

EXAMINING DIVERSE UNDERSTANDINGS OF SOCIAL
JUSTICE IN PLANNING FOR SEA LEVEL RISE:
A CASE STUDY OF LAKE MACQUARIE, NSW

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Lake Macquarie, Source: Pitsas (2007)

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Thesis submitted in partial fulfillment of the requirements for the degree of
Master of Research on Monday 9 October 2017

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List of Acronyms and Abbreviations

ABS	Australian Bureau of Statistics
AHD	Australian Height Datum
AU	Australia
BSC	Byron Shire Council
CoA	Commonwealth of Australia
CMP	Coastal Management Program
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCC	Department of Climate Change, Australian Government
DCCEE	Department of Climate Change and Energy Efficiency, Australian Government
DECCW	Department of Environment Climate Change and Water, New South Wales
DEE	Department of Environment and Energy, Australian Government
DPE	Department of Planning and Environment, New South Wales
EDO	Environmental Defenders Office
ESC	Eurobodalla Shire Council
GCC	Gosford City Council
IPCC	Intergovernmental Panel on Climate Change
LAP	Local Adaptation Plan
LGA	Local Government Area
LG NSW	Local Government New South Wales
LMCC	Lake Macquarie City Council
NCCARF	National Climate Change Adaptation Research Facility
NSW	New South Wales
NZ	New Zealand

List of Acronyms and Abbreviations (cont.)

OEH	Office of Environment and Heritage, New South Wales
SCC	Shoalhaven City Council
SEIFA	Socio-economic Indexes for Areas
SLR	sea level rise
TLPC	The Legendary Pacific Coast
UNFCCC	United Nations Framework Convention on Climate Change

Abstract

How can planning for sea level rise and the option of planned retreat be undertaken in a socially just way? This research applied a social justice framework to examine planning for sea level rise in the densely populated Lake Macquarie area. The Lake Macquarie area has the highest number of dwellings vulnerable to sea level rise in NSW and local adaptation planning for sea level rise is already being undertaken. An in-depth case study was developed through document and media analysis, observations of a community planning workshop, and interviews with key informants and householders. Interviews included local and state government, community stakeholders, and people living in low-lying coastal areas which are likely to be affected by sea level rise, as well as those living in more elevated areas around Lake Macquarie. This qualitative data was analysed thematically through a social justice lens incorporating procedural and distributive justice concerns to identify: the range of understandings of what is just in planning for sea level rise; and key factors that influence perceptions of justice in planned retreat scenarios. The study concludes that there is a need for guiding principles to explicitly address social justice, these are: responsibility; beneficiary pays; redistribution and intergenerational equity.

Author's Statement

This work has not been submitted for a higher degree to any other university or institution. The thesis is my work and sources of information have been appropriately recognised or were obtained through interviews during the course of my candidature. Macquarie University Human Ethics Committee approval was obtained, ethics reference number 5201700096.

Signed: 

Date: 9 October 2017

Acknowledgements

I'd like to thank my supervisor Dr Fiona Miller for her valuable advice and encouragement, and her genuine enthusiasm for this topic area.

Also for their amazing encouragement and support, I'd like to thank my husband, Andrew, and children, Alice and Hugo; and my parents, Laurie and Jane, for helping us when extra hands were needed.

Thanks to my interview participants, who gave up their time and thoughtfully considered and responded to my questions, sharing their appreciation for the Lake Macquarie area.

Chapter 1 Introduction: planning for sea level rise in the Australian context

As the science on the coastal impacts of climate change gets stronger, the protections for Australia's coastal communities are getting weaker...Along the eastern seaboard of Australia, where most of us live, state governments are relaxing their policies and largely leaving it to local councils to decide if homes can be built in low-lying areas. (Norman, 2013)

1.1 CLIMATE CHANGE RISKS AND COASTAL SETTLEMENTS

Projected climate change will exacerbate current risks and create new risks for Australia's coast. Storm surges, and inundation and flooding due to rising sea levels combined with extreme events will damage coastal infrastructure and low-lying ecosystems (Reisinger *et al.*, 2014). The physical impacts of sea level rise (SLR), flooding, cliff instability and beach erosion, will be at their worst during extreme events such as high tides and storm surges (DCC, 2009; Legresy, 2011). Flooding will impact fragile ecosystems, such as estuaries, rivers, lakes and lagoons (DEE, 2017). Over 86% of Australia's population live by the coast and population growth in coastal areas is already putting pressure on the environment (Norman, 2010). There is a concentration of economic assets on the coast. Large numbers of residential and commercial assets, and key services are at risk; a SLR of 1.1m would directly affect up to 274,000 residential and 8,600 commercial buildings nationally (DCC, 2009; DCCEE, 2011). Queensland and New South Wales have the most residential buildings exposed to SLR with between 44,000 and 68,000 at risk in each state if sea levels rise 1.1m (DCCEE, 2011). Coastal ecosystems such as mangroves and saltmarsh are projected to retreat landward, although this may be constrained by the built environment, and damage to ecosystems will reduce the protective buffer they provide for infrastructure and will affect tourism (Reisinger *et al.*, 2014). Risks from SLR will continue to increase beyond 2100 even if temperatures are stabilised (Reisinger *et al.*, 2014). Sea level rise will be a growing and ongoing challenge faced by coastal settlements and its impacts will be distributed unevenly in spatial and social terms.

1.2 POLICY AND PLANNING FOR SEA LEVEL RISE

The development and implementation of climate change adaptation and SLR policy in Australia is largely devolved to local governments, State governments and Natural Resource Management Bodies (Reisinger *et al.*, 2014). The Federal government has developed the *National Climate Resilience and Adaptation Strategy* which outlines a very broad set of principles to guide effective

adaptation practice, such as shared responsibility and factoring climate risks into decision making (CoA, 2015). However, it does not identify any clear responsibilities for adaptation action. Additionally, the Federal government provides scientific data and technical information and support for pilot projects (Reisinger *et al.*, 2014), including two major coastal assessments *Climate Change Risks to Australia's Coast: A First Pass National Assessment* (DCC, 2009) and *Climate Change Risks to Coastal Buildings and Infrastructure: A Supplement to the First Pass National Assessment* (DCCEE, 2011). Overall, the Federal government approach to adaptation has been ad hoc and under-resourced, shaped by the domination of National climate politics by economic rather than scientific considerations (Christoff, 2013).

At the State level responding to SLR is primarily undertaken through the land use planning system, and each state and territory has its own system, resulting in little consistency in the approach to considering coastal climate change risks in land-use decision making across Australia (Baker & McKenzie, 2011; Gibbs and Hill, 2011). In addition, SLR and other coastal climate risks are a factor in coastal management and flood risk management, which are dealt with under different legislative frameworks (Gibbs and Hill, 2011). State SLR planning benchmarks set a consistent approach to considering SLR in land-use planning, and Western Australia, South Australia, and Victoria have mandatory SLR planning benchmarks for 2100, however benchmarks in New South Wales and Queensland have been repealed (Reisinger *et al.*, 2014).

In NSW the 2009 *Sea Level Rise Policy Statement* and the 2010 *Coastal Planning Guideline* set a planning benchmark of a 0.9m rise in sea levels by 2100 above 1990 levels (Department of Planning, 2010). In 2012, the *Sea Level Rise Policy* was repealed on the basis that coastal councils needed the flexibility to determine projections to suit local conditions (NSW OEH, no date). However, the need for local SLR projections is not clearly justified, as discussed in Chapter Four. Currently, Stage 2 of the NSW Government's Coastal Reforms are underway, the Department of Planning and Environment (DPE) along with the Office of Environment and Heritage (OEH) is developing a new coastal management framework including the *Coastal Management Act 2016* (replacing the Coastal Protection Act 1979) and the *Coastal Management State Environmental Planning Policy* (NSW DPE, 2017). The *Coastal Management Act* recognises the local and regional dynamic nature of the coast and establishes clearer requirements for councils to consult with neighbouring councils, other public authorities and the wider community in developing and implementing coastal management strategies (NSW OEH, 2017). The *Coastal Management Manual* will guide what actions are included in councils Coastal Management Program (CMP), which may include studies for hazard identification, risk assessment, and management response evaluation including cost benefit analysis (NSW OEH, 2017). Coastal planning in NSW is moving towards achieving more local flexibility, whilst placing greater demands on councils to consult widely and conduct detailed analyses.

In the absence of the NSW Government’s SLR benchmarks local councils have adopted a variety of benchmarks, as illustrated in Table 1. This has resulted in an inconsistent approach along the coast and some councils relying on scientifically questionable reports instead of Intergovernmental Panel on Climate Change (IPCC) projections (EDO NSW, 2016). Many local governments lack the resources for hazard mapping and policy design (Reisinger *et al.*, 2014). However, there is a growing number of examples of local government plans and policies addressing SLR, for example Byron Shire Council’s *Climate Change Strategic Planning Policy* (BSC, 2009) and Lake Macquarie City Council’s *Marks Point and Belmont South Local Adaptation Plan* (LMCC, 2016d).

Table 1 A sample of local council sea level rise planning benchmarks

Council	Benchmark Adopted	2050	2100
Shoalhaven City Council	10 February 2015	0.23m	0.35m
Lake Macquarie City Council	23 July 2012	0.4m	0.9m
Byron Shire Council	12 November 2009	0.4m	0.9m
Eurobodalla Shire Council	25 November 2014	0.23m	0.72m
Gosford City Council	10 March 2015	0.2m	0.74m

Source: BSC (2009); ESC (2015); LMCC (2016c); GCC (2017); SCC (2017)

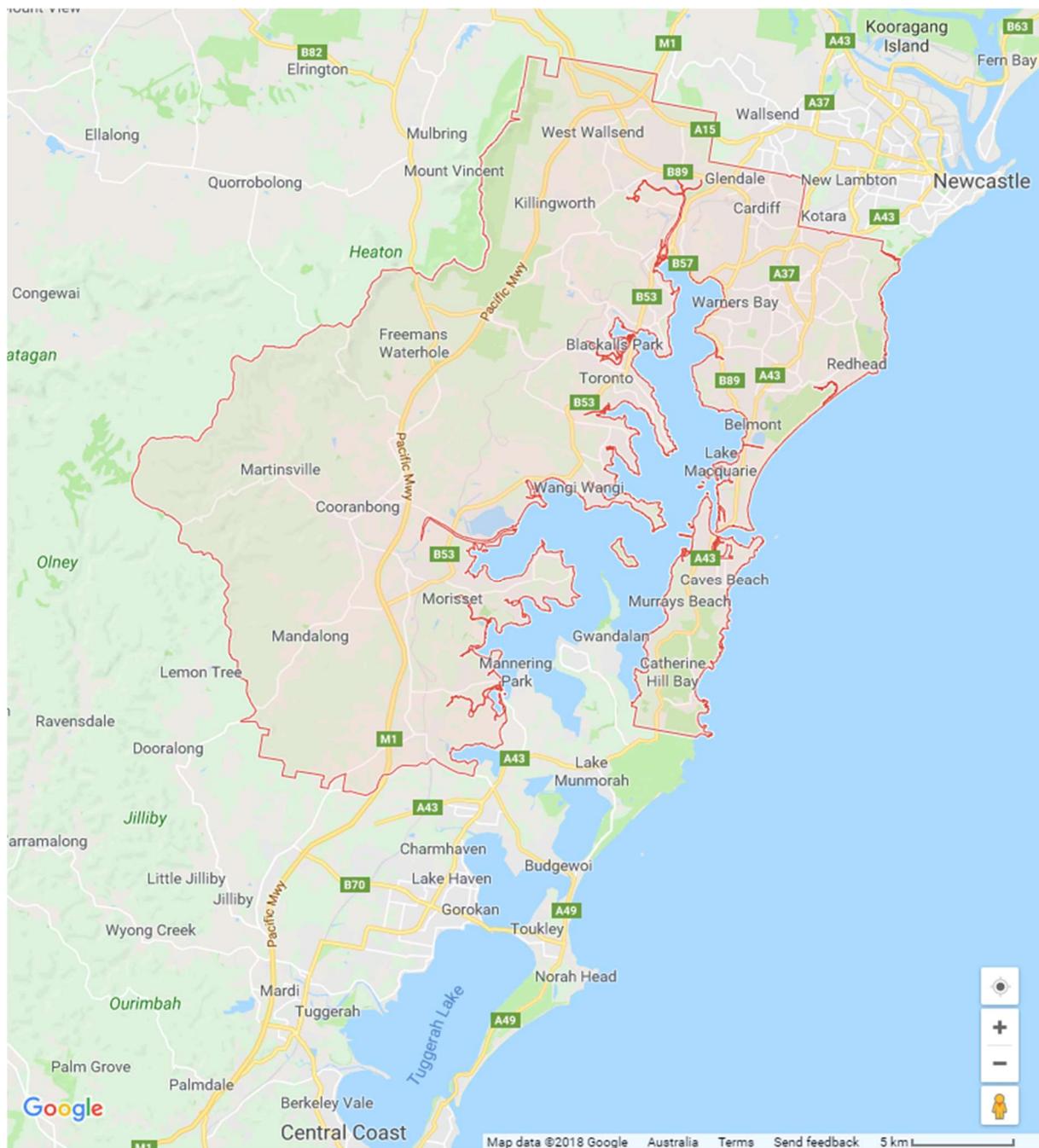
Whilst the Australian Government has focused on gathering the required technical information and some state governments have set SLR planning benchmarks, it is evident that the bulk of the responsibility to prepare for SLR has been devolved to local governments. Therefore, local scale planning is the focus of this research.

