation. Secondly, the physical limitations of being an older adult often mean that the home environment is their primary living space, making it particularly important to their feelings of security and continuity (Rubenstein and Parmelee, 1992; Oswald and Wahl, 2005). To have your home environment changed significantly with little input has a disorienting effect in an already stressful situation. Contamination or saturation by floodwaters often mean household items are unsalvageable, but it is possible to make sure residents are involved in the decision-making process around what items are thrown out; the rationale for any such decisions should be fully explained to the residents.

Another way in which the physical demands of age affect adaptive capacity is in the perceived inability of older people to move house. Whilst most interviewees displayed resilience in the face of flood risk, three interviewees acknowledged that, because of their age and the stress it would entail, moving house was not a viable option (quotes 20 and 21). When discussing the possibility of moving house, difficulties related to age were used by interviewees to frame their responses. The stress that a move could entail in old age means that some interviewees prefer to stay where they are, feeling that their age keeps them from moving to a less risky area. In this way, older adults are particularly vulnerable to getting locked into flood risk areas, as they may not have the sense of agency needed to move to a less flood prone house or area. As discussed in section 5.1, non-flooded residents often detailed how flooded residents are tied to their houses, unable to sell; three flooded interviewees indicated that this feeling of being tied is true. However, it is not simply a case of not being able to sell because of flood risk; wariness of the effort involved in moving house is also a factor.

As discussed in section 5.1, place attachment, dependence and identity interact at different scales to make certain parts of Keswick particularly attractive to elderly residents. Old age makes certain aspects of household living more salient, shaping both how floods are experienced in the house and how the house itself is experienced in the aftermath. What is clear is that residents viewed their houses differently after the flood; place identity at this scale has been undermined, for most, this difference could be coped with and accepted. However, significant stress is caused when the shift in how the resident views their home is very large (e.g. participant F) and this severely limits residents' capacity to adapt to future flood risks.

Quote no.	Quote	Participant
Q16	'I get worried when there is a flood warning; I get worried about my rescue dog. Cause she won't climb stairs, so the last flood warning I put her in the car and took her round to the vets . . . I've had a pump fixed in our son's bedroom, but it's too heavy for me to take out.'	F
Q17	'When we were told to get out this time, of course being a bungalow . . . we've got no upstairs, but the people next door said come and join us which we duly did.'	M
Q18	When they're doing things you can tell what's going on . . . No one can get over this. They didn't take any note of what they threw out, but the insurance company have been good, but I can't be sure of what I've lost . . . I don't really think they knew what they were doing, because I said save this, save that, if I'd have been here I would have said 'what are you doing?''	F
Q19	'I lost my carpets both in here and on the staircase. I've got two staircases, they were both lost . . . and I lost all my kitchen equipment. That['s] the sad thing about when the restoration come in, they just throw everything in the wheelie bin. It's cheaper to pay for a replacement then to actually sanitise everything, you know.'	J
Q20	'No, nothing will make me want to move house now in my old age. Well mind you if I was flooded actually, just worrying about it . . .'	C
Q21	'Yes I wouldn't stop here anymore. If we weren't our age we'd move somewhere. No, not a great deal I don't think, my son [is] going to get shot of it when we're gone, [but] he doesn't want to live here, I've told him 'no' to get up higher in the town'	H

Table 5.4: Illustrative quotes for the physicality of floods

5.4 The inoculation effect

While age can constrict certain aspects of interaction with place and adaptive behaviour, life experience can contribute positively to the psychological framing of floods and flood risks. A theme that emerged in many of the interviews was that many of the participants leant on and framed the flood against their life experience, and that autobiographical details relating to place formed part of these narratives.

Some studies indicate that while elderly people may be more vulnerable to flooding physiologically, they can also be resilient and can cope with hardship and disasters (Huerta and Horton, 1978). For physically healthy adults, experience of flood events in the past may mean that they have in a sense been 'inoculated' by previous stress, making them resilient to further events (Eysenck, 1983; Norris and Murrell, 1988). Previous stress factors such as flood events or simply living through more frugal times may cause older adults to develop an internalised locus of control when it comes to extreme events. In the interviews, while the physical impacts of floods were noted, most participants seemed psychologically robust in their attitudes to flood risks. The participants often understood flooding as an inevitable risk when living in an upland area, discussing previous flooding in and around the local area (Q22).

Many of the interviewees considered the flood as part of a wider temporal picture, commensurating the experience with other events and stressors they had lived through. This process of framing the flood as part of a tapestry of previous life events seems to have lessened the psychological impact the flood had on participants; additionally process provides a sense that they know they have the psychological resources to cope if such an event were to happen again. This framing of the flood supports Tuohy and Stephens' findings that narratives about flood events provide the opportunity for the 'expression of agency and mastery, which [...] can be more difficult to maintain in later life' (2012:33). A desire for a consistent identity therefore means the impact of a flood is framed

in a manageable way. The narrative of self-reliance in old age is discussed in other studies (Wolf et al., 2010). In this case study, it seems that such narratives are integral to perceptions of efficacy and control. Participant D's interview (quote 25) reflects what is implicit in many of the interviews: an awareness of the uncertainty of rainfall, which brings with it acceptance that flood events may happen again in the future. This acceptance of the negative aspects of living in Keswick may not reduce vulnerability to flooding, but it does reduce the psychological strain of living with flood risks.

This resilience in the face of flood risks was also closely linked to the ontological security provided by community networks and local knowledge (section 5.2). Local knowledge in this discussion refers to knowledge about the physical geography (both natural and man-made) of the local area and local weather patterns (see Table 5.5 for examples). Over half of the participants demonstrated detailed local knowledge and this knowledge informed narratives about the floods. In terms of agency, local knowledge contributes to confidence and understanding in terms of interviewees' relationship with the area, and helps them to rationalise floods and their causes. This does not take away from the very real impact of floods, but nevertheless introduces an element of comprehension and control in what could feel like a helpless situation. In terms of what attracted the participants to live in Keswick, the physical landscape was very important for newcomers. In terms of adaptive capacity, psychological resilience helps significantly when dealing with flood risks and their repercussions. By considering the flood within the context of what they know about the local landscape and being able to describe its impact on themselves as part of a larger narrative, interviewees were able to maintain continuity and, subsequently, well-being. This does not hold true for all older adults and, in this sample, one participant had suffered significantly as a result of the flood and the events around it (participant F).

The processes of placing the flood within a longer timeline of life in Keswick and of detailing the physical features of Keswick are two examples of the 'autobiographical insideness' and 'physical insideness' that place holds for the

elderly as described by Rowles (1990). To gain physical insideness a detailed knowledge of the physical landscape is needed; movement through the landscape is, to some extent, taken for granted. Autobiographical insideness refers to the ability to recall various experiences relating to a place, both in the past and present. This relates to place identity, where a place essentially becomes an extension of the self. Viewing Keswick through Rowles' classification, it becomes clearer how a flood can shape an older person's relationship to place. A flood will alter physical insideness, as terrains previously negotiated without thought are brought to the attention of the conscious mind. In the case of Keswick, flooding made people conscious of very particular aspects of place, such as the difficulty of getting a pet upstairs or the unexpected difficulties of living in a low lying area. A flood event also shapes autobiographical insideness and vice versa since it adds another layer of meaning to the experience of being a resident in Keswick; additionally, it allows the floods to be framed in a way that is less threatening and easier to accept.

Quote no.	Quote	Participant
Q22	*'I mean you live in mountains: expect water.'*	G
Q23	*'People nowadays they just sit back and wait for handouts and what have you. Whereas I think it's since the war, I think the war brought people together in a common aim to help everybody.'*	H
Q24	*'Well, you see everybody's affected nowadays, years ago nobody was bothered, they just accepted the flood, as I told you, and as soon as the water went down, they just got the bleach out, cleaned the house out with bleach and got back to normal. There was none of the paraphernalia that goes on nowadays.'*	A
Q25	*'Nothing's certain in this life, and what we're all conscious of is that although the* [river] *Grita has always overflowed.'*	D
Q26	*'Most of the town you see is away from water. Yep. I've watched developments go on down there all these years. You see the road down there, you think nothing of it being that way, well when I first came to Keswick it was only as wide as half, and it was a known fact that every winter without fail sandbags were put on the doorsteps of the old cottages down there just in case there was some flooding, simple as that.'*	G
Q27	*'We've been fishermen all our whole lives, my son and me, and we've seen it all happen before, well if it wasn't cleaned out years ago there was always floods.'*	C

Table 5.5: Illustrative quotes for the inoculation effect

5.5 Summary

This chapter focused on a particular subset of the population and their experience of a flood. The impact of floods on place based social connections corroborates with findings in Chapter 4 (section 4.1.2). Family informed individuals about the proposed flood wall, and discussed the options with them; family members or respected local people are go-to points for information. From the interviews, it would appear that social networks do not only help in the recovery period following a flood; indeed, their importance was reinforced and brought to the foreground repeatedly when participants were discussing Keswick. Place attachment to the wider physical surroundings (the Lake District) appears unchanged, however, attachment to the place based community seems to have been strengthened by the flood. Existing bonds became stronger and new bonds were formed. When a disruptive event such as a flood happens, pre-existing bonds are reinforced as long as the impact is not too severe (i.e. residents are not forced to relocate).

Rowles' model of place attachment amongst the elderly is useful when considering the relationship between the experience of a flood and what place means for older adults. As described above, Rowles used the three dimensions of physical, social and autobiographical insideness to break down the different aspects of place attachment amongst the elderly. These dimensions of place determine how individuals perceive a place, as well as their capacity and willingness to live in or near it. For the residents interviewed, the perceptions of the physical aspects of place have been shifted by the flood. The mildest shift experienced is that some residents have become more aware of what areas of the town are vulnerable to flooding; the most extreme shift is that one resident now have an ever present anxiety around their capacity to manage their house and belongings in the event of a flood. For these residents, physical insideness has been altered in a way that has negatively impacted on their well-being; the shift has been particularly significant since it has completely altered how place is experienced, in

particular at a household level. The social insideness of being a Keswick resident also changed for the interviewees. As discussed in detail in section 5.2, social connections are key to how the flood has been interpreted and have themselves been altered following the flood as new connections have been made. For most of the residents interviewed, in particular the flooded residents, social insideness has changed in a positive way following the flood. The social aspects of living in Keswick have become more significant in daily life and these new connections have resulted in increased feelings of agency. The third dimension that Rowles discusses is autobiographical insideness: the attachment that develops with the experiences and activities individuals associate with a place over time. How the flood affects this facet of place for the older adult remains to be seen, as it can only be captured retrospectively; however, this type of place attachment was significant for the interviewees as they viewed the flood within the wider framework of their life experiences in Keswick. Responses suggest that the experience of the 2009 flood will further strengthen this aspect of place attachment for most of the interviewees.

What is also evident from these interviews is the dynamic nature of relationship with place following a flood. Place attachment appears relatively unchanged, however place identity and place meaning has changed somewhat. While many people were drawn to the area by the physical landscape, it is the social elements of place—the social insideness—that most people refer to when reflecting on their time in Keswick. Following the flood, connections were created, renewed and strengthened. Rowles' three aspects of place interplayed with each other in a particular way for each resident; in some instances, attachment to Keswick as a place increased and the form of the relationship with place altered in a way that improved adaptive capacity, for example social and autobiographical insideness had developed, and this improved psychological resilience to the flood event. Where the three dimensions of place were altered in a manner that reduced well being in relation to place, for example where physical insideness had been undermined, adaptive capacity seems to have been reduced; specifically, a sense of learnt helplessness set in. These interviews give an insight into how a

relationship with place can affect how a flood is experienced, and also how living through a flood will itself affect how place is experienced. In the extreme, these dynamics have reduced adaptive capacity in cases where the relationship with place has shifted to reveal vulnerability. Generally, the flood experience has revealed a psychological resilience that has, to some extent, expanded residents' relationship with place and subsequently improved their adaptive capacity.