1.3 A SETTLEMENT AT RISK: LAKE MACQUARIE

1.3.1 The physical and community context

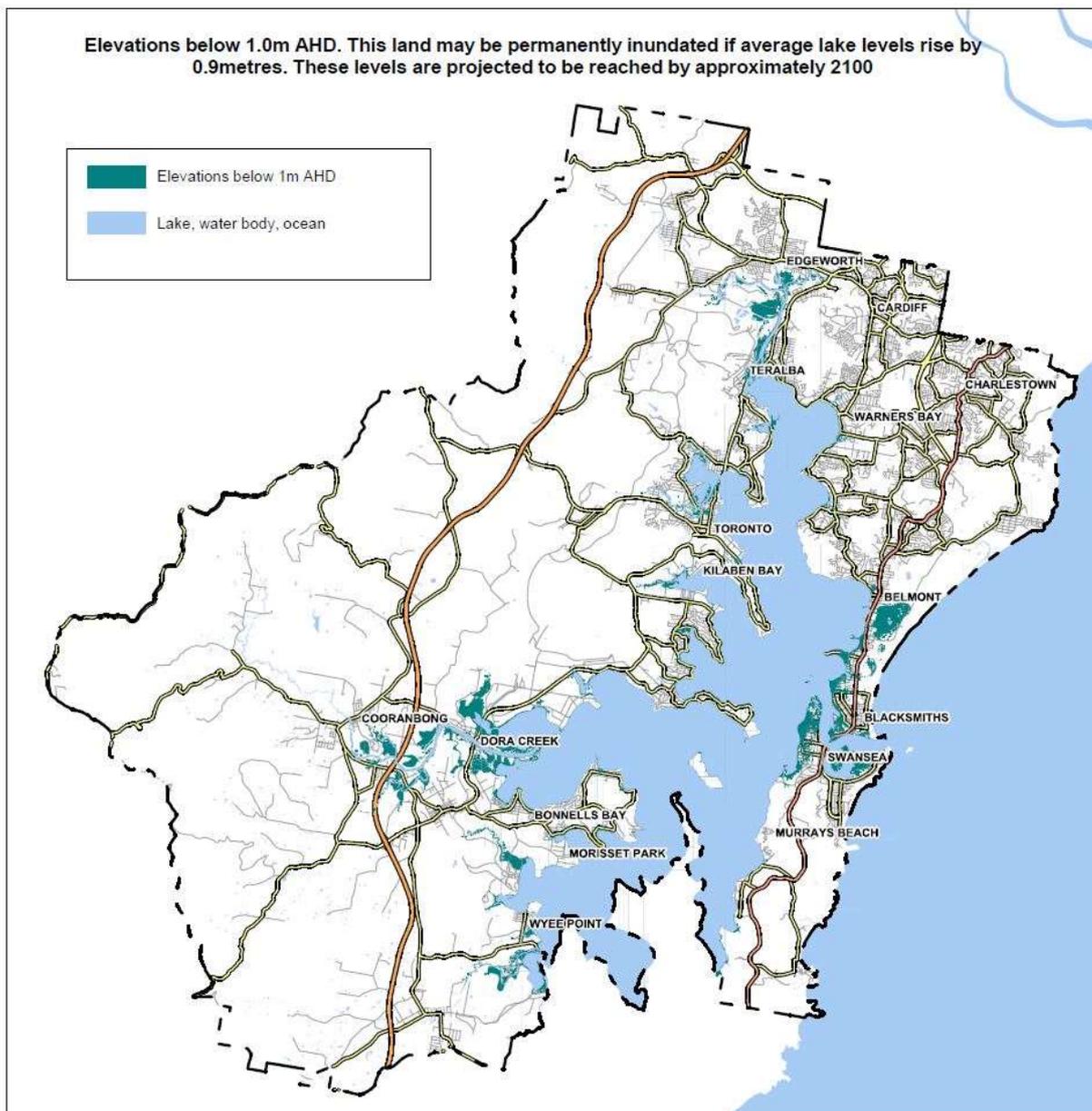
Sea level rise is a global phenomenon that will be felt acutely and differentially at local scales. Lake Macquarie City Council (LMCC) has been identified as one of the local government areas with the highest number of residential properties at risk from SLR in NSW (DCC, 2009). There are 7,500 low-lying properties at risk from inundation caused by future SLR (LMCC, 2016b). The area is a mix of densely populated older suburbs, small townships and scattered semi-rural communities (LMCC, 2016g). Lake Macquarie is located 150km north of Sydney and less than 10km south of Newcastle, see Figure 1. The Lake Macquarie waterway is the largest coastal lake in eastern Australia, and to the east of the lake lies 32km of coastline and to the west the forested Watagan Mountains (LMCC, 2016g). The water level in the lake is typically at 0.1m Australian Height Datum (AHD), however, intense rainfall over the catchment combined with elevated ocean levels can raise the water level in

less than 24 hours causing significant flooding of the foreshore areas and hardship to the community (Wongpaibool and Dewar, 2012). See Figure 2 which shows the impact of SLR of 0.9m to lake levels.



Source: Google_Maps (2018)

Figure 1 Lake Macquarie Local Government Area, NSW



Source: (LMCC, 2016h)

Figure 2 Land which may be permanently inundated if average lake levels rise by 0.9m

LMCC is the third most populous regional city in NSW, with a population of 202,847 (LMCC, 2016g) and over 1 million tourists visit the area each year (ABS, 2011). The median household income of Lake Macquarie residents is lower than both the NSW and Australian median, which is likely to be a factor of lower rates of full-time workers and a higher proportion of workers in the trades and services industries (LMCC, 2009). Lake Macquarie residents have slightly higher levels of socio-economic disadvantage compared with the rest of NSW and Australia. The Socio-economic Indexes for Areas (SEIFA) score provides a comparative measure of socio-economic circumstances for different areas, the average SEIFA score is 1,000 (LMCC, 2009). The SEIFA ranking for LMCC is 369 out of 564 LGAs across Australia, with the most disadvantaged LGA at the first ranking (ABS, 2011). The

LMCC SEIFA is 995 and suburbs across the local government area (LGA) range from 663 (Windale) to 1123 (New Lambton Heights) (ABS, 2011), which highlights that some suburbs are particularly disadvantaged. Those suburbs that are likely to be most affected by sea level rise range from 902 to 1092, however, as noted by Mcmanus, Shrestha and Yoo (2014) the waterfront areas near both the lake and the coast have attracted residents with higher incomes, whereas residents of other low-lying suburbs have lower incomes. The population is somewhat diverse, with:

- The proportion of people over 65 years (19%) is higher than the NSW average;
- The most populous age group is 45-54 years;
- 2.85% of people are Aboriginal and Torres Straight Islanders (5,594 people), which is higher than the NSW average; and
- 7,149 speak a language other than English at home; and
- 11,572 people have a need for assistance for a core activity (ABS, 2011).

Dwellings are predominantly separate houses, see Figure 3, and compared to the NSW average there are much fewer flats and units in the area. The tenure of occupied dwellings shows more people own or are buying their own homes (74%) than the NSW average (ABS, 2011). Lake Macquarie is typical of many coastal settlements with its densely settled, older style suburbs and the high proportion of retirees.



Figure 3 Mix of housing in Lake Macquarie suburbs

1.3.2 Local plans for sea level rise

LMCC commenced planning for SLR as early as 2008, when it developed the *Lake Macquarie Sea level Rise Preparedness Adaptation Policy* which stated the Council's commitment to identifying and responding to hazards associated with SLR (Mcmanus, Shrestha and Yoo, 2014). Table 2 outlines the key local policies, plans and planning controls that currently recognise measures to adapt to rising sea levels.

Table 2 Lake Macquarie City Council policies and plans addressing sea level rise

Local Policy and Plans	Details
<i>Waterway Flooding and Tidal Inundation Policy</i> (LMCC, 2016c)	Sets sea level rise benchmarks for planning, adopted 23 July 2012.
<i>Lake Macquarie Local Environment Plan 2014</i> (Lake Macquarie Local Environmental Plan, 2014)	Development in the coastal zone must 'recognise and accommodate coastal processes and climate change'.
<i>Development Control Plan 2014</i> (LMCC, 2016a, 2017b)	A range of clauses used to assess development applications consider sea level rise.
<i>Flood Control Lots and S149 certificates</i> (LMCC, 2016b, 2016f)	Identifies parcels of land subject to flood controls, based on studies and plans that include sea level rise in their risk analyses.
<i>Lake Macquarie Coastal Zone Management Plan</i> (LMCC, 2015)	Plans for the open coast, the lake estuary and its tributaries and Swansea Channel, and identifies key coastal risk areas for communities, adopted in April 2015.
<i>Planning for Future Flood Risks: Marks Point and Belmont South Local Adaptation Plan</i> (LMCC, 2016d)	Identifies that 391 homes will be at risk in Marks Point and Belmont South if lake levels rise by 0.9m, and sets out actions to respond, adopted in March 2016.

The *Planning for Future Flood Risks: Marks Point and Belmont South Local Adaptation Plan* is one of the first Local Adaptation Plans (LAP) in Australia and it represents a unique and pioneering approach to planning for SLR. The preparation of the LAP was a three-year process which began in August 2013. One month before the first community workshop for the LAP, 800 signatures were collected at a community meeting condemning the Council for their decision to plan for SLR (Giles, 2015). However, LMCC persisted with community engagement (Giles, 2015) and co-designed the planning approach with the community. The local adaptation planning process was seen as a success and LMCC commenced the preparation of a second LAP in 2015 for the suburbs of Pelican and

Blacksmiths. The local adaptation planning approach is worthy of detailed scrutiny, as it represents an opportunity to learn directly from innovative adaptation practice.