Chapter 6: Discussion: How relationship with place shapes adaptation to flood risk

6.1 Introduction

The results presented earlier in chapters 4 and 5 describe the main research findings: the nuanced nature of people-and-place relationships; the way context influences how flood events are experienced; and how a flood interacts with individuals' sense of place. This chapter discusses how these results can contribute to the literature around how place is understood and measured. Firstly, the affect of floods on place attachment and place meanings will be discussed. This section will address attachment to place at both the town and household level. Secondly, the discussion will focus on the relationship between place attachment and expectations around flood risk. The role of trust in place-related governance structures and how place attachment relates to accountability will also be discussed. Thirdly, the discussion will address the relationship between place attachment and people's involvement in flood management planning decisions. Finally, these aspects will be analysed through an adaptation lens and the role people's relationship with place plays in either enabling or constraining adaptation will be discussed.

6.2 The affect of flooding on place attachment and place-related meanings

The range of literature explored in chapter 2 demonstrates that place has been defined in a number of ways between disciplines. One delineation referred to in chapter 2 (section 2.2.2) is whether research focuses on the strength of emotional bonds with place or whether it focuses on the meanings that a place holds. This section addresses research question three; question

three is addressed first as the results for this question give additional insights into the answers to first and second research questions, which are addressed in section 6.3 and section 6.4 respectively.

There is very little research into the relationship between place attachment (defined as the strength of an individual's relationship to place) and flooding; the author is only aware of one paper that explicitly addresses place attachment and flood preparation (Mishra, 2010). This thesis suggests that the strength of place attachment amongst residents in both flooded and non-flooded areas is similar; both the flooded and non-flooded residents consulted had, on average, a positive relationship with their towns. So whilst a flood is a significant environmental stressor (Cockermouth in particular experienced prolonged flooding related disruption), residents demonstrate positive place attachment two years after the floods. However, while strength of attachment seemed relatively unaffected by the floods, place-related meaning seems to have changed significantly: descriptions by flooded residents in both Cumbrian locations reflected an increased awareness of and appreciation for place-based social connections. In Keswick, for example, strength of attachment to the town and the surrounding area appears to have remained positive following the flood, however the everyday experience of living in the town seems to have changed as a result of the increased social connectedness experienced by residents during and after the flood. Previous research has demonstrated that place meaning changes following a flood event (Brown and Perkins, 1992; Burley et al., 2007; Tapsell and Tunstall, 2008; Carrol et al., 2009; Tuohy and Stephens, 2012) and the findings in this thesis support and contribute to this body of research.

The importance of place-related meaning and how it is affected by flooding was clear from the findings in Cumbria. In Keswick, family and community members were reference points that determined how residents interpreted the severity of the flood and perceived planning developments. The role family and local community members play in determining the reception and interpretation of information about the flood (and choices around flood

management options) is discussed in section 5.2, and indicates how narratives about floods are formed. Both flooded and non-flooded residents discussed the flooded areas in terms of people being trapped or unable to move, and for non-flooded residents descriptions of living 'sixteen higher up' (Quote 6) reinforce the divide between the different areas in Keswick. In Keswick, the floods were in part interpreted at the community level and this emphasised the importance of the collective experience of a disaster (McFarlane and Norris, 2006; Mihaylov and Perkins, 2013). Place meanings and place change are informed and reinforced through dialogue with others. Through these social processes, flooding has a direct impact on how place is experienced. The floods made social aspects of living in Keswick more salient for those affected both directly and indirectly.

Social connections are an important element of place attachment and place identity. As chapter 2 (section 2.2.3) sets out, definitions of community and place attachment often overlap with each other. Perkins and Long state that they 'view place attachment as distinct from sense of community because the former is a spatially oriented emotional construct and the latter is more of a socially-oriented cognitive construct' (2002:297-298). However, the findings in chapters 4 and 5 suggest that untangling socially and spatially oriented emotions in Keswick is extremely difficult. In this sense, the findings of this thesis corroborate Scannel and Gifford's definition of place attachment below:

> 'The person dimension of place attachment refers to its individually or collectively determined meanings. The psychological dimension includes the affective, cognitive, and behavioural components of attachment. The place dimension emphasizes the place characteristics of attachment, including spatial level, specificity, and the prominence of social or physical (both built and natural) elements.'
>
> (Scannell & Gifford, 2010:1)

The findings presented here suggest that in terms of understanding the relationship between place and flood risk, the meaning mediated model is particularly useful (Stedman, 2003). The strength of place attachment provides a useful indicator; however, it does not discern what it is about a place that people are attached to and how the attachment may change following a flood experience. The variation in the responses between the flooded and non-flooded residents is particularly enlightening in terms of showing how relationship with place is focused or experienced following a flood event. Although attachment was still generally positive for flooded residents, their description of the town was more likely to focus on its people than its physical characteristics or amenities. This aspect of place attachment was also reflected in the in-depth interviews: narratives about the floods often included stories about neighbours and descriptions of increased familiarity following the event.

These findings suggest that strength of attachment to an area is not enlightening in understanding how place change is experienced following a disruptive event (Scannell and Gifford, 2010). It is through more qualitative work, or very nuanced place scales that focus on place meaning that greater in-depth understanding can be achieved. The flood may have changed the symbolic base of attachment for residents whilst not changing their overall levels of attachment. Stedman (2003) found this in his research on lake shoreline change; while lakeshore development changed the symbolic base of attachment to the lakeshore, it did not affect overall levels attachment. The findings Cumbria support this model, and suggests that when taking a positivist approach to measuring place it is important to include variables that explore place meaning as well as testing the strength of different types of relationship with place (e.g attachment, identity and dependence). In doing so it allows triangulation of data and a better understanding of how relationship with place informs related attitudes and behaviours.

An increased sense of connectedness was common amongst flooded residents: place identity seems to have become stronger. The social

insideness of flooded residents has increased, and where the experience has not been overwhelming the event is another experience that can be included in the narrative about living in Keswick (See section 5.4). What it means to be a Cockermouth or Keswick resident now has another layer of meaning, and this identity is, to some extent, shared with other flood-affected residents. The distinct impacts of flooding on the different aspects of residents' relationship to place are illustrated in Figure 6.1. Place meanings have changed both for better and for worse, but place attachment is still positive.

**Place attachment
has remained positive**

**Place meanings have
changed**

Individual

Attachment

Place Meaning
including social and
physical
characteristics
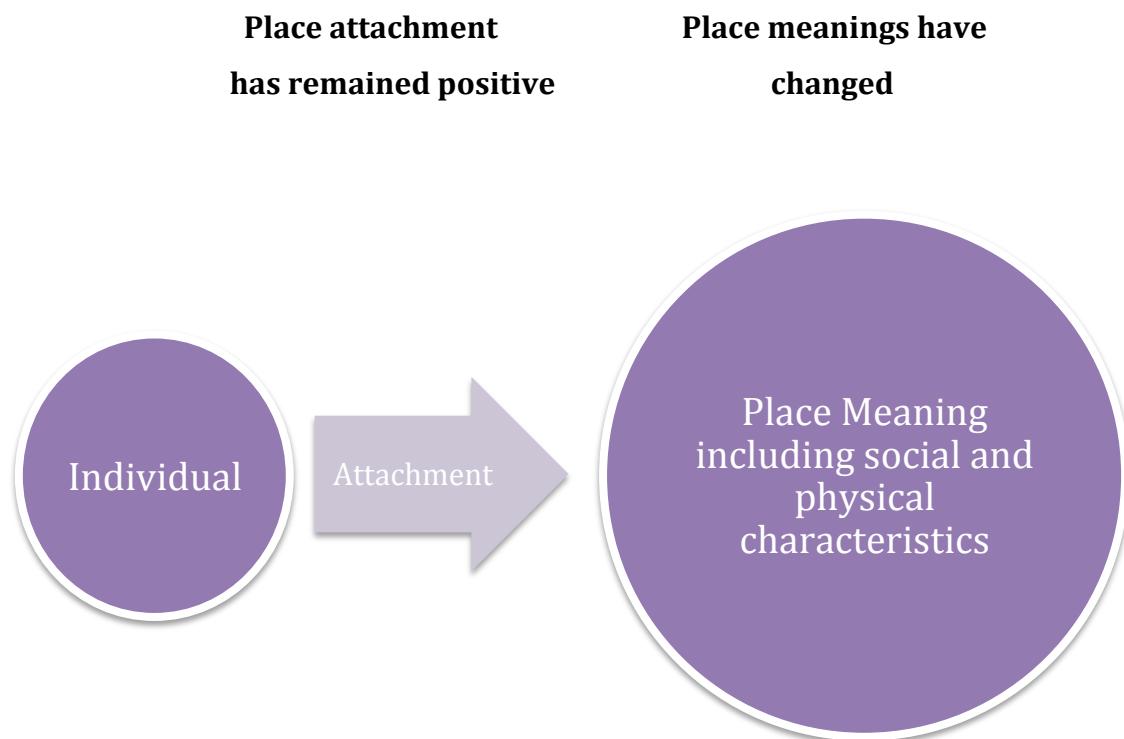
Figure 6.1: Changes in town level place attachment and place meaning after a flood event

6.2.1 How relationship with place can shape interpretation of a flood

Experiencing flooding in one's house and town affects place meaning and attachment for individuals. However, this is not a one way dynamic. In chapter 5 (sections 5.2 and 5.4), findings on the role of social networks and

the inoculation effect reflect that floods are collectively framed and interpreted. The descriptions Keswick residents give of their experiences of the flood event align with the meaning-mediated model of sense of place: it is not the objective features of a place that people become attached to, but rather the meanings a place's physical features represent (Stedman, 2003). However, the importance of social networks and the inoculating effect of previous experience suggest that the floods and their impact on Keswick were shaped by communication between members of the community, reflecting the role of discourse in forming place meanings (Van Patten and Williams, 2008).

As McFarlane and Norris (2006) suggest, disasters are collectively experienced. Place attachment and identity may not just be useful as well-being assets; indeed, they may also lay the foundations for more resilient responses to environmental stressors. For example, strong positive place identity may cause people to frame environmental stressors as part of a larger place narrative that includes references to more frugal or stressful times, a phenomenon demonstrated in Keswick that had an inoculating effect and reduced the psychological impact of place changes. If place meaning is generally positive, stressors are more likely to be re-framed in a way that ensures place meaning remains positive. This reframing also contributes to continuity of place identity, corroborating previous research on the role of narratives in interpretation of stressful events (Tuohy and Stephens, 2012).

6.2.2 The effect of flooding on perceptions of place at the household scale

At the household scale, this research suggests that the impact of flooding varies considerably between individuals. A third of the residents flooded in Cockermouth state that their house became more valuable to them following the flood – they have become grateful for features they had previously taken for granted. Residents describe being involved in the refurbishment of their homes (i.e. choosing flood resilient materials and furniture), a process that

increased their attachment; having invested time and interest in the recovery process, their sense of place identity is strengthened. However, this positive re-evaluation of homes was not experienced by the other two thirds of flooded residents; these residents now feel negatively about their home environments. This negative outlook was typified by the view that 'It's just a house now, it was a home before' (Survey 90). The flood has removed ontological security from residents (a concept discussed by Harries (2008)) and as a result residents are left with an uneasy awareness of their vulnerability to flooding. At this scale, the experience of a flood did not increase attachment for most respondents; instead, the meaning of their house has shifted significantly because direct experience of flooding has left them feeling insecure and, in a sense, trapped in difficult-to-sell houses.

For flooded residents, attachment to Cockermouth as a town is still generally positive; however, at the household level relationships with place appear to be negative. This disparity is significant for those who plan the recovery and rebuilding processes (which is discussed later in section 6.4). There are significant shifts in relationship with place (in relation to one's house) following the flood; the mechanisms that may be responsible for this were explored in more detail with Keswick residents.

In Keswick, similar to Cockermouth, the residents who directly experienced flooding also demonstrate a positive attachment to their town. As described above (section 6.2), their experience of the social element of place seems to have expanded and deepened in the wake of the flood. However, at the household scale, residents' relationships with place seem to have changed significantly. As discussed in chapters 2 and 5, gerontological literature offers many insights into ageing in place and the specific needs that older adults have in terms of their relationship with their surroundings. In particular, mobility and perceived inability to move home because of old age are particularly pertinent to how the Keswick interviewees perceive their houses. Not being able to get up stairs or move pets and furniture has made some residents aware they have a more limited or curtailed relationship with their

dwelling than they had previously thought. Previously unrealised limitations now inform how residents view themselves and how they interact with their living spaces. For one resident in particular, this introduced a feeling of helplessness and means she feels uneasy in her house. For other residents, old age prevents them from seriously considering a move to lower risk housing. Residents' self-perceived limitations around moving in old age mean they cannot move even if they would like to.

The salience of the physical aspects of place were largely determined by age, however other changes in household living following the flood were not. Residents essentially lost control over their household space following the flood. As Seamon (2013) discusses, an individual is largely in control of how their living spaces are managed, and their sense of identity and security is bound up in the items that furnish their house. Items gathered through the years contribute to a sense of identity and continuity, and ultimately contribute to well-being (Carrol et al., 2009). Losing these items suddenly can be debilitating, and strip a resident of the feeling of their house as a safe haven. This may, to some extent, explain the responses of the flooded residents in Cumbria where the everyday experience of ontological security in relation to place was compromised by the flood (Harries 2008). Following the flood event, residents are now very aware of the potentially transient nature of what was once a secure, safe place. This has the potential to leave residents feeling anxious about future flood events, and undermines their positive attachment to their houses. This feeling is compounded when outside agencies deal with familiar and valued items in a seemingly insensitive manner, breaking down the usually upheld division between private and public spaces that contributes to feelings of control within the personal sphere. These findings concur with previous work on changes in individuals' perceptions of home following flood events (Harries, 2008; Carroll et al., 2009) and a growing body of literature that focuses on the psychological effects of flooding, in particular how a flood event can affect relationships with place (Tapsell and Tunstall, 2008).

In summary, while the floods resulted in a new appreciation of home for some of the Cumbrian respondents, it had a negative impact on most residents' perception of security. The findings from this study reinforce the findings of other studies that demonstrate the psychological impacts of a flood associated with disruption of place continuity can last well beyond the actual flood event (Ohl and Tapsell, 2000; Tapsell et al., 2002; Tapsell and Tunstall, 2008). Additionally, this study reinforces how important it is that external agencies remain sensitive to individuals' perceptions of public and private domains (Carroll et al., 2009).

6.2.3 The effect of household flooding on sensitivity to town scale place change

The change in household scale place meaning for flooded residents in Cumbria was clearly apparent. Whilst place attachment has not become negative as a result of the floods, flooded residents in Cockermouth are less happy than non-flooded residents about physical changes to the town (see section 4.2.2). Non-flooded residents' focus on the positive change in infrastructure is different from flooded residents' focus on social ties (although it should be noted that non-flooded residents do still mention this). It would seem that non-flooded residents in Cockermouth consider the changes to the town to be minimal and generally positive. For flooded residents, the second and third most frequent responses referred to negative changes to the market place and the fact the town had not yet fully recovered respectively. The relevance of different aspects of living in Cockermouth varied between the two groups. Experiencing flooding in one's own house makes one more likely to reflect on social ties when considering life in Cockermouth, and also increases awareness of and sensitivity towards subsequent physical changes to the town. Flooded residents that do not have the stability of a familiar and safe house may be less likely to welcome physical changes in the town at a time when continuity is important. Natural disasters are disorienting for those who are affected (Cox and Perry, 2011).

Many of the flooded residents in Cockermouth do not like the changes introduced to the town after the floods which highlighting the significance of Cox and Perry's assertion that following a disaster 'In the midst of this disorientation, key decisions about the allocation of resources and future rebuilding efforts are being made that shape not only the immediate experience for survivors, but that have long term consequences for them and their communities' (2011:408).

Non-flooded residents, who describe the changes in town positively, have not experienced this disorientation to the same extent; they characterise Cockermouth positively by describing the new shop fronts, increased friendliness and a feeling of normality. The security of relatively unchanged household living circumstances perhaps means that refurbishment and development of the wider environment can be embraced and encouraged. This introduces the possibility that flooded residents have been significantly impacted twice by a flood, first at the house scale (with all the disturbances that can entail, as detailed above) and secondly at a wider scale. At a time when victims of flooding need continuity, town or community planners have changed familiar environments, albeit with the best of intentions. Work on people returning to New Orleans following Hurricane Katrina suggests that the cultural capital tied to place meaning for individuals is particularly important to those with lower levels of other types of capital (Chamlee-Wright and Storr, 2009). Therefore, it is crucial from a fairness standpoint that changes to communal areas are made consciously and sensitively, at the very least taking into account the full range of local perspectives when rebuilding. Whilst quick recovery is desirable, it may be far from optimal for vulnerable sections of the population.

6.2.4 The effect of flooding on place attachment and place-related meanings: summary

This research indicates that flood events do not appear to significantly change overall levels of attachment to place at the town scale; however, they do change place-related meanings. In both Cumbrian locations, floods resulted in an increased appreciation of the social elements of place. Flooding at the household level can make people more appreciative of their home, but is more likely to introduce uncertainty and anxiety to previously safe environments. Flooding at the household level affects how older adults view themselves in relation to place; in some instances, it reveals frailties and introduces a sense of helplessness. This is compounded when outside agencies are insensitive during the recovery process. For residents who experienced flooding in their houses, physical changes to the town were unwelcome; this suggests the importance of place continuity at the town level for residents who have experienced disorientation at home as a result of flooding.

6.3 Does place attachment affect perception of responsibility?

This section addresses the first research question that asks does strength of place attachment have implications on how people expect the distribution of flood management responsibilities to be handled? Place attachment has been demonstrated to influence attitudes to place and place protective behaviour (Stedman, 2002; Halpenny, 2010). Within a flood management context, the research in this thesis considers whether attachment to place means that people are more likely to be actively involved in decisions around prospective and reactive place changes. Before addressing involvement, we consider: does place attachment affect *who* people feel are accountable for managing places?

As Manzo and Perkins suggest: 'Studies of community-level place attachments, their disruptions, and subsequent citizen action underscore the fundamentally political nature of people's connections to their community […] Consequently, environmental and community psychology studies on the intersection of the politics of place and place attachments warrant further exploration' (2006:340). The political nature of people's relationship with place has been underlined by several studies (Cheng et al. 2003; Manzo, 2003; Manzo and Perkins, 2006), yet there appear to be no studies that test how relationship with place affects how individuals feel responsibility for the management of particular places should be distributed in the face of environmental hazards.

Trust in institutions and factors that determine trust have been demonstrated to be important mediating variables in relation to attitudes to place change (Payton et al., 2005; Devine-Wright and Howes, 2010). In Barnes, place attachment related to trust in the local council to manage flood risk; however, in Cockermouth this relationship did not stand. In Barnes, a positive sense of place correlated with trust in Richmond Council. In Cockermouth, it is possible that the experience of being flooded undermined the relationship between attachment and trust, since experiencing a flood is likely to challenge pre-existing relationships between residents and governing bodies (Adger et al., 2012a). Flood events can shift the implicit social contract between the state and citizens. However, it may be the case that in Cockermouth this relationship (attachment-trust) did not exist to begin with and further qualitative research would be needed to determine this. It is clear in Cockermouth that attachment to the town and positive perceptions of local community members do not feed into trust of the local council, or an expectation that they will manage flood risk. In this case, positive place attachment does not directly relate to an expectation that the local council will manage flood risk.

Interestingly, a positive sense of place did not necessarily mean homeowners felt they should be responsible for flood risk management. Over 75% of

residents across all groups (i.e. residents in Barnes; flooded residents and non-flooded residents in Cockermouth) agreed that local governments and other institutions should manage flood risk in the coming 25 years. Agreement that homeowners should be responsible varied: 39.2% of Barnes residents, 52.6% of flooded respondents in Cockermouth and 66.3% of non-flooded residents in Cockermouth agreed. It is interesting to note that trust in the institutions that are responsible for flood management was relatively low in both areas. Cockermouth residents had relatively low levels of trust in organisations: ratings for the local councils, the Environment Agency and the national government did not exceed 55% (see section 4.4). In Barnes, the Environment Agency was the only body to achieve a percentage that exceeded 50% (at 64.3%). These relatively low levels of trust in civic bodies to manage flood risk did not mean that residents were more likely to attribute responsibility to homeowners.   In Cockermouth and Barnes, residents' relationship with place did not predict their attribution of responsibility for flood management. This point is particularly pertinent as responsibility for flood management shifts downwards, moving outwards from central government towards citizens across the UK (see section 3.3)

6.3.1 Place attachment and expected distribution of responsibility: summary

Understanding place as political (Manzo and Perkins, 2006) highlights the importance of understanding the impacts of how different actors manage place meaning and possibly place attachment. Could attachment to place incorporate, on some level, trust in local bodies and/or an expectation that these bodies will help to manage such places? If place attachment is to some extent related to people's perceptions of accountability when it comes to place management, it could possibly go some way towards explaining place place-related behaviour and management.   However, the results from this study found there to be no relationship between place attachment and expected distribution of responsibility. In Barnes, while place attachment

does relate to trust in Richmond Council to manage flood risk it did not relate to an expectation for them to take action. Being attached to one's local town does not entail neither an expectation that the local council will manage flood risk , nor an expectation of homeowners to do so. Residents' affective and emotional bonds to towns do not appear to relate to their expectations surrounding responsibility over their management of flood risk, from either the political bodies or the homeowners (with reference to flood risk).

6.4 The relationship between place attachment and involvement in flood management decisions

This section addresses the second research question and moves one step on from section 6.3 to consider whether place attachment can explain involvement in behaviour and behavioural intentions related to flood management.