1.4 WHY A SOCIAL JUSTICE APPROACH TO PLANNING FOR SEA LEVEL RISE?

To date, economic and biophysical aspects of adaptation to SLR have received much attention. However, economic analyses and biophysical assessments provide little insight into how people's lives will be affected and how costs and benefits will be distributed (Graham *et al.*, 2014). Yet, one of the major challenges of coastal management and adaptation is the distribution of costs and benefits, for example sharing the financial burden of adaptation between residents exposed to risks and others who are not (Cooper and McKenna, 2008; Barnett *et al.*, 2014; Clément, Rey-Valette and Rulleau, 2015; Gibbs, 2016). Equity plays a decisive role in the implementation and evaluation of environmental policies, shaping people's distributive preferences and influencing their willingness to pay for adaptation policies (Clément, Rey-Valette and Rulleau, 2015). There are a number of studies that consider between-country distributional effects of climate change, but a paucity of studies of the local-scale distributional effects (Gibbs, 2016). Thus, this study seeks to address local distributional effects by examining local-scale planning for SLR from a social justice perspective.

Whilst governance of climate adaptation in Australia is primarily undertaken at the local level, there is a role for national and state government in creating opportunities for *adaptive governance*, through enabling legislation, flexible institutions and multilevel governance (Folke *et al.*, 2005). Adaptive governance refers to integrated approaches that take into account a changing and dynamic climate as well as social, economic, and environmental conditions (Few, Brown and Tompkins, 2007). Single-issue approaches to environmental management based on gradual or incremental change are less useful in the current situation where change is occurring more rapidly. Considering the implications of climate change processes for settlements requires a governance framework that can dynamically respond to communities faced with accelerating biophysical changes, and a range of options is needed - from protection in place to community relocation (Bronen and Chapin, 2013). This study considers the influence of governance factors on social justice, and the potential for adaptive governance to support greater consideration of justice.

1.5 ADAPTATION OPTIONS FOR RESPONDING TO SEA LEVEL RISE

1.5.1 Introduction

In coastal areas that are at risk from SLR there are four widely documented adaptation options available: protect (physically protect the coastline); accommodate (redesign, rebuild or elevate existing coastal infrastructure); retreat (move existing development back from the shoreline, relocate

to other areas, acquisition of foreshore land or avoid further development of the foreshore); and do nothing (once SLR and associated hazards encroach on the property it is abandoned and the owner is left to deal with losses and damages) (Cooper and McKenna, 2008, DCC, 2009, Niven and Bardsley, 2013). The protection approach (such as sea walls, groynes, sandbagging, etc.) has the tendency to lead to further protective measures as protection enhances property values, and in some cases protective structures can limit future access to the coast (Niven and Bardsley, 2013). Whereas planned retreat behind natural defences can provide significant benefits as coastal ecosystems help protect development from storm surges, and provide scenery and habitats for plants and animals (Abel et al., 2011). Planned retreat is an adaptation option actively being considered in more high risk coastal areas. In high risk areas, councils in Australia and New Zealand have consulted on or attempted to implement planned retreat policies, for example Byron Shire Council, AU and Hastings District Council, NZ (Reisinger *et al.*, 2014). However, experience in Australia has shown that high litigation potential has undermined retreat policies (Abel *et al.*, 2011), and broad retreat strategies provide little guidance on when or how a retreat policy should be implemented (Gibbs and Hill, 2011). At this stage, retreat remains a theoretical rather than a practical solution.

1.5.2 Implementing planned retreat: a summary of possible approaches

The implementation of planned (or managed) retreat remains largely untested, however, there is a range of possible implementation measures that could be employed along a continuum from voluntary to forced, these are described in Table 3.

Table 3 Typology of approaches to implementing planned retreat

<i>Broad approach</i>	<i>Implementation example</i>	<i>References</i>
Voluntary incentives	Land swaps	Macintosh, Foerster and McDonald, 2015
Voluntary financial instruments	Purchase of affected properties, leasing properties to previous owner, subsidies for relocation, hazard taxes	NSW OEH, no date; Turbott and Stewart, 2006; Cheong, 2011; Macintosh, 2012; Macintosh, Foerster and McDonald, 2015
Non-regulatory information options	Provision of information on coastal hazards within statutory plans	Turbott and Stewart, 2006; Cheong, 2011; Macintosh, Foerster and McDonald, 2015
Market-based incentives	Insurance costs increasing	Cheong, 2011
Regulatory instruments, planning controls	Rolling easements, time limited planning approvals, transferable development rights	Turbott and Stewart, 2006; Cheong, 2011; Macintosh, 2012; Macintosh, Foerster and McDonald, 2015
Forced retreat	Compulsory acquisition instruments	Macintosh, Foerster and McDonald, 2015

There are several barriers to planned retreat policies, including property rights, development interest, and high ‘waterfront’ property values (Cheong, 2011). Some of these approaches to implementing planned retreat can begin to address these barriers. However, each approach has potential costs as well as benefits, for example solutions that involve purchasing land will have high economic costs and others involving forced retreat or market-based incentives will have high social costs. The challenge is identifying how to implement planned retreat in a way that balances and minimises these costs.

1.6 KEY RESEARCH QUESTIONS AND THESIS OUTLINE

Planning for SLR in Australia comes with a set of social justice challenges that are different to those addressed in global climate adaptation, as the differential impacts of and vulnerabilities to climate change are apparent at a much finer scale within countries, states and local areas. Consideration of the social impacts of SLR and the distributional equity of responses to SLR is key to improving local adaptation planning for coastal settlements. My research explores understandings of social justice in

local-scale planning for SLR and planned retreat. Through the case study of Lake Macquarie, the research seeks to address the following questions: 1) What understandings of social justice are held by different actors concerning sea level rise and planned retreat? 2) What principles can improve social justice outcomes in planning for sea level rise? 3) What factors influence social justice in planned retreat? The following chapters set-out to address these questions. Chapter Two explores the existing literature on social justice in planning for SLR and presents a framework to analyse social justice, and examines the social impacts of resettlement and identifies the key factors likely to influence social justice in planned retreat. Chapter Three describes the explorative case study methodology, details the methods used and discusses the limitations of the research. Chapters Four, Five and Six thematically examine understandings of the range and diversity of procedural and distributive justice concerns that relate to planning for SLR in the case study, presents a typology that interprets the range of justice concerns, and develops an understanding of what householders think would influence planned retreat from a social justice perspective. Finally, Chapter Seven outlines guiding principles that could be used in planning and decision-making in relation to SLR.

Chapter 2 Review of literature that explores social justice, planning for sea level rise and resettlement

We believe that social justice is an integral part of environmental governance, including the governance of atmospheric sinks and adaptation to climate change, and that social justice issues are best addressed explicitly and directly. We do not believe that making the equity dimension explicit escalates environmental conflicts. Quite the contrary, keeping social justice off the negotiating table denies the relevance and legitimacy of the concerns and interests of vulnerable actors in the process. (Paavola, Adger and Huq, 2006, p276)

2.1 INTRODUCTION

Explicitly addressing social justice in climate change adaptation is key to the legitimacy of decisions and their material outcomes. Chapter Two seeks to identify how social justice is understood in the relevant literature from geography and the social sciences. There is a diversity of understandings in the literature, a common theme is the importance of both procedural and distributive justice in climate adaptation decisions. The chapter also explores current approaches that address social justice in local planning for SLR in high income countries, and the principles that can be used to guide planned retreat. The chapter is divided into three themes: understanding social justice in adapting to climate change; social justice in local planning for SLR; and guiding more just approaches to retreat in the context of climate change. These three themes are drawn on to develop a social justice framework that incorporates procedural and distributive justice, providing a lens for examining planning for SLR in the case study area. Social justice should be achieved through the recognition, participation and prioritisation of the most vulnerable.

Social justice concerns in adapting to climate change impacts have not been strongly addressed in the discourses on environmental justice or climate justice to date. Broadly, environmental justice concerns of quality of life, present and future generations, justice and equity in resource allocation and environmental conditions, and living within ecological limits have evolved into climate justice concerns of prevention and mitigation of climate change and community vulnerability to climate change (Dow, Kasperson and Bohn, 2006; Schlosberg and Collins, 2014; Vanderheiden, 2016). However, climate justice has primarily focused on prevention and mitigation due to the urgency of reducing the causes of climate change, with debate particularly focused on historical responsibility for greenhouse gas emissions, global carbon sinks, and the international burden sharing of responsibilities for action to reduce emissions and rights to emit (Adger, 2001; Adger, Paavola and

Huq, 2006; Paavola and Adger, 2006). Whilst certainly a priority from the perspective of low-income and developing countries (Ikeme, 2003; Eriksen et al., 2011), there has been less interest in the international discourse in exploring climate change adaptation and its inherent social justice concerns regarding the uneven spatial distribution of impacts and differential social vulnerability to impacts (Adger, 2001; Paavola and Adger, 2006). A focus on social justice in this study aims to develop a deeper understanding of one challenging aspect of climate change adaptation, whilst acknowledging that the broader concerns of environmental and climate justice are no less important.

2.2 UNDERSTANDING SOCIAL JUSTICE IN ADAPTING TO CLIMATE CHANGE

Issues of social justice in adapting to climate change have received relatively limited attention in the climate change literature, which has primarily raised climate justice concerns related to mitigation (Adger, Paavola and Huq, 2006). However, several authors have highlighted the importance of procedural and distributive justice to climate change adaptation (Adger, Paavola and Huq, 2006; Paavola and Adger, 2006; Clément, Rey-Valette and Rulleau, 2015; Graham *et al.*, 2015); and there has been a vibrant debate on distributive justice in international adaptation funding relating to the level of assistance, who should contribute and how it should be distributed (Paavola and Adger, 2006; Grasso, 2010). Climate adaptation actions have social justice implications because their costs and benefits are often distributed in ways that exacerbate rather than reduce current social vulnerabilities (Adger, Paavola and Huq, 2006). As categorically expressed by Paavola, Adger and Huq (2006), social justice should be addressed explicitly and directly.

2.2.1 Principles underpinning social justice interpretations

Social justice is a broad term that can be defined in different ways, which is why it is best to be explicit about how it is understood in specific contexts. Underpinning social justice is the principle of equality – equal rights and entitlements (Taylor, 1994); and strict egalitarian principles aim at an equal distribution of ‘goods’ by recognising existing inequalities in the distribution of that good (Raz, 1988; Parfit, 1997). However, the realisation of equality towards the goal of social justice depends on context and in the field of climate change adaptation there are a range of principles discussed. For example, a *utilitarian* sense of social justice is underpinned by the principle of the greatest good for greatest number (Adger, Paavola and Huq, 2006; Rulleau, Rey-Valette and Clément, 2015); alternatively, justice can be guided by need and prioritise the worst-off, a *redistributive* interpretation (Fraser, 2000; Adger, Paavola and Huq, 2006; Dow, Kaspersen and Bohn, 2006; Lukasiewicz *et al.*, 2013; Rulleau, Rey-Valette and Clément, 2015). Other principles identified in the literature include, ‘*luck egalitarianism*’ which recognises people’s level of responsibility in making

choices, for example differentiated compensation for home owners depending on awareness of sea level inundation risk; and *libertarian* approaches which prioritise property rights; and *efficiency-based* approaches which are guided by value for money and good management (Hayward, 2008; Lukasiewicz *et al.*, 2013; Clément, Rey-Valette and Rulleau, 2015). Employing different principles will lead to different justice outcomes, including different levels of support for adaptation strategies i.e. influencing perceptions of the legitimacy of strategies (Adger, Arnell and Tompkins, 2005) and different implications for adaptation measures and their outcomes (Adger, Paavola and Huq, 2006). So, what are the most appropriate principles to define social justice in the context of climate change adaptation?