The relationship between place attachment and place-related behaviour is sometimes ambiguous (Lewicka, 2011). The expectation that a strong positive relationship with place will act as a motivator for behaviour generally aligns with Manzo and Perkin's proposition that "Our thoughts, feelings and beliefs about our local community places – what psychologists call 'intra-psychic" phenomena- impact our behaviour's towards such places, thus influencing whether and how we might participate in local planning efforts" (2006:336). The reason for sampling flooded and non-flooded areas was to build upon the premise outlined in other research (Milligan, 1998; Chamlee-Wright and Storr, 2009) that certain elements of place become more salient when a destructive or disturbing event occurs. Therefore, attachment to a place is more likely to be a driver of behaviour when the individual is consciously aware of how important the place is to them (Chamlee-Wright and Storr, 2009). As Cox and Perry describe in their research into the impacts of forest fires and victims' realisation of the significance of place in everyday life: 'The

illusion of permanence, predictability, and stability that is established through routines and the structuring of familiarity was unmasked" (2011:400). Section 6.3 describes how place attachment does not appear to influence how people feel responsibility should be distributed for flood management: being attached to a town does not predict an individual's views on who should take on flood risk management responsibility (for example, the local council or homeowners). Whilst place attachment does not seem to affect residents' expectations of responsibility in Barnes or Cockermouth, analysis reveals that it does relate to individuals' involvement or willingness to be involved in the behaviour relating to the planning processes around flood management.

In the case of Barnes, relationship with place directly correlated with a willingness to be involved in flood management decisions. In Barnes, proactive planning will result in residents with a higher place attachment being more likely to get involved in the planning process. This may partly reflect that people are more likely to state willingness than actually undertake a behaviour, but the relationship stands across the range of behaviours, and is stronger when controlled for belief in increased flood risk. In Barnes, place meaning and attachment did not need to be made salient by a disruptive event for there to be a clear correlation between place attachment and willingness to be involved in flood management decisions.

The study in Cockermouth offers useful insights, with both flooded and non-flooded interviewees being impacted (either directly at a household level or indirectly at a wider community level) by the flood. For both groups, length of residency correlates with the strength of place attachment – the longer a resident has lived in Cockermouth, the greater their attachment to and identification with the town. However, the flood seems to have affected other relationships between residents and how they relate to the town.

For non-flooded residents, length of residency relates to social capital levels (for flooded residents, this did not stand). Additionally, the social capital levels of non-flooded residents correlates with their involvement in the

decision-making process, concurring with the many examples in the literature that link social capital and civic activity (Lewicka, 2005). The same was not true for flooded residents. Whilst flooded residents were more likely to state the community had been brought closer together by the flood (see section 6.2), this increased familiarity did not relate to involvement in community level flood management. Understandably, being flooded at the household level can be a debilitating and difficult experience. However, place attachment to Cockermouth was still found to be positive. Therefore, whilst direct experience of flooding has affected flooded residents' self-perceived agency and the role of social capital in their involvement in planning decisions, the strength of their affective bond to place seems to remain relatively unchanged.

The role of place attachment in residents' involvement in the planning process varied between flooded and non-flooded residents. Interestingly, in Cockermouth non-flooded residents' belief in increased risk made it more likely that place attachment would positively relate to their involvement in the flood management process – if non-flooded residents believed flood risk would increase in the future, they were more likely to have been involved in planning decisions. For flooded residents, the belief in increased risk did not affect their involvement in planning decisions. It may be that their direct experience of a flood means flood risk is already salient in this group.

It is only when the sample is limited to flooded residents with high social capital and trust in institutions that place attachment predicts involvement in the decision making process: for flooded residents, involvement is dependent on social capital and a belief that the local council will manage floods effectively over the coming 25 years. The need for these conditions to be met before place attachment is reflected in behaviour is to some extent, understandable: the direct effects of flooding leads to interaction with various bodies (local councils, the Environment Agency etc.) and if residents' expectations of these bodies are not met, their trust in them and their subsequent willingness to contribute to adaptation actions are likely to be

undermined. Like the attitude-behaviour gap (Blake, 1999), flooded residents' relationships with place do not seem to be directly related to their involvement in planning around flood management. Whilst the affective and cognitive attachments are still there, the mechanisms that drive individuals to action are missing; this would suggest an extension of Lewicka's proposition that 'It is not enough then, to be fond of a place, a locally based social network is necessary to convert emotion into action' (2005:392); trust in relevant actors is also necessary if people directly impacted by flooding if flooded residents' place attachment is to manifest in behaviour.

In summary, the results from Cockermouth and Barnes illustrate that a disruptive event can affect the influence place attachment has on involvement (and intended involvement) in decision making processes. Quantitatively, the level of place attachment is similar across both Barnes and Cockermouth. In Barnes, there is a direct relationship between place attachment and willingness to be involved in the proactive planning process. Non-flooded residents in Cockermouth need the risk of flooding to be salient before their level of place attachment influences their contribution to flood planning. The direct experience of household flooding seems to have undermined a number of relationships flooded residents hold concerning length of residence and social capita – these are relationships that were observed in non-flooded residents. For the flooded population, place attachment appears to only be reflected in planning-related behaviour when several prerequisites are met. In times of stress, place attachment does not explain behaviour; social capital and trust in governing bodies are more important.

6.4.1 Relationship between place attachment and involvement in the flood related planning processes: summary

In Barnes, residents' place attachment was related to their willingness to be involved in flood risk planning. The results from Cumbria suggest that if place attachment and identity are to result in active participation in reactive

adaptation decisions, certain conditions need to be met so people can contribute to the process – in terms of social capital and trust in institutions. On a positive note, residents' place attachment to their local town appears relatively unaffected by their experience of flooding. This is potentially an asset that can be harnessed in the decision-making process if other elements are recognised and cultivated. This research question was addressed using psychometric variables as is common in environmental psychology approaches to place research, and the findings align with Lewicka's (2005) suggestion that the cognitive and affective dimensions of place are mediated by other social and economic assets. These findings do suggest a limitation to place attachment's explanatory power for behaviour when other variables are not taken into account opening up further avenues of investigation that sits within the wider environmental psychology literature.

6.5 How understanding relationships with place can enable adaptation to flood risk

The research in this thesis sits within the wider issues of climate-related change. In the UK, flooding has been identified as the number one risk associated with climate change (HM Government, 2012). One example of planning for future flood risk is the Thames Estuary 2100 project, which involves flood management projects from the mouth of the Thames through to Richmond. In other areas, such as in Cockermouth (and now other locations affected by the more recent floods of 2012) the response has taken the form of reactive plans that aim to develop new projects or reinforce existing defences in areas that have already been affected by flooding. Given the emphasis in the literature on the contextual nature of place attachment, it is with caveats that the author makes suggestions about the wider implications of this study – Barnes does not represent all proactive adaptations, and neither do Cockermouth and Keswick reflect the nuances of all reactive adaptation projects. However, general trends and relationships are suggested by the findings in each location and provide useful insights into

how relationship with place can enable or constrain adaptation to climate change.

This research suggests that (in terms of anticipatory management) a positive sense of place relates to a willingness to be involved in flood management processes. This means that residents with strong place attachment are likely to try and influence decisions about their area. The other side of the coin is that residents with low place attachment are less likely to get involved in decision-making processes. In Barnes proactive planning that consults local residents is likely to reflect the place-related meanings held by people with strong place attachment. Place attachment is likely to contribute to procedural fairness if institutions and mechanisms are in place that enable people who want to be involved with decision-making processes to voice their concerns. However, distributive fairness may be jeopardised if non place-attached individuals do not contribute to place management decisions. As Harries and Penning-Rowsell (2011) suggest, there is a risk that the individuals that inform planning debates in the UK will constrain the range of adaptation measures used to address flood risk, preferring prevention over the reduction of vulnerability.

In Cockermouth, where adaptation is in part reactive, residents' positive place attachment did not appear to be related to their involvement in the planning process. Levels of social capital and trust in governance structures need to be present for place attachment to play a role in individuals' involvement in town level decisions. Place attachment as a predictor of behaviour was only present when social capital and trust in the local government are present. This highlights how local government bodies don't just affect residents' trust levels and satisfaction with decisions; they also influence people's willingness to be involved in discussions around flood management. Otherwise, flooding could be a doubly negative experience for flooded residents: they experience flooding in their houses and then, whilst they still retain positive attachment and identification with their town, are less likely to be involved in the decision-making processes that will affect them.

This research highlights the importance of town centre continuity at a time of change (see section 6.2.3). There is evidence that when people are displaced after destructive events, residents would prefer replication of structures that previously stood rather than new and improved roads and ergonomically designed buildings. Scannel and Gifford (2010) discuss the example of Xenia, Ohio, where local residents and businesses pushed for the rebuild following a hurricane to be as close to the structural layout that had stood prior to the hurricane as possible, over-riding suggested improvements to the layout of the town. This desire for continuity can be inferred from how Cockermouth residents discussed changes following the floods. From a place identity perspective, this can be viewed as an attempt to secure continuity during a disorienting period. This research suggests that particular attention needs to be paid by planners to what would normally be considered objective improvements in town centres following a flood event, especially if there are a significant number of residents who are experiencing change and uncertainty in their homes. This suggestion is directed in particular at cosmetic changes to streetscapes; structural changes that will improve the resilience of communities will require a more developed discussion around their benefits and drawbacks. Manzo and Perkins (2006) discuss Randolph Hester's community design work in North Carolina as a sympathetic method that involves community members in decisions surrounding local places. Residents were consulted through surveys and focus groups about the meanings and values they attached to certain places, and this meant both that residents had an active role in designing the plans and also that they had a say in what places were meaningful to them so they could be preserved. This is especially pertinent if the impact of a flood is not to be compounded by a lack of place-related insights from flooded residents.

Place-related meaning is likely to change following a flood. If planners pay attention to this, they may be less likely to face opposition to their plans and would be better placed to avoid suggesting adaptation options that go against how locals relate to their towns. Methods used to identify the geographical

spread of place meanings such as the use maps (Brown and Raymond, 2007) can help to build understanding of the location, variation and depth of place meanings, and this identifies significant areas that adaptation could have a significant impact on. The importance of place attachment and identity in recovery following a destructive event was demonstrated in Chamlee-Wright and Storr's (2009) study following Hurricane Katrina. In order for a full range of place-related meanings to be taken into account, it is important that enabling social and political structures are put in place so residents can contribute to the recovery process. It should be noted that the flooding in Cumbria was not as extensive or as destructive as flooding that has been experienced in other communities, such as in Queensland in 2010 and in New Orleans in 2005 – in Cumbria anchoring landmarks still exist and are recoverable.

It is important to note that disruptive events and unfolding interactions between people and place have the potential to be transformative (Cox and Perry, 2011). The research in this thesis suggests that, in some respects for residents in the flooded towns, relationship with place expanded and deepened following the flood events. From a well-being perspective, flooded residents were more likely to note the friendliness of people in their town following the flood event. The interviews in Keswick revealed that new and invigorated relationships increased feeling of connectedness. They also potentially increased residents' ability to adapt to further flood risks, as it is through this newly developed aspect of place that people receive information about hazards and practical help. The process of recovery and rebuilding may also contribute to a stronger place identity, if people are given a role in the recovery process. For Keswick respondents, as in Tuohy and Stephen's (2009) study, the flood offered an opportunity to demonstrate 'mastery' in the face of a challenging life event. It is important that planners pay attention to these narratives; where they are positive, they can be encouraged with targeted communication about risk, adaptive options and community involvement. Where they are negative or restrictive, they can perhaps be countered with focused efforts such as including disenfranchised residents in decisions

around place and cultivating social networks and capital. Although information campaigns can have mixed results, without them, efforts to engage at risk residents may be at risk of failing.

6.6 Summary

This chapter has brought together the findings from chapters 4 and 5, in conjunction with relevant literature, to address the research questions set out in chapter 1 and discuss the main findings of the research.