In climate change adaptation the principle of 'putting the most vulnerable first' appeals to social scientists and human geographers because it acknowledges existing inequalities and sets out to prevent future inequalities (Adger, Paavola and Huq, 2006; Dow, Kasperson and Bohn, 2006; Graham *et al.*, 2015). Whilst most of the literature concerning social justice in climate change adaptation takes an international perspective, it is argued that adaptation is multilevel in nature, i.e. it is relevant at international, national and local levels. (Adger, Arnell and Tompkins, 2005; Adger, Paavola and Huq, 2006). Even at local scales vulnerable people often have the least involvement in decision-making, so the principle of putting the most vulnerable first acknowledges that decision-making processes must recognise and enable participation for all (Fraser, 2000). However, Graham *et al.* (2015) argue that this principle is less important at a local level, due to the difficulty of identifying the specific groups at highest risk and the risk of reproducing conventional ideas of disadvantage; instead they suggest the focus should be on gathering a diversity of social values within a community. Yet, despite the challenges associated with identifying those at highest risk we should not shy away from this. Miller and Bowen (2013), also note vulnerability should be based on people's own understanding of vulnerability, thus avoiding reproducing conventional ideas of disadvantage. In addition, the acceptance of social justice principles will vary both spatially and temporally (Adger, Arnell and Tompkins, 2005). Therefore, it remains crucial that decision-making processes are based on accurate and appropriate understandings of disadvantage and participation for all, and therefore, should start with local understandings.

Values-based approaches, as discussed by Graham *et al.* (2015), emerged from the literature as a novel way to apply understandings of social justice in the real world. Values-based approaches identify and recognise the diverse and sometimes hidden values of communities, generally using inclusive and participatory processes (O'Brien and Wolf, 2010; Graham *et al.*, 2013, 2015; Wolf, Allice and Bell, 2013; Barnett *et al.*, 2016; Gorddard *et al.*, 2016). Conflicting and competing values can become barriers to adaptation, so addressing values explicitly may have the benefit of improving legitimacy of planned adaptation (Wolf, Allice and Bell, 2013). The values approach is described as a way to identify who will benefit and who will be disadvantaged. As a first step, it can identify the

values that are in conflict, however, explicit principles to inform decision-making in relation to the material object or adaptation strategy need to be part of or an outcome of the participatory process.

Is social justice equal to fairness?

Several authors on climate change adaptation (for example, Adger, 2006; Paavola and Adger, 2006; Graham et al., 2015) regularly use the term fairness synonymously with social justice. In some cases, fairness is used because it is readily and colloquially understood which is important in communicating with the community. However, fairness doesn't fully represent the various and nuanced aspects of social justice that are captured by the more formal term. These aspects are discussed in section 2.2.2.

2.2.2 Key social justice concepts – procedural and distributive justice

Procedural and distributive justice are key concepts in the literature on environmental and climate adaptation governance; they are both equally important to understanding, applying and evaluating social justice. Procedural justice is concerned with the *process of planning and decision-making*, and includes recognition, participation and the distribution of power (Paavola and Adger, 2006).

Procedure can influence outcomes, however it can also influence the legitimacy of decisions regardless of outcomes (Paavola and Adger, 2006). Procedural justice includes: recognition – whose interests are recognized; representativeness - who is participating/who is included; who is excluded; how much power do participants have; and what are the rules of the process (Fraser, 2000; Paavola and Adger, 2006; Paavola, 2007; Lukasiewicz *et al.*, 2013). Distributive justice relates to the *distribution of benefits and costs* between people and also across time (Adger, Paavola and Huq, 2006). Procedural and distributive justice are dependent on each other; if a group is not recognised and cannot participate in decision making its interests are unlikely to inform decisions and this can aggravate inequality (Paavola and Adger, 2006). Timing also has justice implications, timing will affect who can be involved in the planning and how much power they have, and who will be affected by decisions, including future generations (Paavola and Adger, 2006; Garnaut, 2011). Essentially, the concepts of procedural and distributive justice are concerned with decision-making processes, and the distribution of benefits and costs. However, additional factors influence justice in planning for SLR, such as spatial and temporal factors (Graham *et al.*, 2015). Based on a local case study in Australia, Graham et al. (2015) highlighted that 'fairness' has five dimensions - distributive, procedural, interactional, spatial and temporal. They assert that the literature on fairness in climate change adaptation has paid less attention to interactional, spatial and temporal dimensions.

Interactional fairness as described by Lukasiewicz *et al.* (2013) and Graham *et al.* (2015) is concerned

with interpersonal interactions rather than formal aspects of decision-making. Spatial and temporal fairness influence distributive, procedural and interactional fairness and are described in a variety of ways, from the spatial distribution of resources to access to decision-making spaces, and timing of adaptation responses and intergenerational equity concerns (Graham *et al.*, 2015). However, my interpretation is that these examples of interactional, spatial and temporal dimensions are encompassed within the two key concepts of procedural and distributive justice. However, certain spatial and temporal factors, such as scale and timing influence social justice and these will be discussed in section 2.3.2.

2.3 SOCIAL JUSTICE IN LOCAL PLANNING FOR SEA LEVEL RISE

2.3.1 Planning for sea level rise and coastal hazards – retreat, accommodate or protect?

The link between planning for SLR and coastal zone management has provided a small body of literature exploring justice from these related fields. It is widely cited that climate change adaptation for coastal settlements will involve implementation of one or more of the options - to retreat, accommodate or protect from coastal hazards (Neal, Bush and Pilkey, 2005; Abel *et al.*, 2011; NCCARF, 2012; Niven and Bardsley, 2013). Planned retreat has been defined within the field of coastal zone management as movement of existing infrastructure and planned development to avoid coastal hazards and erosion, basically moving out of harms way (Neal, Bush and Pilkey, 2005). Retreat can have other benefits, including conservation and improving public access to beaches (Neal, Bush and Pilkey, 2005; Abel *et al.*, 2011). However, social and economic costs such as allocating the significant financial burden to public or private actors, or alternatively present or future generations, are often the reasons that retreat or relocation is considered the last option (Alexander, Ryan and Measham, 2012; Clément, Rey-Valette and Rulleau, 2015). Examining planned retreat through the lens of social justice highlights some of its challenges.

There is a strong consensus amongst the literature that coastal management and adaptation is difficult due to concerns over the distribution of costs and benefits and political risk (Cooper and McKenna, 2008; Barnett *et al.*, 2014; Clément, Rey-Valette and Rulleau, 2015; Gibbs, 2016). Agyeman, Devine-Wright and Prange (2009) suggest that interventions like planned retreat are more likely to be accepted if they are part of a fair, transparent and inclusive process. However, the principles underpinning fairness need to be explicit, for example, applying the '*luck egalitarianism*' or *responsibility* principle could result in compensation only for outcomes that are beyond individual choice and control, i.e. if people buying properties have been informed of the potential risk of SLR it is assumed that they made an informed decision and consequently they will receive lower compensation payments (Clément, Rey-Valette and Rulleau, 2015). Thus, taking into consideration

that these property owners have benefited from their decision, by enjoying a waterfront property or purchasing a discounted property. Key lessons to guide us in tackling the difficult problem of coastal adaptation can be drawn from previous studies.

The literature exploring factors relevant to social justice in planning for SLR is largely focused on case studies, as coastal impacts often play-out at local scales. A selection of case studies from high income countries ranging from Australia to Alaska in the US are detailed in Appendix A. Some of the most relevant studies were in-depth explorations of local cases. For example, at Waihi beach, NZ, Hayward (2008) found if public engagement in planning and decision-making is restricted to identified individuals and stakeholder groups, then these processes become an opportunity to exercise private property rights rather than improving procedural justice. In a survey of coastal and hinterland residents in the south of France, Clément, Rey-Valette and Rulleau (2015), found that *responsibility*-based compensation for retreat was favoured by hinterland residents and coastal residents preferred a market-based compensation approach with national funding.

The key learnings from the diverse case studies examined centre on participation and values, i.e. the importance of participation for all, and explicitly identifying values, as multiple and divergent values and decision-making frames are drawn upon by individuals and communities (Alexander, Ryan and Measham, 2012). These two factors combined will enhance the legitimacy of sea level rise planning decisions. Additionally, from the case studies that discussed planned retreat specifically, a planned or staged process of retreat was favoured. The other key factors influencing successful retreat were related to governance, including the presence of national funding, a suitable and/or adaptive governance framework, and political will and power to not only undertake retreat, but also share the costs and protect the most vulnerable (Bronen and Chapin, 2013). These governance themes are discussed in the next section.

2.3.2 Key factors influencing social justice – scale, governance and timing

Scale, governance and timing are factors that have been identified in the literature as having significant influence on social justice in coastal planning (Cooper and McKenna, 2008; Clément, Rey-Valette and Rulleau, 2015). Scale is a factor that has been identified in coastal management literature as having significant influence on social justice in coastal planning (Cooper and McKenna, 2008; Clément, Rey-Valette and Rulleau, 2015). For example, Cooper and McKenna (2008), examined coastal erosion management from a social justice perspective and found that the argument for public interventions to protect private property are strongest at the local and short-term level and they weaken at geographically larger and longer time scales, due to intergenerational equity concerns and costs to non-coastal residents and the environment. Similarly in France, adaptation policies implemented at a national scale are faced with the challenge of sharing the financial burden of

adaptation between exposed and non-exposed communities (Clément, Rey-Valette and Rulleau, 2015). Few, Brown and Tompkins (2007) also highlight there is a mismatch between the national or regional scale of climate change planning and the local scale of coastal action, whereby broad policies to plan for SLR are impossible to implement at local scales due to limited local capacity to create long-term local plans and lack of clear implementation plans.

Lack of local government resources (financial) and capacity (human) was identified as a key challenge in SLR planning (Few, Brown and Tompkins, 2007; Abel *et al.*, 2011; Measham *et al.*, 2011).

Furthermore, overarching governance and legal frameworks are still lagging behind the demands of climate change adaptation, as local actors like communities in Alaska are willing but unable to take action due to the need for adaptive governance (Few, Brown and Tompkins, 2007; Bronen and Chapin, 2013), see Appendix A. As mentioned in Chapter One, *adaptive governance* can address the need for flexibility and transformation driven by climate change.

Timing is another crucial factor in planning for SLR, for example planned retreat can be pre-emptive (planned well before inundation), just in time (when risk increases to an unacceptable level) or reactionary (after a major inundation event) (Neal, Bush and Pilkey, 2005; Gibbs, 2016). Each has different implications for cost. At a broad scale, Stern (2007) and Garnaut (2011) both identify it is cheaper to adapt now rather than later. However, due to the uncertainty in predicting SLR it is not clear when to intervene and there is a strong tendency to postpone (Clément, Rey-Valette and Rulleau, 2015). Many home owners will not be concerned about a potential increase in the risk of inundation in future decades, however when present-day home owners perceive that proposed adaptation plans will immediately negatively impact the value of their house they will likely oppose such plans (Fincher, Barnett and Graham, 2015; Gibbs, 2016). In recognition of these scale, governance and timing problems *adaptation pathways*, a staged planning approach triggered by environmental or social changes (Barnett *et al.*, 2014), has been proposed as an approach that ensures flexible, fair and resilient responses to climate change.

2.4 GUIDING MORE JUST APPROACHES TO RETREAT

Planned retreat in response to climate change is an adaptation response that is likely to have more significant and immediate social impacts than the options to protect or accommodate.

2.4.1 A resettlement perspective

Studies of social justice in climate change adaptation and coastal zone management, based largely on theoretical exploration, hypothetical surveys and case studies (Adger *et al.*, 2006; Paavola and Adger, 2006; Cooper and McKenna, 2008; Hayward, 2008; Ryan *et al.*, 2011; Clément, Rey-Valette and Rulleau, 2015; Hino, Field and Mach, 2017), found that challenging conflicts arose over the potential

distribution of costs and benefits in relation to proposed coastal adaptation approaches, especially retreat. I sought a perspective on retreat in this study that looked beyond the climate change adaptation lens, to draw on broader, lived experiences of relocation and resettlement. It is important to note that resettlement is a concept used for not just the physical movement of people (relocation) but also to describe the process to assist relocated people to replace housing, assets, livelihoods, land, access to resources and services; and to maintain communities and to restore living standards, including economic, social, cultural, environmental and psychological considerations (Correa, Ramírez and Sanahuja, 2011; McAdam and Ferris, 2015). There are generally two main drivers for relocation or resettlement - disaster or natural hazard, or development. In contrast, climate-related resettlement may be driven by natural hazards with dramatic or slow-onset impacts, and people may be moving because of a perceived threat or actual deterioration of the environment (Bardsley and Hugo, 2010; King *et al.*, 2014). Climate-related resettlement shares some characteristics with both disaster and development-induced resettlement, therefore there are insights to be gained from the research on lived-experiences of resettlement.

2.4.2 Resettlement and climate change

Climate change induced displacement, migration and planned relocation has been acknowledged by the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) as an adaptation strategy (UNFCCC, 2010) and it is expected that the majority of climate change-related movements will be within a country or local in scale (Doberstein and Tadgell, 2015). Climate-related resettlement is already underway, in the Mekong River delta (Vietnam), along Limpopo River (Mozambique), on the coast of Alaska, in the Inner Mongolia Autonomous Region (China) and Carteret Island (Papua New Guinea) (de Sherbinin *et al.*, 2011). Therefore, as stated by de Sherbinin *et al.* (2011), “given the emergence of resettlement as an adaptation response, it is critical to learn from research on development-forced displacement and resettlement” (p456). Within the climate-displacement literature it is clear this learning is well underway (de Sherbinin *et al.*, 2011; Mathur, 2015; McAdam and Ferris, 2015). For example, it has been highlighted that those who are able to move away from harm will relocate early, while others without financial or social support or due to family commitments will be dependent on government assistance for relocation (King *et al.*, 2014; McAdam and Ferris, 2015). It has been raised as a possibility that a coordinated and well-planned resettlement process could address the negative consequences of broad relocation policies (de Sherbinin *et al.*, 2011; Mathur, 2015). So, there is an opportunity to learn from past resettlement experience in the design of processes and procedures for climate-induced resettlement, yet social justice needs to be a central concern.

2.4.3 Impacts of resettlement

The negative consequences or impacts of resettlement are well-documented (Cernea, 1997; Correa, Ramírez and Sanahuja, 2011; McAdam, 2015) and recent work has predicted the potential impacts of climate-induced resettlement (McMichael, Barnett and McMichael, 2012; Mathur, 2015). The eight key risks and impoverishment processes in displacement, identified by Cernea (1997), are widely acknowledged in the literature; these are: landlessness, joblessness, homelessness, marginalization, food insecurity, loss of access to common property resources, increased morbidity and community disarticulation. Of particular relevance, the social and health impacts of resettlement differ between localities and regions, and impacts can depend on where the move belongs in a continuum from planned, voluntary and proactive to involuntary, forced and sudden resettlement (Black *et al.*, 2011). Displaced people experience depression and trauma associated with loss of home and material resources, fragmented social networks, economic deprivation and loss of power (Read, 1996; Cernea, 1997; Albrecht *et al.*, 2007; Correa, Ramírez and Sanahuja, 2011; Munro, 2012). Therefore, in seeing planned relocation as a climate adaptation strategy some key considerations should be taken into account including the extent that relocations might be necessary, under what conditions they need to occur, the way they should be implemented and the possible costs (McAdam and Ferris, 2015). From a social justice point of view climate-induced resettlement has significant implications because those that are most vulnerable to climate change and therefore displacement, are often those that are least able to cope.

2.4.4 Guiding principles for resettlement decision-making

Considering the severe impacts of resettlement, how might climate-induced resettlement be undertaken in a way that minimises social impacts. Two internationally relevant documents influence and guide the over-arching principles of climate-induced resettlement: the Nansen Initiative and the Peninsula Principles. The Nansen Initiative addresses cross-border displacement and the Peninsula Principles provide a normative and practical rights-based framework for responding to and preparing for climate-related displacement within states (Leckie and Simperingham, 2015). Importantly, the Peninsula Principles highlight that climate displaced people have a right to remain in their homes on their land for as long as possible (Leckie, 2013). Table 4 presents eight key practical factors identified in the development-induced and climate displacement literature that should guide resettlement decision-making.

Table 4 Key factors guiding resettlement

Key Factors	References
1. Supporting policies and law	Mathur, 2015
2. Government commitment to improve outcomes for communities	de Sherbinin <i>et al.</i> , 2011; Sipe and Vella, 2014; Mathur, 2015
3. Avoid resettlement, explore alternatives and conduct baseline research	Correa, Ramírez and Sanahuja, 2011; Bronen and Chapin, 2013; Mathur, 2015
4. Long-term planning and consider appropriate timing	de Sherbinin <i>et al.</i> , 2011; Bronen and Chapin, 2013; Mathur, 2015; McAdam and Ferris, 2015
5. Participation for all (including vulnerable people and host communities) and community consent (free and informed)	Oliver-Smiths, 1991; Agyeman, Devine-Wright and Prange, 2009; de Sherbinin <i>et al.</i> , 2011; Leckie, 2013; Sipe and Vella, 2014; Mathur, 2015; McAdam and Ferris, 2015
6. Adequate compensation to allow resettlement on safer land	de Sherbinin <i>et al.</i> , 2011; Bronen and Chapin, 2013; Fujikura and Nakayama, 2013; Leckie and Simperingham, 2015; Mathur, 2015; McAdam and Ferris, 2015; Hino, Field and Mach, 2017
7. Move as a community and provide support	Oliver-Smiths, 1991; de Sherbinin <i>et al.</i> , 2011; Fujikura and Nakayama, 2013; Sipe and Vella, 2014; Leckie and Simperingham, 2015; Mathur, 2015
8. Dispute resolution processes	Correa, Ramírez and Sanahuja, 2011

Consideration of these factors in resettlement decision-making highlights how complex resettlement is, and that it is a significant issue that requires advance-planning and a coordinated approach from all levels of government. The importance of a social justice approach in climate adaptation is reinforced by these principles and their focus on procedural and distributive justice, specifically: prioritising avoidance of resettlement, community participation in decision-making, free and informed consent, addressing the concerns of vulnerable people, provision of adequate compensation and a defined dispute resolution processes.

2.5 CONCLUSION: A SOCIAL JUSTICE FRAMEWORK FOR SEA LEVEL RISE PLANNING

Further research is required to understand when and how to implement planned retreat (Hino, Field and Mach, 2017). My research seeks to explore how understandings of social justice can inform and

improve approaches to planned retreat and planning for SLR. The social justice framework, illustrated in Figure 4, draws together key points from the climate adaptation and resettlement literature that are applied conceptually and analytically to the case study findings presented in Chapters Four, Five, and Six. The framework shows that social justice is made up of both procedural and distributive justice, which is influenced by the overarching factors of timing, governance and scale. Procedural justice is determined by the extent recognition, participation for all and balances of power are addressed, and distributive justice is determined by specific underpinning principles and values, such as the principles of priority for the greatest need or greatest good for greatest number, and what things are assigned worth or value.

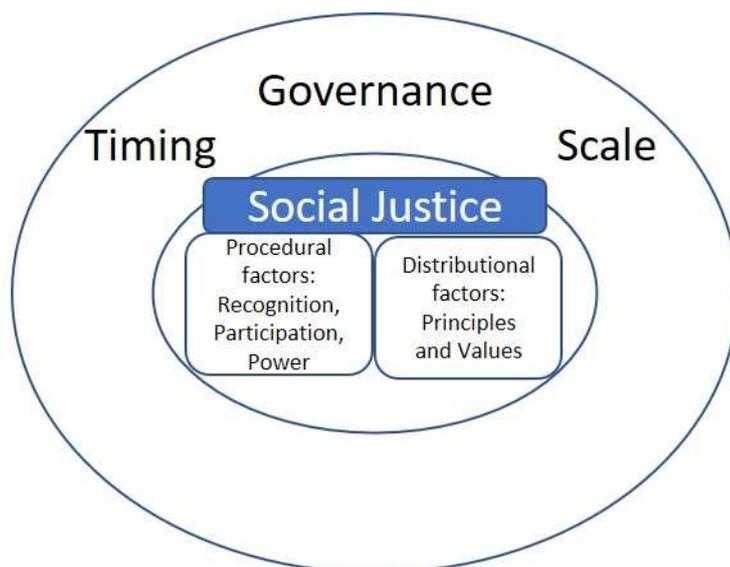


Figure 4 A conceptual framework for understanding social justice in planning for sea level rise

My research on diverse understandings of social justice in planning for SLR will be analysed using this framework and my conclusions will be informed by social justice in a normative sense. Social justice should actively include those who are disadvantaged, through the equal distribution of recognition, inclusive participation and by redressing power imbalances. Distributive justice should prioritise those who are most socially vulnerable to address current and prevent further disadvantage. In summary, for social justice to be adequately addressed it needs to consider both procedural and distributive aspects, and recognise that timing, governance and scale are integral to shaping the successful (or otherwise) realisation of justice.

Chapter 3 Methodology: a qualitative and explorative case study

Although this approach is labour intensive and can make it difficult to generalize across studies, it has the advantage of uncovering how people are articulating their values rather than asking them to react to survey items that may not adequately tap how people are thinking. (Dietz, Fitzgerald and Shwom, 2005, p355)

3.1 INTRODUCTION

Considering the complex and contested nature of conceptions of social justice, and the neglect of social over biophysical and economic considerations in climate adaptation, I have chosen a methodology that aims to address social justice and the material outcomes of decisions explicitly. A rich case study of Lake Macquarie will examine the local context and explore the range and diversity of social justice interpretations important to local actors. A case study approach enables a rich, grounded understanding of a particular context to be developed and it also grounds our understanding of particular theories (Bryman, 2012; Baxter, 2016). I will be using a case study to test the relevance of, and contribute learnings, to theories of procedural and distributive justice (Adger, Paavola and Huq, 2006; Graham *et al.*, 2015). Lake Macquarie was selected as an appropriate case study to explore social justice in planning for SLR as it has a very high number of residential buildings at risk from SLR, as discussed in Chapter One. Moreover, LMCC has developed one of the first local adaptation plans for SLR in Australia (LMCC, 2016). As such, this enables me to gather data and develop an understanding of responses in the context of the current planning situation, rather than a hypothetical situation. In this chapter I will outline the methodological approach adopted in the study and explain the methods used to produce the case study.

3.2 METHODOLOGICAL APPROACH: FRAMED BY SOCIAL JUSTICE THEORY

Situated within the field of human geography, this research adopts a qualitative methodology with a critical rather than positivist approach (Kitchin and Tate, 2000b). This research is situated within an Australian context, acknowledging it to be a high-income country with a densely-settled and much-loved coastline, and a significant number of settlements likely to be affected by SLR. Therefore, it is focused on social justice in a context that could inform other high-income countries. The research is also shaped by my personal positionality, as a local government environment officer in Western Sydney, NSW, for the last eight years; I have been involved in climate adaptation planning, and studying the Urban Heat Island effect and social vulnerability to heat in the Council area. My local

government experience gives me an insider's perspective of the practical and strategic challenges that local governments face in planning for climate change. My educational background in Environmental Science, provides me with an awareness of the impacts of climate change on natural ecosystems.

The qualitative analysis is framed by theories of social justice and a mixed methods case study approach is adopted. A case study as a methodological approach is guided by the principle that an in-depth and context sensitive understanding of one case is valuable, and may solve problems associated with the case or broaden understanding or theory more generally (Kitchin and Tate, 2000b; Baxter, 2016). Case studies also enable wider scale processes, such as climate change, to be studied within particular social, economic and environmental contexts. The research problem lends itself to this open-ended methodology because it enables deeper exploration of complex problems. Conversely, quantitative approaches, such as questionnaires or surveys, are limited when dealing with complex social problems as they cannot explain how or why an action or relationship exists (McGuirk and O'Neill, 2016).

My theoretical approach is informed by an awareness of social justice as a normative concept which can be defined and understood differently by different people. Thus, the case study is framed by the specific concepts of procedural and distributive justice, and guided by the principles of inclusive participation for all and priority for the greatest need. So, this conception of justice will help to explore and make sense of other peoples understandings of justice. However, the exploration of a range of understandings of social justice will identify a variety of principles and values, and these will be critically analysed using the framework illustrated in Figure 4.