This study reveals that flooding affects relationships with place in a variety of ways dependent on experience and context. Place-related meaning changed for flooded residents: the focus shifted to a closer community. Flooding does not seem to have undermined the strength of attachment to the local area, but the meanings related to the local area have been changed by the floods. These findings are similar to Stedman's (2003) findings concerning attachment and meaning to Lakeshore areas, whilst meaning may change attachment levels may be unaltered. The findings generated in the in-depth interviews reflected how the experience of place in constructed at the individual level. This research was developed in line with qualitative and constructivist approaches to place and narratives (Burley et al., 2007, Carrol et al., 2009 and Chamlee-Wright and Storr, 2009) and provides an understanding of the mechanisms underpinning relationship with place that were explored using quantitative tools.

The one negative impact that flooding has had on residents' feelings about Cockermouth surrounded physical changes to the town: for flooded residents, physical changes to the town centre were less welcome than they were for non-flooded residents. This can be viewed as a resistance to place change at the local level at a time when place change at the household level has already introduced a level of uncertainty.

Flood risk management entails responsibility across a number of levels, from national and local government structures right down to individual householders. This study found that place attachment did not predict who residents felt should be accountable for flood risk management. If adaptation is to entail changes to local places, emotional attachment to place will not shape who residents feel should manage the changes even if it informs how they feel such changes should be managed. However, whilst place attachment may not explain how residents feel flood management responsibility should be assigned, it does, to varying degrees, indicate whether people are likely to get involved in flood management decisions about their local area.

In proactive adaptation to flood risk, place attachment is likely to be reflected in participation in planning decisions. But in reactive adaptation, the impact of flooding may mean that place attachment needs to be accompanied by other assets (social capital) and emotions (trust in council) for it to relate to involvement in planning decisions. These results build empirically on previous research connecting place and behaviour (See section 2.4.1), and suggest that in certain circumstances place attachment does directly relate to behaviour. The positivistic approaches to research questions 1 and 2 very much sit within environmental psychology investigation into how place attachment informs attitudes and behaviours (Brown and Perkins, 2003; Devine-Wright and Howes, 2010). This research considers both attitudes and behaviour, and reveals to some extent the limit of positivistic measures of place as a predictor of behaviour. As Lewicka (2005) sets out, enabling factors such as social capital may be needed to be included in analysis for place attachment to be reflected in behaviour. Recently, Mihaylov and Perkins (2013) also suggested the need for including measures such as social capital in research to get a greater picture of how place attachment interacts with other social variables. This research indicates the usefulness of a pluralist approach that also includes qualitative methods to understand how exactly it is that place attachment and other social measures inform each other.

These findings offer an insight into the ways relationship with place can either enable or constrain adaptation, highlighting the importance of understanding

place meaning, targeted engagement to either harness or counter narratives, the role of place attachment into the decision making process and continuity following a disruptive event.

Chapter 7: Conclusions

7.1 Introduction

This study focuses on the role of place attachment and place related meaning in proactive and reactive flood management processes. It is already established that a changing climate is going to entail modifications to place, both as a direct result of changing weather patterns and as a result of adaptation to the risks these changes entail (Devine-Wright, 2013). In the UK in particular, flood risk is set to increase as a changing climate will mean more unpredictable and severe weather events. In chapter two it's explained that place theory has only recently started to inform adaptation literature, following an expansion of research and policy to include social science in framing adaptation. Empirical evidence on the impact of climate change on place is limited, in particular the link between place attachment and planning processes around place change. This research begins to address these empirical gaps by considering how the process of place attachment interacts with flood risk, and the implications of this interaction for adaptation planning, as the three research questions encapsulate:

- Do relationships with place predict expected distribution of responsibility in proactive and reactive flood risk management?

- Do relationships with place predict participation, or planned participation, in adaptation decisions in proactive and reactive flood risk management planning processes?

- How does a flood event affect perceptions of place (at the house and town/village scale) for flooded and non-flooded households? (with a particular focus on older adults)

7.2 Main empirical findings

The findings from this study suggest that flooding affects people's sense of place in a number of ways. In chapter 5 the respondents discuss the beauty of the area surrounding Keswick; place attachment to the town and the wider countryside in particular was positive. When asked about changes in the town following the flood the discussion usually centres on interactions between community members, an increased connectedness and the influence of the social networks that are embedded in, and are part of, Keswick. The impacts on place related meaning following the floods unfolded differently at the house and town scale. Place attachment at town scale was relatively unchanged after the flood, other than increased familiarity between residents. The difference between flooded and non-flooded areas were implicitly reinforced in discussion, which may have contributed to feelings of being stuck in the flooded areas, but other aspects of town life have not become more salient or less attractive as a result of the floods. At the household level the results from this study support previous findings indicating that flooding strips feelings of security in homes (Carrol et al., 2009; Sims et al., 2009). Items that are strongly identified with are destroyed, there is a lack of control over removal of objects or of who crosses the threshold of house, and perceptions of being trapped, meant that flooded residents reflect negatively on how the floods had impacted household life. Interestingly, although perception of place at the household level did become negatively valenced for flooded residents, most framed flood risk and the flood event as one element of a larger narrative that included comparatively more difficult times. Familiarity with place, and autobiographical references linked to place, meant that the impact of specific floods could be rationalised as part of a larger

picture, reducing the psychological impact of the 2009 event. One resident had a particularly difficult experience and the floods could not be psychologically framed as an acceptable element of the life-course. Once a certain level of stress has been experienced, narratives do not enable a soothing reframing of the experience. Overall this research concurred with other empirical work that suggests narratives can have a positive effect in increasing adaptive capacity following disruptive events (Chamlee-Wright and Storr, 2011; Tuohy and Stephens, 2012). The results in Chapter 5 reflect a shift in place meaning in terms of increased salience of social connections, which contribute to an increased sense of place identity in Keswick, and also demonstrate the importance of narratives in perception of place and place disruption.

The results in Chapter 4 reflect an asymmetrical impact of floods on relationship with place at different scales. At the household scale, relationship with place for flooded residents had largely become negatively valenced; however for both flooded and non-flooded residents attachment to the town is positive. This likely reflects the different meanings people give to these two scales, houses are homes – places of respite and security, and flooding undermines and changes these meanings. At the town scale, meaning is more likely to relate to utility and socialising, which are not permanently undermined by the floods. However, importantly for flooded residents, physical changes to place in town (namely the addition of brightly coloured benches) were unwelcome, suggesting that when place meaning is shifting (negatively) at one scale, it is less welcome at other scales.

The results in Chapter 5 address the first and second research questions. These questions shift the focus to place related behaviour – does place attachment relate to expected distribution of flood management and is it associated with active involvement in planning decisions?   These two research questions address the political nature of place management as described in Riley's assertion that whilst place can be experienced cognitively and affectively 'landscape remains a social and political fact, designed, owned

and maintained by people [it is] an external landscape of broader implications' (1992:31). Place attachment is demonstrated in this study to be unrelated to an expectation for local councils or for residents to be responsible for flood management in the future. Being attached and identifying with one's local area is not associated with expected distribution of responsibility either in proactive or reactive planning. However, place attachment is directly associated with involvement in prospective flood risk planning. In reactive planning its impacts are more nuanced. For non-flooded residents, when the belief in flood risk is salient, place attachment is associated with involvement in planning decisions. For flooded residents, social capital and trust in local government needed to be present for them to feel empowered enough for place attachment to be reflected in town level adaptation plans.

Overall, these findings suggest that place is perceived differently after a flood event, and attachment to place plays a different role in involvement in planning decisions depending on whether the planning is proactive or reactive, and whether an individual has been directly or indirectly affected. As described in Chapter 2 (section 2.4.3), reactive and proactive planning draws on different resources. In terms of social processes related to place, proactive and reactive planning will likely be shaped differently by residents' relationship with place. Directly experiencing a flood means that place attachment is less likely to be related to contributions to adaptation decisions, social capital and trust in actors are needed for before place attachment manifests in behaviour. This provides empirical support for Mihaylov and Perkins' (2013) assertion that when environmental disruptions occur, if attachment is high but social capital is low people may simply accept place change, even if it has negative implications for well-being.

Ultimately, direct experience of a disruptive event reduces the strength of place attachment as a driver of behaviour. For those not directly affected, once flood risk is believed to be increasing, place attachment is associated with involvement in decisions. The data from Barnes offers an insight into

proactive planning, and it should be noted that a willingness to undertake behaviour may not translate into actual behaviour, but the results from this study area suggest that prospectively place attachment will be reflected in contribution to planning efforts.

7.3 Theoretical Implications

The impacts of floods on place-related meaning and place attachment

The findings from this research highlight the dynamism of place related meaning following environmental change. The delineation between place attachment as strength of relationship with place, and place as a locus of meaning has been explained in chapter 2 (section 2.2.2). The mixed methods used for this research revealed that flooding affected these two aspects of place differently. Strength of attachment to place was positive for both flooded and non-flooded residents, however place meaning was slightly different for the two groups and physical changes in the town following the floods were perceived differently. Changes in place meaning following a disruptive event are well noted (Brown and Perkins, 1992; Windsor and McVey, 2005; Miller and Rivera, 2007); however there are fewer studies researching both place attachment and meaning. The results here concur with Stedman's (2003) findings on place meaning versus place attachment and suggest that place attachment is not easily undermined by a change in place; people remain positively attached to their local area.

By examining place attachment and involvement in planning procedures in an area that has been impacted by flooding and one that has not, suggestions can be made about the effects of flooding experience. These suggestions are made mindful of the fact that such issues are contextual and more studies would be needed to discern whether the dynamics between variables are present in other similar planning situations. With these caveats in mind considering these results through an adaptation lens, the work in this thesis indicates that

understanding place meaning will be important in adaptation planning. The results in chapters 4 and 5 suggest that it is the interpretation of place change on place meaning that should be planners' focus rather than the objective change (Devine-Wright, 2009). Whilst attachment levels - captured by scales including items such as 'Cockermouth is special to me' - reflect the strength of attachment, and are useful in testing strength of relationship, they are somewhat limited in describing what respondents are attached to. These findings reiterate that to fully understand the impact environmental change has on individuals, efforts should be made for metrics to capture place meaning as well as strength of attachment, acknowledging that such instruments will not reflect the full depth of place meaning but will provide another layer of understanding.

Salience of place

This project was partly based on research suggesting that aspects of place can become more salient following a disruptive event (Speller et al., 2002; Burley el., 2007; Chamlee-Wright and Storr, 2009), which may make people active in decisions around place change. However, the results in this thesis do not support this premise. Place attachment was directly related to willingness to be involved in pro-active decisions in an area not affected by place change. Where flooding has occurred, place attachment does not directly relate to concerted efforts to influence decisions around reactive planning. In this instance enabling factors need to be present for place attachment to be associated with planning behaviour. These results correspond with other findings that suggest place attachment was only reflected in attitudes/behaviours when mediating variables are considered including trust in actors (Payton et al., 2005; Devine-Wright and Howes, 2010) and social capital (Dallago et al., 2009).

Flooding and relationship with place at different scales

This research highlights the differentiated effect the impact of floods has on

relationship with place at different scales, as discussed above (section 7.2). At the household level the impact of the floods appeared to have negatively valenced attachment to houses, supporting findings from previous research (Carrol et al., 2009, Sims et al., 2009; Walker et al., 2011). However, at the town level flooding does not appear to have had a similarly negative affect, most respondents characterised their towns positively. An interesting nuance was that flooded victims were more likely than non-flooded victims to resist physical change to the town centre – these finding corroborate other research regarding the desire for place continuity from residents following disruptive disasters (Kates et al., 2006). The importance of scale in determining the role of social processes in adaptation has been detailed before (Adger et al., 2005) and place attachment has already been demonstrated to vary depending on the scale of analysis (Hernando and Hidalgo 2007; Lewicka, 2010). This research confirms that scale is important in understanding how social processes unfold following a flood event, and that place attachment can be experienced differently depending on the scale of focus and these variations can have implications for well-being.

Place attachment and adaptation

The results from this research suggest that place attachment (strength of relationship) does not play a uniform role in involvement in adaptation decision making processes. This research tentatively contributes to the gap in the literature put forward by Manzo and Perkins (2006) that literature on place attachment does not often consider the socio-political context that planners operate in, and the community planning literature sometimes overlooks emotional connections to place. These results suggest that where place attachment is positive it is likely to lead to intentions for involvement in pro-active planning decisions. However, once an environmental stressor has been experienced, the link between place attachment and involvement in planning decisions is more nuanced. For those not flooded in their houses, flood risk needed to be salient in order for residents to participate in planning; however for those flooded at household level other factors, trust and social capital, play a role. These results suggest that in difficult times,

where environmental stressors are experienced, place attachment will not directly relate to involvement in the planning processes around place change for people who have already been directly affected. It appears that reaction to place change, perhaps stress or feelings of helplessness, mean that other variables that increase self-perceived agency and efficacy need to be present in vulnerable populations for place attachment to manifest in involvement in place management behaviour. Whilst certain aspects of place may become more salient for directly affected individuals it does not make them more likely to be involved in place management. Ultimately, place attachment will not be the only reason that people take part in decision making processes; however, the link between place attachment and well-being (see section 2.2.1) suggests that it will may have important implications for procedural and distributive justice aspects of planning processes as discussed in section 6.5.

7.4 Limitations of research

This research adds empirically and theoretically to place and adaptation literature however it does have limitations and areas that could have been usefully extended were the research to be undertaken again.

The main limitation of this study is that the comparison between the two areas is necessarily limited. Place research by its nature is highly contextual, additionally, reactive and proactive adaptation projects will be specific to their locales and will unfold according to local conditions (Smit and Wandel, 2006). However, the only way to directly compare proactive and reactive adaptation would be to carry out research in an area prior to and following an event, something extremely difficult to do. These two areas have been usefully compared to make suggestions about the role of place attachment in adaptation behaviour and as developed on in section 7.5. The TE2100 is unique in its foresight, and within this the Barnes area is most like a self-contained town with a high percentage of green space. The wider TE2100

project is a relatively unique example of pro active planning, and as such provides a significant case study for understanding processes around long-term pro active planning. The Cumbrian case study areas sit within a larger set of case studies on English flood management. Temporally, the Cumbrian case study allowed the consideration of place issues at a time when increasing responsibility is being assigned to individuals, providing useful results for planners and policy makers. The extent of the floods in Cockermouth and the consultation process underway at the time of the conception of this research meant it was an ideal location to study these issues, and nearby Keswick with its attraction as a retiree destination was a pertinent location to deal with how older adults deal with flood risk. These methods are able to be replicated elsewhere, and whilst the place meaning will inevitably vary I would expect underlying mechanism linking place attachment and behaviour/behavioural intentions to be the same.

The first research question focuses on the role that place attachment may have in expected distribution of responsibility. The question in the surveys that identified expected distribution of responsibility allowed respondents to strongly agree that all agencies listed should be involved. In hindsight, residents are likely to attribute responsibility to outside agencies in response to such a question. One method of refining the survey question on this issue would have been to ask residents to rank the various actors involved in flood management starting with the actors they expect to take most responsibility through to those they expect to take least responsibility. It would also be useful to include a question that asked what the balance of responsibility should be on a scale with residents at one end and government at the other.

In the surveys, attachment to one's house was inferred by the response to an open ended answer. On reflection, a quantitative measure of place attachment at the household scale would have been useful for direct comparisons with town level attachment and to test statistically for relationships with behaviour variables.

The older adults interviews provided useful insight into how place change was experienced and how floods may affect perception of place and perception of self in place. The typology generated from these interviews, and the processes linking place and experience of flood risk, builds on previous research. Whilst specifics around town life may not be replicated in other areas, the underlying mechanisms (such as the inoculation effect) can provide insight into how the wider older adult population may deal with flood risk. If time and resources had allowed, it would have been useful to increase the sample size and carry out similar interviews with individuals representing all of the age groups affected by the floods in Cumbria.

7.5 Policy implications

The results from this research have several implications for the management of flood risk, and recovery from a flood event. These relate to the importance of social capital; significance of place meaning; the importance of understanding and addressing narratives; the desire for continuity after a disaster; and a discrepancy between how place attachment relates to self-perceived responsibility and the division of responsibility encouraged in the new politics of localism.

Mihaylov and Perkins suggest that 'It is only through translating place attachments to social capital and collective action at the community level that the full benefits of attachments to cherished places and people are realized' (2013: 71). The results for the third research question corroborate their assertion. Social capital is important for involvement in planning (Selman, 2001; Pelling and High, 2005), and from a place perspective this is particularly true for people directly impacted by environmental hazards. Attention needs to be paid by planners to the frameworks in place to encourage involvement in decisions. If place attachment and place related meaning are to be taken seriously by planners, then concerted efforts will

need to be made to ensure that for individuals most affected by hazards there are channels through which they can more easily communicate their feelings and choices about place change.

Flooding did not seem to have negatively affected place attachment to local areas. Place meaning however, changed after the event. This would suggest that place attachment (strength of attachment) is quite resilient to place change. Place meaning however was different. For adaptation to climate change it will be important to understand how important place meanings are to people and how meanings will respond to place change (Devine-Wright, 2013) Essentially, man- made alterations to landscapes do not result in opposition in and off themselves. Understanding the importance of how change is interpreted will be important for civic groups and planners.

Linked to place interpretation is the role of narratives in adaption. Narratives act to filter information about risks (Skinner, 2000; Wolf et al., 2010). Information that jars with narratives can be ignored or dismissed as irrelevant, which is one of the reasons a greater understanding of the processes behind change interpretation is necessary. The Keswick respondents demonstrated the role of narratives in hazard interpretation, and the inoculative effect a life course narrative can have on the psychological impacts of flood events. As Tuohy and Stephens (2012) found, experience of flooding offered an opportunity to express mastery and agency; the findings of the inoculative effect in this thesis correspond with their findings. Previous general life experience and place related experience means that older adults reduce the psychological impacts of flooding by placing them within a longer, life narrative. As Tuohy and Stephens (2012) highlight, providing opportunities for adults to share their stories will bolster well-being following a disruptive event, working as a supportive strategy at a time of change.

Even though planners may be tempted to improve perceived weaknesses or flaws in previous town layouts, changes can be particularly unwelcome for directly affected residents at a time when uncertainty prevails. This reinforces Alexander's assertion that for more severe events 'the process of planning

reconstruction must necessarily take account of people's physical, emotional and economic attachment to place. This usually does not lead to the most efficient forms of reconstruction, but it does increase the chances of success compared to more radical solutions that attempt to sweep away the past but are likely to be rendered inoperable by public hostility' (2004:6). This research suggests that with reference to areas affected by flooding a conscious effort should be made to consult flooded residents about wider changes to local areas as it is more likely place change may have negative implications for a group of already vulnerable residents.

In the UK, the government is decentralizing flood risk management, with the onus of responsibility placed increasingly on local governing bodies and local residents. Concurrently, the Localism Act aims to shift power from central government to local people: 'The Government is committed to passing new powers and freedoms to town halls. We think that power should be exercised at the lowest practical level - close to the people who are affected by decisions, rather than distant from them. Local authorities can do their job best when they have genuine freedom to respond to what local people want, not what they are told to do by central government' (Department for Communities and Local Government, 2011:4).

This study suggests that place attachment does not entail an expectation for local councils or for local residents to take responsibility for flood risk management. Place attachment has been highlighted as a potential community asset to cultivate civic behaviour (Lewicka, 2011), and whilst this may be the case, my findings suggest that the cultivation of place attachment will not result in citizens shouldering the burden of responsibility or in an expectation for local councils to do so. However the results presented here suggest that if localism is a desired move, it will not be underpinned by place attachment – even if more people are attached to their area is does not affect who they expect to manage flood risk. The act goes on to state that it 'passes significant new rights direct to communities and individuals, making it easier for them to get things done and achieve their ambitions for the place where they live' (Department for Communities and Local Government, 2011:8). As

described in section 7.2, place attachment does not relate to an expectation that local residents should contribute to managing flood risk. If planners are interested in place attachment as an instrument of involvement, campaigns for involvement using narratives of responsibility and ownership may not be particularly useful.

7.6 Recommendations for future research

This research builds on the findings of previous place research and contributes empirical data to the adaptation and planning literature. Through the process of carrying out this research and as a result of the findings, three potential avenues of further research are suggested.

Firstly, place meanings and attachment are shaped by flood events. Meanings change, and the link between place attachment and behaviour alters. What would be particularly useful for researchers and planning practitioners would be to extend analysis to understand the relative importance of difference facets of place meaning, possibly using methods such as Q-methodology that enable qualitative data to be ranked.. In this way the depth as well as the breadth of place meaning could be captured and would be particularly relevant for planners when considering adaptation options that will significantly change landscapes.

Secondly, as highlighted before (Devine-Wright and Clayton, 2010), longitudinal studies on place attachment are limited. The results presented here reflect a static cross section of individual's relationship with place. However, place attachment is not static. Longitudinal research into adaptation planning would provide a greater understanding into possible evolutions in the strength of place attachment and how place related meanings may change as disruptive events are experienced and adaptation plans unfold. Such research would provide valuable insight into the processes involved in place attachment, and would also help with identifying how place attachment can be harnessed through involvement in place management.

Thirdly, the comparison between reactive and proactive place change is tentative here, as the results from the two study areas will not necessarily be generalizable. Further studies into pro-active and reactive adaptation planning processes would be needed to test whether the same relationships between the variables presented here exists elsewhere. Research on the link between place attachment and behaviour is ambiguous, reproduction of studies is needed to determine the consistency of place attachment as a driver of behaviour, and what variables are significant in mediating this relationship.

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Appendix 1: Interview consent form

Consent Form

My name is Tara Quinn and I am doing a PhD at the University of East Anglia, my research is focused on adaptation to flooding in the UK. The purpose of the study - being conducted in March 2011 - is to learn about the significance of the local area to Keswick residents and to learn about some of the impacts of the floods of November 2009.

Participation consists of one interview lasting approximately thirty minutes to one-hour. This interview will be audio taped, unless otherwise requested by the participant. This study poses little to no risk to is participants. I will do my best to ensure that confidentiality is maintained by not citing your actual name within the actual study. You made choose to the leave the study at any time, and may also request that any data collected from you not be used in the study.

A summary of the results will be available to participants upon request. Please contact interviewer Tara Quinn (T.quinn@uea.ac.uk) with any questions or concerns.

By signing below you agree that you have read and understood the above information, and would be interested in participating in this study. Thank you for your time.

_____

Signature of Interviewee

_____

Signature of Researcher

Date:

Appendix 2: Interview Protocol

Protocol for interviews with older adults in Keswick

Firstly I introduce myself and give the interviewee some details about my project and what the outcome will be of the fieldwork. I then explain the consent form and give the interviewee time to read through and sign before the interview starts. I answer any questions the interviewee may have about the research and the data.