I have developed a three-part approach to addressing my overarching research question - how can planning for sea level rise and the option of planned retreat be undertaken in a socially just way? My research aims to address the following three questions:

- 1) What understandings of social justice are held by different actors concerning sea level rise and planned retreat?
- 2) What principles can improve social justice outcomes in planning for sea level rise?
- 3) What factors influence social justice in planned retreat?

The degree to which the values of a community are reflected in local plans influences the perceived legitimacy of these plans. Towards this aim, the first research question will inform my understanding of the legitimacy of local SLR planning decisions. Research questions 2) and 3) seek to generate practical outcomes from the research that may be applicable in other coastal

settlements vulnerable to SLR¹. Figure 5 demonstrates how each research question will be addressed through the research methods.

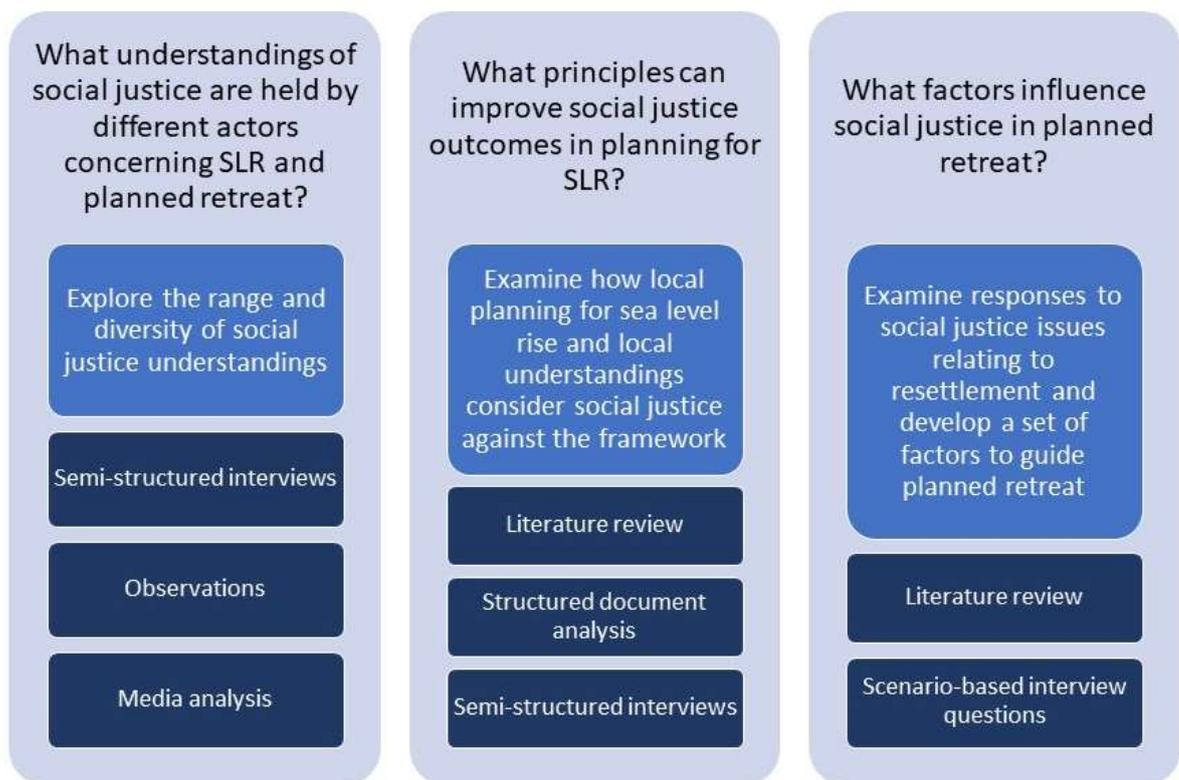


Figure 5 Research Questions, Objectives and Methods

3.3 METHODS: A MIXED METHODS APPROACH

The research involved a mixed methods approach to gather different types of data from a range of sources including academic and grey literature, print media, site visits, in-depth interviews, and observations of the community working group. In particular, the interviews produced a rich and varied data set of self-reported opinions and feelings, and the observations allowed me to interpret what was happening and why (Kitchin and Tate, 2000a).

Initially, a literature review was conducted to identify different disciplinary understandings of social justice, and to identify research documenting the implementation of planned retreat. Firstly, I identified different understandings of social justice and strategies that have been used to address social justice in planning for SLR in Australia and internationally. Secondly, a review of literature was used to generate a typology of implementation approaches for planned retreat, see Table 3. A typology is useful in synthesising information, aiding comprehension and facilitating analysis (Maur,

¹ The original research proposal included a Participatory Workshop with key stakeholders to develop a shared understanding of procedural and distributive justice in relation to planning for sea level rise and retreat, however due to budget and time constraints this has been postponed until November and will focus on sharing research findings rather than data collection.

Langridge and Lin, 2011 cited by Macintosh, Foerster and McDonald, 2015). The literature review supports and informs the case study however it is an internet-based review and it is not exhaustive. It is limited by the search-terms used and largely limited to materials published on the internet and in English. The exploration of peer-reviewed literature was undertaken using key word searches, incorporating combinations of the following terms: sea level rise, climate change, social justice, equity, fair, planned retreat, managed retreat, resettlement and displacement. This search generated over 60 relevant texts from the fields of human geography, social science, environmental science, law and planning. Additional texts were reviewed by following leads from relevant texts. The texts most relevant to the research problem were grouped into the following areas: climate change and social justice; retreat from SLR and coastal erosion; resettlement and climate change displacement; SLR impacts in Australia; and SLR in Australian planning and law, as addressed in Chapters One and Two.

The case study captured both perceived and actual aspects of the planning process and understandings of social justice in the Lake Macquarie area. The methods included:

- a) Structured document analysis of government plans and policies relating to SLR and local planning (primarily Lake Macquarie City Council and NSW government materials available on publicly accessible websites), to develop an understanding of the context over the last ten years. Thirteen documents were identified and analysed to determine how and to what extent each document addressed SLR, including social impacts, equity, governance, timing and planned retreat. This analysis was undertaken using key word searches and answering a series of closed and open-ended questions about each document.

- b) Media analysis included local newspapers for selected NSW coastal areas and Sydney-based newspapers, to understand the ways this problem is being identified in the local media. I examined traditional print media only as it is an important source of local news. The 12 newspapers - *The Sydney Morning Herald*, *The Daily Telegraph*, *The Sun Herald*, *Newcastle Herald*, *The Star* (Newcastle), *South Coast Register* (Nowra), *Daily News* (Tweed Heads), *Port Stephens Examiner*, *Port Macquarie News*, *Illawarra Mercury* (Wollongong), *Bega District News* and *The Northern Star* (Lismore) – were searched from 2009 to mid-2017 using the key words “sea level rise” and a subject filter “sea level” was applied, the number of articles each year was noted and the first 50 articles in each newspaper were analysed to ascertain the type of article (analytical, investigative, report, comment, letter to the editor or irrelevant) and for the presence of key words: social, justice, unjust, equity, fairness, unfair, compensation, who pays, and retreat. The key word “fair” was unable to be used due to the high number of instances it was retrieved.

- c) Site visits were undertaken to become familiar with the physical geography of the Lake Macquarie area.
- d) Observation of participants in a Council-led community working group meeting for local adaptation planning was undertaken, to give an insight into how the group process operates from a procedural justice perspective.
- e) Semi-structured interviews and group interviews with key informants were conducted to explore the potential for and understandings of justice in SLR and planned retreat strategies. Key informants included people involved in the local adaptation planning processes and local community groups. The interviews with key informants (13) included local and state government staff, householders and representatives of local Aboriginal organisations (as shown in Table 5). Group interviews were undertaken with government staff to gather the data efficiently, the interviewees were senior officers or managers with direct responsibility for planning for SLR, so there were no power-based issues to consider in the interview setting.

Table 5 Summary of Interview Participants

Interview Participants	Number	Codes
Householders living in Lake Macquarie LGA	6	H1-6
Key Informants – householders involved in local adaptation planning	5	KI1-5
Key Informants - officers from local and state government	6	O1-4, SO1-2
Key Informants - representatives of local Aboriginal groups	2	A1-2
TOTAL	19	

- f) Semi-structured interviews with householders were conducted to explore the potential for and understandings of justice in SLR and planned retreat strategies amongst people living in the Lake Macquarie LGA. Interviews with householders included a total of eleven people. A purposive sampling approach (Stratford and Bradshaw, 2016) included householders who are involved in SLR planning (five key informants) and other householders who are not (six), and within this group there were householders likely to be directly affected by SLR and others who are not, as illustrated in Figure 6. Six householders lived in low-lying and coastal suburbs and five others lived in more elevated areas surrounding Lake Macquarie.

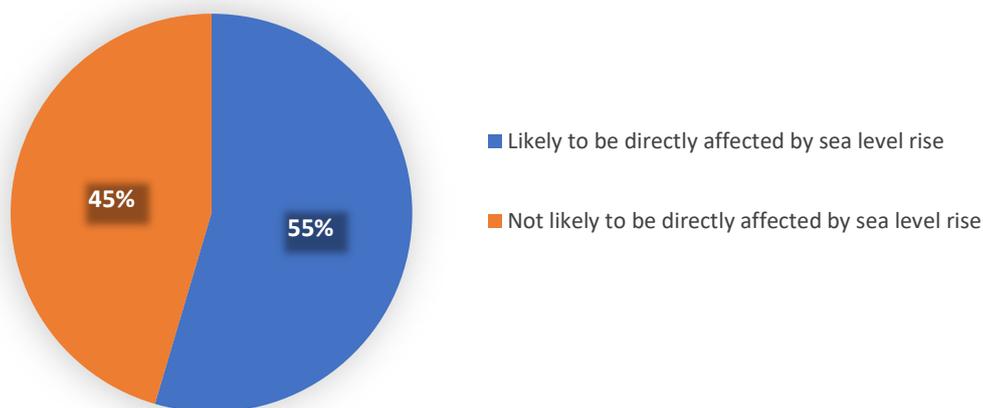


Figure 6 Proportion of householders interviewed likely to be directly affected and not affected by sea level rise

The interview questions for householders did not ask about specific situations for each householder, (see Appendix B) rather they were asked for their opinions generally on planning processes, adaptation options and planned retreat scenarios to minimise any possible distress caused by discussing the impacts of SLR on their homes.

The qualitative interview-based approach contrasts with the quantitative survey work prevalent in previous studies on attitudes to planning for SLR (Alexander, Ryan and Measham, 2012; Lo, 2014; Clément, Rey-Valette and Rulleau, 2015). Interviews are an effective way of gathering in-depth data on how people are articulating their values, allowing participants to speak for themselves rather than asking them to react to a survey (Dietz, Fitzgerald and Shwom, 2005). So, interviews were the most appropriate method for the exploratory questions I wanted to ask.

The study involved 19 participants in interviews with only 11 householders; the recruitment of householders was challenging due to the need to recruit participants beyond those individuals who are directly affected by SLR and the time constraints of the project, as field work was conducted within a 3-month timeframe (June – August 2017), see Appendix C Interview Register. Recruitment of householders involved three methods: 1) snowballing - asking participants already interviewed to pass on my contact details to local neighbours, friends and family; 2) posters on local community noticeboards and articles in community newsletters; and 3) directly contacting local community groups and community service organisations to ask if they could tell their clients or members about the study. Efforts were made through the third method to contact a wide range of participants including socio-economically disadvantaged communities via neighbourhood centres and community support organisations; however, these were not successful. Snowballing and direct contact were the most successful recruitment methods, and due to the short timeframe available all of those who expressed an interest were interviewed.

The purposive sampling approach was intended to be combined with illustrative sampling of the local population to include households from a range of demographic categories. The socio-

economic demographics of the householders interviewed are shown in Table 6, their ages range from 20 to 74, but mostly fall within the 65-74 years bracket. The highest educational attainment ranged from Year 11 or below to Post Graduate Degree, with 6 householders obtaining university level education. Household income ranged from low to high, however there were no households earning in the highest bracket, above \$104,000 annually. In relation to home ownership, most owned their home outright which is consistent with the Lake Macquarie LGA where there is a high percentage of home ownership. The householders interviewed were also asked how long they had been living in the Lake Macquarie area, with answers ranging from three to 65 years or their whole life. As shown in Figure 7, most householders had been living in the area for over 10 years.

Table 6 Summary of participating householders demographics

Age	No.	Highest Educational Attainment	No.	Annual Household Income	No.	Home	No.
15-19	0	Year 11 or below	2	Up to \$31,199	3	Owned outright	9
20-24	1	Year 12 or equivalent	2	\$31,200 – 64,999	3	Owned with a mortgage	2
25-34	0	Certificate Level	1	\$65,000 – 103,999 -	5	Rented	0
35-44	1	Diploma	0	\$104,000+	0	--	--
45-54	1	Bachelor Degree	3	--	--	--	--
55-64	1	Grad. Diploma or Certificate	1	--	--	--	--
65-74	7	Post Graduate Degree	2	--	--	--	--
75-84	0	--	--	--	--	--	--
85+	0	--	--	--	--	--	--

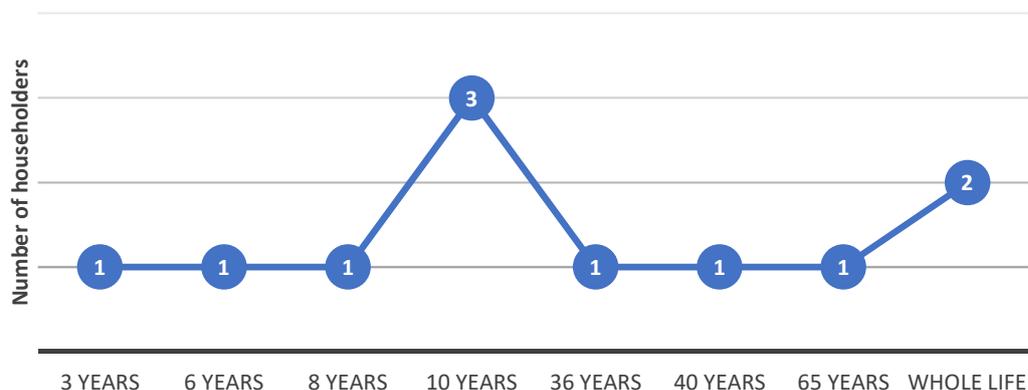


Figure 7 Years living in the Lake Macquarie Area

The mixture of methods that I used generated different kinds of data to build a more robust case study. Therefore, householder interviews were bolstered by key informant interviews, and the document and media analysis.

3.4 LIMITATIONS IN THE METHODOLOGY

The limitations of the research are mainly due to the short timeframe available to conduct the entirety of the project, from 1 January to 9 October 2017, which included finalising the proposal, gaining ethics committee approval² (see Appendix D), conducting desktop and field research, and preparing the thesis. The methodological limitations of the project include its focus on only one case study area, rather than a comparative case study which could compare and contrast between different types of settlements. The interview-based research methods are limited by the number and diversity of people that participated in interviews. As this number was relatively small and the participants were not illustrative of the local population I was unable to gather data on understandings of social justice from socio-economically disadvantaged communities and some key demographic groups, including the 25-34 age bracket and people renting their homes. However, the individuals interviewed expressed a diverse range of views which enabled me to meet my aims. Similarly, there was a risk that the only people interested in participating in the project would be low-lying, coastal landowners, however five interviewees were from elevated areas, so this did not impose further limitations on the diversity of the data gathered.

Further research on social justice in planning for SLR could draw on other methodological approaches. Multiple case studies could be used to provide a rigorous test of theories in different types of settlements or across different states or countries. Other research methods could focus on a

² Human Research Ethics Committee Approval was granted on 29 March 2017 by Dr Karolyn White, # 5201700096.

critical analysis of planning for SLR from a social justice perspective, by analysing planning and policy documents. However, as the first detailed case study of understandings of social justice in relation to planning for SLR and retreat in a densely settled coastal area, this research presents a unique approach to a complex topic.

Chapter 4 Governance: uncertainty, shifting responsibilities and mistrust

Who bears the cost is partly a policy space where there hasn't been [any] policy, so there is the need for policy... to address the social elements of this space. (Key Informant)

4.1 INTRODUCTION

Addressing climate change in a fair and sustainable manner requires an adaptive governance framework that responds dynamically to communities facing biophysical changes (Bronen and Chapin, 2013). Governance in NSW has presented challenges to planning for SLR through: the State government's backflip on SLR policy; lack of leadership; inflexibility of existing planning controls; and self-serving, political decision-making. These challenges were discussed by several interview participants, particularly key informants from local and state government, and were further supported by the media and document analysis.

4.2 CHANGING SEA LEVEL RISE POLICY

Climate change is dynamic and uncertain, it requires adaptive governance. However, high-level policies are vital to guide long-term directions. Planning for SLR in NSW has been marred by a significant policy backflip at the state government level. These changes in policy and planning, as described in Table 7, have led to uncertainty and instability in local planning.

Table 7 NSW Sea Level Rise Policy and Planning changes

Policy/Plan	Description
<u>2009</u> - NSW Sea Level Rise Policy Statement	The first policy on sea level rise in NSW, supports consistent adaptation to projected sea level rise impacts (DECCW, 2010).
<u>2010</u> - Coastal Planning Guideline: Adapting to Sea Level Rise	Sets a planning benchmark of a 0.9m rise in sea levels by 2100 above 1990 levels (Department of Planning, 2010).
<u>2010</u> - NSW Government Coastal Reforms: Stage 1	Identified requirements for councils to develop Coastal Zone Management Plans which included state sea level rise benchmarks (LG NSW, no date).
<u>April 2012</u> - Assessment of the science behind the NSW Government's sea level rise planning benchmarks	NSW Chief Scientist and Engineer report assessing the science behind the sea level rise planning benchmarks found the science was sound and made four recommendations to state government: regularly update sea level projections; undertake regionally specific calculations; establish a Technical Advice Centre to support local councils; and communicate sea level rise to local councils and members of the public in plain English (O'Kane, 2012).
<u>September 2012</u> - Sea Level Rise Policy was repealed	Policy was repealed on the basis that coastal councils needed the flexibility to address localised circumstances and determine their own projections to suit their local conditions (NSW OEH, no date).
<u>2015</u> - NSW Government Coastal Reforms: Stage 2	New coastal management framework opened for consultation, including the Coastal Management Act 2016, the Coastal Management State Environmental Planning Policy and a new Coastal Management Manual and Toolkit, guidelines are provided for local government to plan for sea level rise at a local scale (NSW DPE, 2017). These coastal reforms have been significantly delayed due to Ministerial changes (Hannam, 2017).

The NSW Sea Level Rise Policy introduction in 2009 and subsequent repeal in 2012 had significant implications, it contradicted the NSW Chief Scientist and Engineer's recommendation that the science was sound and left a policy vacuum for local councils who were not technically equipped to adopt their own SLR projections. Key informants from local and state government raised a number of issues regarding the policy environment, including the impact policy change has had on acceptance

of the science, the lack of leadership from state government, and neglect of social policy. A key informant from state government, noted that:

there's a chief scientists report which basically confirmed that the science behind those numbers was sound, but the government decided to ditch the policy in any case and we're still basically working through a process to replace it with something and it's been highly contentious ever since when the science is fairly, well, very clear (SO2).

Two key informants (SO1, SO2) from state government also commented on the challenge of getting the science of SLR accepted in the wake of this state policy change. A key informant asserted that the state government justified the repeal by saying:

councils should be able to set their own benchmarks based on local conditions and it was basically a misinterpretation of the advice... there is no evidence whatsoever to support a significantly variable sea level rise in the ocean along the NSW coast and yes the impact of the ocean going up is going to be different depending on the estuary type but this was taken into account anyway in our earlier work (SO2).

The above quotes, highlight that State government has undermined the science of SLR and deliberately devolved responsibility for planning for SLR to local government.

These policy changes reflect a lack of leadership at a state level (SO1), with one local government officer referring to the state government's approach, saying, "it's not surprising that we can't get policy certainty at the federal and state level when there is a capacity to push all of that policy responsibility down to the lowest tier of government" (O1). Two local government officers referred to the need for policy certainty and stability at a state level (O1, O2). A key informant from state government identified that councils were not happy when the planning benchmarks were dropped, however, they went on to say, "I'm in agreement that the approach needed to be a lot more sophisticated than just two numbers but we also recognise that it's really hard for councils to make these decisions and I think they probably need more assistance" (SO1). This sentiment, concerning the need for support and clear guidance for local governments, reflects the Chief Scientist and Engineer's key recommendation in relation a Technical Advice Centre for local government (O'Kane, 2012).

Concerns were also raised about the timely provision of technical support for local government (O1) and the state government's expectations of local government to undertake technical analyses as a result of the Stage 2 Coastal Reforms. Including the use of tools such as cost-benefit and distributional analysis and probabilistic modelling, as prescribed in the Draft Coastal Management Manual (O1).

To adequately support planning for SLR it was recognised that there is also a need for policy on the social equity aspects of planning for SLR, as described by one key informant, “Who bears the cost is partly a policy space where there hasn’t been [any] policy so there is the need for policy... specifically to address the social elements of this space” (SO1). This claim is supported by the document analysis, as there are currently no state government policies addressing SLR, and current plans, such as the *Guidelines for Preparing Coastal Zone Management Plans* (NSW OEH, 2013) provide only high level guidance to consider social, economic and environmental factors and impacts. However, the *Consultation Draft: NSW Coastal Management Manual, Part A: Mandatory requirements and essential elements for the preparation of a coastal management program* (NSW OEH, 2015) provides more in-depth guidance on considering equity issues through a distributional analysis, which should consider council, agency, directly affected coastal community stakeholders (such as landholders in coastal hazard area), indirectly affected coastal community stakeholders and the environment. It also states that “the costs of coastal management actions should be apportioned among beneficiaries, taking into account capacity to pay” (NSW OEH, 2015).

The lack of state government leadership, since the repeal of the 2009 Sea Level Rise Policy, left local governments to develop their own policies and procedures in an ad hoc way. The Stage 2 Coastal Reforms will address some of these concerns, however, a significant amount of technical analysis and planning effort remains the responsibility of local governments.

4.3 PREFERRED GOVERNANCE APPROACHES

The current governance arrangements for addressing climate change and SLR are described in section 1.1.2. Governance approaches define the roles and responsibilities of different parties, influence the extent to which adaptation options are seen as legitimate, just and efficient (Adger, Arnell and Tompkins, 2005), and influence material outcomes. Key informants and householders expressed a diversity of preferences for the governance of addressing SLR, summarised in Table 8. The table captures a range approaches from limited government intervention to the establishment of a federal government body to address SLR.

Table 8 Householder and key informant-preferred governance approaches to address sea level rise

Governance Approach	Example Interview Quotes
Federal government led	“An independent body that is going to be responsible, it would need to be divorced from climate change, more specifically it would have to be rising sea level preparatory body... certainly not a local council” (H4)
Clear development guidelines and legislative force	“A controlled and precise approach, not just encouraging people to do the right thing...legislative force that can be applied... statutory responsibility on the government to listen to science and not just take it and weigh it up with commercial or economic arguments” (H5)
Councils role to protect community	“it’s up to Council to say this is how we’re going to control it, because they’ve got to look after tax payers...” (A1)
State look after public assets and provide warnings only	“State has to provide warnings and not be restrictive... not mandated.” (K13)

More of the interviewees discussed governance approaches that involved high-level government leadership and responsibility for addressing SLR. Additionally, in response to the lack of consistency and leadership, interviewees identified the need for clear guidelines and legislation.