The interviews are recorded.

1. Could you tell me what first brought you Keswick?

Probes: How long have you lived here? What specifically attracted you to the area?

2. If you were going to describe Keswick to someone who hasn't been here, how would you describe it?

Probes: Do you have any favourite parts of Keswick? What characteristics do you think Keswick has?

3. How did the floods affect the town?

Probes: Were any parts of town particularly affected? How did the floods affect your everyday life?

4. Have the floods affected how you feel about Keswick?

Probes: Has anything changed in the town as a result of the floods? What was it like to experience the floods?

5. What do you think of the new plans for the flood wall?

Probes: What do you think caused the floods? What do you think should be done to manage flood risk? Have you attended any of the meetings?

For interviewees whose houses were flooded

6. How did the floods affect your house?

Probes: Where did the flood waters reach? When did you evacuate? Have you been flooded here before

7. Does experiencing floods affect how you feel about your house?

Probes: Have you made changes since the flood? Have carried out any flood proofing?

Appendix 3: Surveys

Survey on flood risk management in the Barnes area

Hello, I am a researcher from the University of East Anglia. I am carrying out surveys to find out your views on your local area, particularly the riverside area and your opinions about potential flood management developments. I realise that you may not be aware of flood management planning in your area but I am still interested in your opinions about Barnes and potential flood management options.

I would appreciate if you would participate in this survey. Any information that you provide will be kept strictly confidential, will not be given to third parties and will only be reported in anonymous statistical form.

Please work through all the sections of the questionnaire, answering as much or as little as you want for each question. There are no right or wrong answers, what comes into your mind is most important. We are interested in your opinions, as ALL your views are relevant. It will take 15 minutes to fill it in.

If you have any queries or would like more information, please contact Tara Quinn by email at t.quinn@uea.ac.uk.

Please leave the completed questionnaire outside your door in the envelope provided.
One of our team will come and collect it tomorrow.

Q1. How long have you lived in Barnes?

Q2. If you were not born in Barnes, what attracted you to the area?

Q3. What three words or sentences would you use to describe Barnes? (positive or negative)
1.

2.

3.

Q4. Would you say that you actively use the river or riverside? If yes, how often do you use it and what activity do you undertake the most?

Q5. To what extent do you agree or disagree with the following statements about your local area and neighbourhood:
(Please circle your to indicate your answer)

	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
Barnes is very special to me	1	2	3	4	5
I imagine that living near the Thames is like living near any major river	1	2	3	4	5
This is a close knit neighbourhood	1	2	3	4	5
There isn't anywhere I could live that would provide everything that I have access to in my area.	1	2	3	4	5
I identify very strongly with Barnes	1	2	3	4	5
I trust my neighbours to look out for my property when I'm not around	1	2	3	4	5
Living in Barnes says a lot about who I am	1	2	3	4	5
I have a lot of fond memories of my time in Barnes	1	2	3	4	5
I identify strongly as being a Londoner	1	2	3	4	5
The Thames and the riverside are very special to me	1	2	3	4	5

Q6. To what extent do you agree or disagree with the following statements:
(Please circle to indicate your answer)

	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
I value the riverside for the attractive scenery, sights and sounds	1	2	3	4	5
I value the river and the riverside because of the recreational opportunities it offers.	1	2	3	4	5
I value the river and riverside because of the history it holds and the heritage it has	1	2	3	4	5
I value this river because it helps me feel better physically and mentally	1	2	3	4	5

The Environment Agency in their TE2100 project have suggested that in the next 25 years Richmond council, along with other West London councils will have to make changes to their flood management options Have you heard about this project?   Yes   No

Q7. How important do you feel the following issues should for the agencies involved in designing flood management strategies over the next 25 years?

	Very Important	Important	Neither	Unimportant	Not at all important
Cost of defences					
Impact of defences on how the local area looks					
Impact of defences on access to the river					
Impact of defences on ecology of the river					
Impact of defences on local house prices					
Ensuring that all residents are defended equally					
Ability of defences to reduce insurance premiums for local residents					

Q8a. To what extent do you believe local residents can influence decisions about flood management in Barnes?

Strong Influence	Fairly Strong influence	Moderate Influence	Weak influence	No influence

Q8b) Please explain your reasons for your answer to 8a)

_____

_____

_____

Q9. To what extent would you agree that you trust the following bodies to manage flood risk effectively in your area?

	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Richmond Council	1	2	3	4	5
National Government (e.g. DEFRA)	1	2	3	4	5
Environment Agency	1	2	3	4	5
The Mayor of London's office	1	2	3	4	5

Q10. To what extent do you agree or disagree that action to reduce the likelihood of household flooding over the next 25 years is the responsibility of the following groups?

	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Homeowners	1	2	3	4	5
Richmond Council	1	2	3	4	5
National Government (incl. DEFRA, DCLG)	1	2	3	4	5
Environment Agency	1	2	3	4	5

Q11. Have you been involved in any flood management processes/decisions regarding flood management in your area?

Yes   No

If your answer is no please skip to question 18

If yes, what type of action have you taken?

_____

_____

_____

Q12. Please indicate how willing you would be to undertake any of the following actions related to flood management if you were invited to do so.

	Very willing	Willing	Neither	Unwilling	Not at all willing
Sign a petition	1	2	3	4	5
Attend a meeting held by the Environment Agency	1	2	3	4	5
Join a flood action group	1	2	3	4	5
Contact a local councillor	1	2	3	4	5
Attend a meeting held by Richmond Council	1	2	3	4	5

Q13. Do you believe that with existing flood defences your residence is vulnerable to flooding?
Yes   No
Q14. Do you believe that climate change is likely to increase the risk of flooding in your area?

Yes   No

And now please tell us a little about yourself and your household

Q15. What is your gender?

   Male   Female

Q16. What is your age? (please tick as applicable)
- ☐ *18-24*
- ☐ *25-34*
- ☐ *35-44*
- ☐ *45-54*
- ☐ *55-64*
- ☐ *65-74*
- ☐ *75+*

Q17. What is your current status (please tick one):
- ☐ *Working full time (30+ hrs/week)*
- ☐ *Working part time (9-29 hrs/week)*
- ☐ *Unemployed – seeking work*
- ☐ *Unemployed – not seeking work*
- ☐ *Retired*
- ☐ *Looking after children / the house*
- ☐ *Disabled*
- ☐ *Student*
- ☐ *Other: please state: _____*

Q18. Please tell us of your main occupation:

_____

Q19. What is the highest educational or professional level qualification you have obtained (please tick one):
- ☐ *O- Level/ GCSE*
- ☐ *Vocational qualifications*
- ☐ *A- Level*
- ☐ *Bachelor degree or equivalent (e.g. NVQ 4)*
- ☐ *Masters / PhD or equivalent*

□ *Other*
□ *No formal qualifications*
□ *Still studying*

Q20. How many children under 16 live in this household (please tick):
□ *None*
□ *1*
□ *2*
□ *3*
□ *4 or more*
□ *Refused*

Q21. What is your tenure at this residence (please tick one)?
□ *Own*
□ *Part rent – part mortgage*
□ *Rent (including renting through housing benefit)*
□ *Live here rent free*
□ *Don't know*
□ *Refused*

Q22. How long have you lived in your current residence?

Q23. What is your nationality? Please state:

AQ24. And finally, please tell us what type of residence this is (tick one):

□ **House**
□ **Ground floor flat**
□ **Flat/house above ground floor level**

Thank you for taking the time to complete this survey

Survey on flood risk management in the Cockermouth area

Hello, I am a researcher from the University of East Anglia. I am carrying out surveys to find out your views on your local area, particularly the riverside area and your opinions about potential flood management developments. I realise that you may not be aware of flood management planning in your area but I am still interested in your opinions about Cockermouth and potential flood management options.

I would appreciate if you would participate in this survey. Any information that you provide will be kept strictly confidential, will not be given to third parties and will only be reported in anonymous statistical form.

Please work through all the sections of the questionnaire, answering as much or as little as you want for each question. There are no right or wrong answers, what comes into your mind is most important. We are interested in your opinions, as ALL your views are relevant. It will take 15 minutes to fill it in.

If you have any queries or would like more information, please contact Tara Quinn by email at t.quinn@uea.ac.uk.

Please leave the completed questionnaire outside your door in the envelope provided.
One of our team will come and collect it tomorrow.

Q1. How long have you lived in Cockermouth?

_____

_____

Q2. If you were not born in Cockermouth, what attracted you to the area?

_____

_____

Q3. What three words or sentences would you use to describe Cockermouth? (positive or negative)

1. _____

_____

2. _____

_____

3. _____

_____

Q4. Would you say that you actively use the river or riverside? If yes, how often do you use it and what activity do you undertake the most?

_____

_____

_____

Q5. To what extent do you agree or disagree with the following statements about your local area and neighbourhood:
(Please circle your to indicate your answer)

	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
Cockermouth is very special to me	1	2	3	4	5
I have a lot of fond memories of my time in Cockermouth	1	2	3	4	5
This is a close knit neighbourhood	1	2	3	4	5
There isn't anywhere I could live that would provide everything that I have access to in my area.	1	2	3	4	5
I identify very strongly with Cockermouth	1	2	3	4	5
I trust my neighbours to look out for my property when I'm not around	1	2	3	4	5
Living in Cockermouth says a lot about who I am	1	2	3	4	5
I imagine that living near to the Cocker and the Derwent is like living near any other rivers	1	2	3	4	5

Q6a) Was your house flooded in November 2009?
Yes   No

Q6b) Has your house been flooded prior to November 2009?
Yes   No

Q7. To what extent do you agree or disagree with the following statements:
(Please circle to indicate your answer)

	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
I value the riverside for the attractive scenery, sights and sounds	1	2	3	4	5
I value the river because it helps me feel better physically and mentally	1	2	3	4	5
I value the river and riverside because of the recreational opportunities it offers	1	2	3	4	5
I value the river and riverside because of the history it holds and the heritage it has	1	2	3	4	5

Q8. Has how you feel about your house changed since the flood in 2009?

Yes   No

If your answer was yes, please describe how your feelings about your house have changed.

_____

_____

_____

Q9. Has how you feel about Cockermouth changed since the flood of

2009? _____

_____

_____

The Environment Agency has proposed changes to improve flood protection in Cockermouth.
Have you heard about this project?   Yes   No

Q10. How important do you feel the following issues should be for the agencies involved in designing flood management strategies over the next 25 years?

	Very Important	Important	Neither	Unimportant	Not at all important
Cost of defences					
Impact of defences on how the local area looks					
Impact of defences on access to the river					
Impact of defences on ecology of the river					
Impact of defences on local house prices					
Ensuring that all residents are defended equally					
Ability of defences to reduce insurance premiums for local residents					

Q11. What do you think of the changes to flood management proposed by the Enivronment Agency?

_____

_____

_____

**Q12a. To what extent do you believe local residents can influence decisions
about flood management in Cockermouth?**

Strong Influence	Fairly Strong influence	Moderate Influence	Weak influence	No influence

Q12b) Please explain your reasons for your answer to 12a)

_____

_____

_____

**Q13. To what extent would you agree that you trust the following bodies
to manage flood risk effectively in your area?**

	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Cumbria Council	1	2	3	4	5
National Government (e.g. DEFRA)	1	2	3	4	5
Environment Agency	1	2	3	4	5
Allerdale Council	1	2	3	4	5

Q14. Have your insurance premiums changed since the flooding in
November 2009? If yes, in what way?

_____

_____

Q15. To what extent do you agree or disagree that action to reduce the likelihood of household flooding over the next 25 years is the responsibility of the following groups?

	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Homeowners	1	2	3	4	5
Allerdale Council	1	2	3	4	5
National Government (incl. DEFRA, DCLG)	1	2	3	4	5
Environment Agency	1	2	3	4	5
Cumbria Council	1	2	3	4	5

Q16. Have you been involved in any flood management processes/decisions regarding flood management in your area?

Signed a petition	
Attended a meeting held by the Environmental Agency	
Joined a flood action group	
Contacted a local councilor	
Attended a meeting held by the council	
Other (please state)	

Q17. Do you believe that with existing flood defences your residence is vulnerable to flooding?
Yes   No

Q18. Do you believe the proposed defences will prevent flooding in your residence?
Yes   No

Q19. Do you believe that climate change is likely to increase the risk of flooding in your area?
Yes   No

Q20. Have you undertaken any work on your house to tackle the risk of flooding?
Yes   No

If your answer is yes, please explain what type of action you have taken. If your answer was no, is this because you do not feel that your house is at risk of flooding or is it for other reasons?

_____

_____

_____

And now please tell us a little about yourself and your household

Q15. What is your gender?

       Male   Female

Q16. What is your age? (please tick as applicable)
- ☐ *18-24*
- ☐ *25-34*
- ☐ *35-44*
- ☐ *45-54*
- ☐ *55-64*
- ☐ *65-74*
- ☐ *75+*

Q17. What is your current status (please tick one):
- ☐ *Working full time (30+ hrs/week)*
- ☐ *Working part time (9-29 hrs/week)*
- ☐ *Unemployed – seeking work*
- ☐ *Unemployed – not seeking work*
- ☐ *Retired*
- ☐ *Looking after children / the house*
- ☐ *Disabled*
- ☐ *Student*
- ☐ *Other: please state: _____*

Q18. Please tell us of your main occupation:

_____

Q19. What is the highest educational or professional level qualification you have obtained (please tick one):
- ☐ *O- Level/ GCSE*
- ☐ *Vocational qualifications*
- ☐ *A- Level*
- ☐ *Bachelor degree or equivalent (e.g. NVQ 4)*
- ☐ *Masters / PhD or equivalent*

- □ *Other*
- □ *No formal qualifications*
- □ *Still studying*

Q20. How many children under 16 live in this household (please tick):

- □ *None*
- □ *1*
- □ *2*
- □ *3*
- □ *4 or more*
- □ *Refused*

Q21. What is your tenure at this residence (please tick one)?

- □ *Own*
- □ *Part rent – part mortgage*
- □ *Rent (including renting through housing benefit)*
- □ *Live here rent free*
- □ *Don't know*
- □ *Refused*

Q22. How long have you lived in your current residence?

_____

Q23. What is your nationality? Please state:

_____

AQ24. And finally, please tell us what type of residence this is (tick one):

- □ **House**
- □ **Ground floor flat**
- □ **Flat/house above ground floor level**

Thank you for taking the time to complete this survey

Appendix 4: Codes for open ended answers in surveys

Coding for open ended answers in surveys

Codes for Question 2: If you were not born here, what attracted you to the area?

		Frequency	Percent	Valid Percent	Cumulative Percent
Barnes					
Valid	Work	4	2.0	2.5	2.5
	Born here	8	4.0	4.9	7.4
	Schools	15	7.5	9.2	16.6
	Needed to move	10	5.0	6.1	22.7
	Local/ lived here before	9	4.5	5.5	28.2
	Family/ Spouse	23	11.6	14.1	42.3
	Walking/ Green space	19	9.5	11.7	54.0
	Nice town/ Pleasant	39	19.6	23.9	77.9
	Housing type	5	2.5	3.1	81.0
	Location relative to London	15	7.5	9.2	90.2
	River	16	8.0	9.8	100.0
	Total	163	81.9	100.0	
Missing	System	36	18.1		
Total		199	100.0		

Cockermouth Flooded		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Work	9	11.4	16.1	16.1
	Born Here	2	2.5	3.6	19.6
	Local/Lived here before	12	15.2	21.4	41.1
	Family/Spouse	14	17.7	25.0	66.1
	Walking/Hills/Green Space	7	8.9	12.5	78.6
	Visited and liked it	2	2.5	3.6	82.1
	Nice town/ Pleasant area	5	6.3	8.9	91.1
	Housing type	5	6.3	8.9	100.0
	Total	56	70.9	100.0	
Missing	System	23	29.1		
Total		79	100.0		

		Frequency	Percent	Valid Percent	Cumulative Percent
	Cockermouth Non-flooded				
Valid	Work	20	19.8	23.3	23.3
	Born Here	6	5.9	7.0	30.2
	Schools	3	3.0	3.5	33.7
	Needed to move	1	1.0	1.2	34.9
	Local/Lived there before	16	15.8	18.6	53.5
	Family/Spouse	23	22.8	26.7	80.2
	Walking/Hills/Green Space	4	4.0	4.7	84.9
	Visited and liked it	3	3.0	3.5	88.4
	Nice town/ pleasant area	6	5.9	7.0	95.3
	Housing type	4	4.0	4.7	100.0
	Total	86	85.1	100.0	
Missing	System	15	14.9		
Total		101	100.0		

Codes for Question 3 word association task: What three words/sentences would you used to describe Barnes/Cockermouth

		Frequency	Percent	Valid Percent	Cumulative Percent
		Barnes			
Valid		2	1.0	1.0	1.0
	Strong community	8	4.0	4.0	5.0
	Village feel	43	21.6	21.6	26.6
	Beautiful	6	3.0	3.0	29.6
	Changing for the worse	3	1.5	1.5	31.2
	Friendly	5	2.5	2.5	33.7
	Good facilities	5	2.5	2.5	36.2
	Country feel	3	1.5	1.5	37.7
	Not diverse	4	2.0	2.0	39.7
	An island	3	1.5	1.5	41.2
	Green space	32	16.1	16.1	57.3
	River	8	4.0	4.0	61.3
	Quiet	28	14.1	14.1	75.4
	Accessibility	15	7.5	7.5	82.9
	Middle class	4	2.0	2.0	84.9
	Different	3	1.5	1.5	86.4
	Traffic	2	1.0	1.0	87.4
	Neighbourly	1	.5	.5	87.9
	Pleasant/Lovely	18	9.0	9.0	97.0
	Safe	6	3.0	3.0	100.0
	Total	199	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
	Cockermouth Flooded				
Valid	Relaxed	1	1.3	1.3	1.3
	Friendly	17	21.5	21.8	23.1
	Quiet	3	3.8	3.8	26.9
	Pleasant/nice	17	21.5	21.8	48.7
	Independent	1	1.3	1.3	50.0
	Gem town	4	5.1	5.1	55.1
	Expensive	1	1.3	1.3	56.4
	Busy	3	3.8	3.8	60.3
	Strong community	6	7.6	7.7	67.9
	Small town (-ve)	1	1.3	1.3	69.2
	Small town (+ve)	2	2.5	2.6	71.8
	Convenient	1	1.3	1.3	73.1
	Beautiful	4	5.1	5.1	78.2
	Changing for worse	2	2.5	2.6	80.8
	Home town	4	5.1	5.1	85.9
	Small market town	7	8.9	9.0	94.9
	Full of old people	1	1.3	1.3	96.2
	Good facilities	2	2.5	2.6	98.7
	Mixed	1	1.3	1.3	100.0
	Total	78	98.7	100.0	
Missing	System	1	1.3		
Total		79	100.0		

		Frequency	Percent	Valid Percent	Cumulative Percent
Cockermouth Non-Flooded					
Valid	Relaxed	1	1.0	1.0	1.0
	Friendly	11	10.9	11.0	12.0
	Quiet	8	7.9	8.0	20.0
	Neighbourly	1	1.0	1.0	21.0
	Pleasant/lovely	19	18.8	19.0	40.0
	Old fashioned	3	3.0	3.0	43.0
	Independent	3	3.0	3.0	46.0
	Safe	4	4.0	4.0	50.0
	Gem town	8	7.9	8.0	58.0
	Indifferent	1	1.0	1.0	59.0
	Busy	4	4.0	4.0	63.0
	Strong community	6	5.9	6.0	69.0
	Small town (-ve)	1	1.0	1.0	70.0
	Small town (+ve)	2	2.0	2.0	72.0
	Convenient	1	1.0	1.0	73.0
	Architecture	1	1.0	1.0	74.0
	Beautiful	5	5.0	5.0	79.0
	Changing for worse	1	1.0	1.0	80.0
	Home town	6	5.9	6.0	86.0
	Small market town	13	12.9	13.0	99.0
	Good facilities	1	1.0	1.0	100.0
	Total	100	99.0	100.0	
Missing	System	1	1.0		

Codes for Question 9b-:Did the floods affect how you feel about Cockermouth? If so, please describe how?

		Frequency	Percent	Valid Percent	Cumulative Percent
	Cockermouth Non-Flooded				
Valid	Renewed appreciation of town	3	3.0	3.7	3.7
	Bridges	2	2.0	2.4	6.1
	Changed for the negative	3	3.0	3.7	9.8
	Brought people closer together	20	19.8	24.4	34.1
	Back to what it was	10	9.9	12.2	46.3
	Improved aesthetics	16	15.8	31.7	65.9
	Rebuilt	5	5.0	6.1	72.0
	Worried it will happen again	2	2.0	2.4	74.4
	Empty shops	1	1.0	1.2	75.6
	Businesses are quiet	4	4.0	4.9	80.5
	More aware of flood risk area	1	1.0	1.2	81.7
	People are protective	2	2.0	2.4	84.1
	Haven't recovered	1	1.0	1.2	85.4
	Shops vacant	1	1.0	1.2	86.6
	Less personal	1	1.0	1.2	100.0
	Total	82	81.2	100.0	
Missing	System	19	18.8		
Total		101	100.0		

		Flooded			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Renewed appreciation of town	4	5.1	8.5	8.5
	Change for the negative	6	7.6	12.8	21.3
	Brought people closer together	15	19.0	31.9	53.2
	Back to what it was	2	2.5	4.3	57.4
	Improved aesthetics	4	5.1	8.5	66.0
	Rebuilt	1	1.3	2.1	68.1
	Worried it may happen again	3	3.8	6.4	74.5
	Empty shops	1	1.3	2.1	76.6
	Businesses are quieter	1	1.3	2.1	78.7
	Hasn't recovered	1	1.3	2.1	80.9
	Shops vacant	3	3.8	6.4	87.2
	Not the same	6	7.6	12.8	100.0
	Total	47	59.5	100.0	
Missing	System	32	40.5		
Total		79	100.0		

Codings for Question 12a) for flooded residents in Cockermouth. Did the floods affect how you feel about your house? If so, how?

		Frequency	Percent	Valid Percent	Cumulative Percent
	Cockermouth Flooded				
	Unsafe	6	7.6	13.6	13.6
	Aware of rain	2	2.5	4.5	18.2
	More precious	12	15.2	27.3	45.5
	Want to move	5	6.3	11.4	56.8
	More aware of river	2	2.5	4.5	61.4
	Changed living arrangement	1	1.3	2.3	63.6
	No longer home	10	12.7	22.7	86.4
	Back to same	4	5.1	9.1	95.5
	Hard to sell	2	2.5	4.5	100.0
	Total	44	55.7	100.0	
Missing	System	35	44.3		
Total		79	100.0		