4.4 INFLEXIBILITY OF EXISTING PLANNING CONTROLS

Land-use planning controls are the primary tool used in planning for SLR by limiting or avoiding new development in at-risk areas, and highlighting hazards that relate to new and existing development in at-risk areas. The limitations of planning controls were highlighted by key informants and householders through their discussion of the need for ‘sensible’ planning, the inflexibility of planning controls, and calls for planning reform.

Reflecting the requirements of adaptive governance, one of the barriers to planning for SLR is the inflexibility of current planning controls. This was recognised by all the key informants from local and state government, as captured in the following perspectives of a local government officer:

The way that we plan things needs to become a lot more flexible, on the one hand we need firm guidelines and guidance, saying build here yes or no, this is how you do it. On the other hand, we need to become more agile about how we think about planning and responding to hazards and that’s a very difficult space to be in (O3).

Another officer put it more succinctly, that “it’s going from a static perception of a place to this really dynamic place that’s changing” (O2).

Some other barriers to adaptive governance within the current planning system were identified by a key informant from state government, noting that development consent is granted in perpetuity; and, similarly, sea level rise benchmarks are a blunt instrument that don’t account for the life and size of the infrastructure (SO2). So, introducing more dynamism into the planning system could be achieved through: *time-bounded or trigger bounded development consent* (SO2); development frameworks that identify *different adaptation pathways* and change as modelling and human values change (O3); and a *probabilistic and risk-based approach* to planning, for example, considering that “there is a 20% chance that sea level rise will be more than 0.9m, is that acceptable for what you’re planning?” (SO2).

Significantly, a key informant from local government (O3) called for planning reform, by making the point that improving the planning system goes beyond just planning for sea level rise and that a single-issue focus may have the effect of missing out on other issues that are important like bushfires and biodiversity. This point resonates, as the risks of climate change interact with each other, and other sources of change, such as economic, political or societal change. Therefore, a starting point for climate change adaptation should be to improve on the present-day capacity of society to adapt and to be resilient (Tompkins and Adger, 2004), including reducing present-day social vulnerability. Similarly, a state government key informant raised the issue that several disaster response enquiries have recommended shifting from emergency response to preventative planning and mitigation, “each recommendation has been the same, that we’re on a pathway that’s completely unsustainable” (SO1). Thus, taking a wholistic approach to planning that considers multiple risks is one of the key challenges of climate change.

These thoughts on adaptive and preventative planning are also reflected in the perspectives of other interviewees (H4, H5, A2). For example, a key informant from a local Aboriginal organisation stated, it would be a disadvantage to allow “more buildings to go up in an area when it’s already been identified as a flooding risk” (A2). These comments were supported by a state government officer, “you don’t want to create future legacy issues by approving development that you know might eventually come under threat” (SO2). Householders and government officers supported the idea of using planning controls to prevent future harm to people, property and the environment. Greater flexibility and dynamism in the planning system would provide more options for reflecting climate change in planning controls.

4.5 POLITICS OF SEA LEVEL RISE

In Australia, climate change has been a highly politicised issue, that has both shaped and been shaped by Federal election cycles, changes in government and party leaders (Christoff, 2010, 2013; McDonald, 2015). National climate policies have been dominated by economic considerations and remain inadequate to the task of combatting climate change, and political and media institutions have not strongly recognised the authority of climate science (Christoff, 2013). Similarly, sea level rise is a highly controversial topic, as raised by key informants from local and state government (O1, SO1, SO2). Decision-making that takes SLR into consideration suffers from changes in government and self-serving, political decision-making.

The controversy surrounding SLR is illustrated by media interest in and the way the media portrays SLR issues. A media analysis examined articles referring to the subject “sea level” in 12 NSW coastal newspapers from 2009 to mid-2017. Figure 8 shows the total number of articles on SLR during this time in the selected newspapers. Almost 700 articles featured the subject of sea level and the highest number of articles (over 250) were featured in the *Newcastle Herald*, a daily newspaper which covers the Hunter and Central Coast regions (which includes Lake Macquarie). The second highest number of articles (152) were featured in *The Sydney Morning Herald*, which is likely to be a function of the size of the urban coastal settlements in both regions. A selection of fifty articles in the *Newcastle Herald* and *The Sydney Morning Herald* were examined, the types of articles written were primarily report-style (37 in each newspaper), followed by editorials and comment pieces (seven in *Newcastle Herald*, nine in *The Sydney Morning Herald*). This illustrates that there is more focus on single-issues than deeper analysis exploring the complexity of SLR and its impacts.

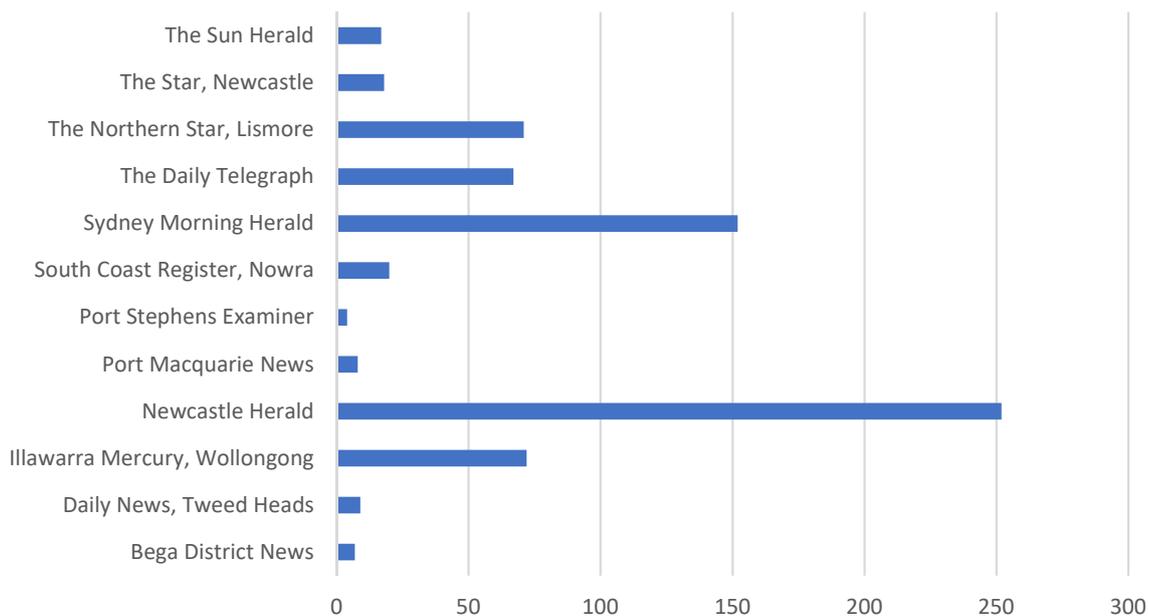


Figure 8 Number of articles on sea level rise in newspapers from 2009 to mid-2017

The number of articles in 4 large daily newspapers on an annual basis from 2009 to mid-2017 are shown in Figure 9. This figure illustrates how media interest in SLR has changed over time. In the *Newcastle Herald*, a high number of articles were featured in 2013 (49) and this peaked in 2014 (54), which coincides with the preparation of the *Planning for Future Flood Risks: Marks Point and Belmont South Local Adaptation Plan* in 2013 and a king tide that occurred in January 2014, which affected low-lying areas of Newcastle and Lake Macquarie. The number of articles in *The Sydney Morning Herald* were high in 2009 (26) and 2010 (22), coinciding with the introduction of NSW Sea Level Rise Policy. During this time, an article about the vulnerability of Lake Macquarie to rising sea levels was featured in *The Sydney Morning Herald* carrying the headline, “Waters Keep Rising, and so does worry” (14 November 2009) (Hawkins, 2009). Another high point of coverage for all four newspapers occurred in 2015, when the United Nations Framework Convention on Climate Change Conference of the Parties (COP 21) was held in Paris.

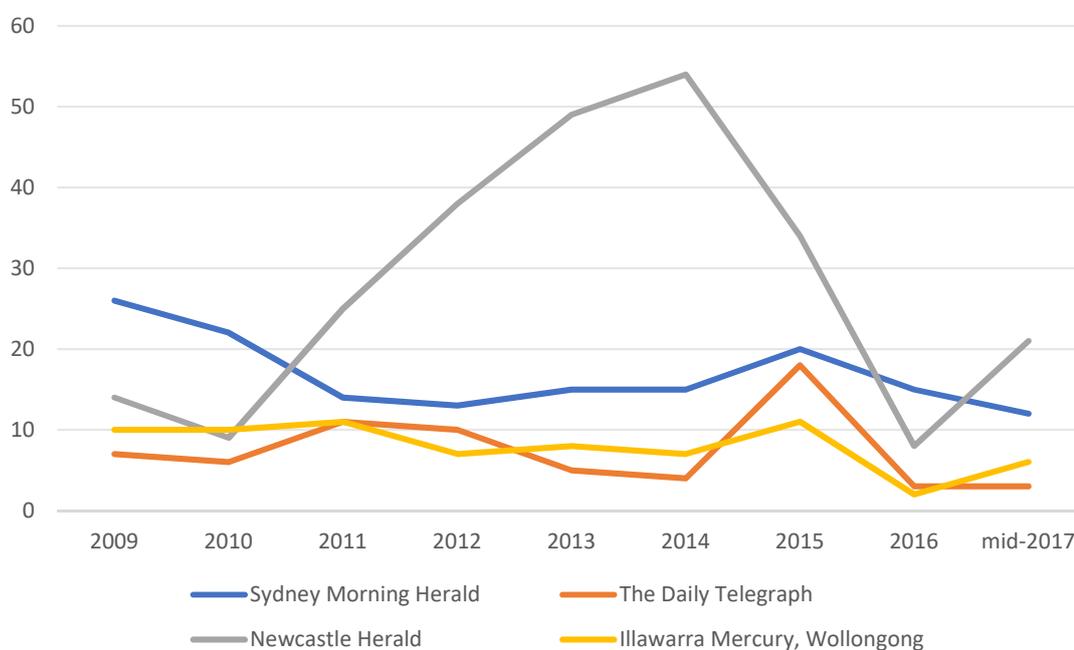


Figure 9 Number of articles on sea level rise in 4 coastal NSW newspapers from 2009 to mid-2017

A selection of headlines featured in Newcastle newspapers over the years is shown in Table 9. These headlines and synopses highlight the sense of controversy surrounding the topic of SLR. It highlights the way some politicians, developers and residents have used the media to actively generated this controversy, for example: *Sea rise estimates queried* (Cronshaw, 2015); *Speakers reject sea rise outlook* (Cronshaw, 2012b); and *Retreat is not an option* (Cronshaw, 2014). A key informant from the community working group explained, “One of the tools that Lake Macquarie coastal residents and the community groups use is the media to get public support” (K11). The media is used to generate support, to create controversy and to control messages. These messages have focused on

questioning SLR projections, and highlighting the impacts of SLR on private property values and development rights.

Table 9 Newcastle newspaper headlines on sea level rise

Headline	Synopsis
<i>Speakers reject sea rise outlook</i> (1 February 2012)	A community meeting called by a prominent businessman to hear researchers, including Professor Ian Plimer (a well-known climate sceptic), speak about their doubts about climate change predictions (Cronshaw, 2012b).
<i>Sea-level concerns overruled</i> (28 February 2012)	Lake Macquarie councillors approve a medium-density development at Marks Point, overruling council staff who had recommended refusal because of sea level rise (Cronshaw, 2012a).
<i>Retreat is not an option</i> (8 September 2014)	Marks Point and Belmont South residents demand state and federal government funding to defend properties against sea level rise (Cronshaw, 2014).
<i>Sea rise estimates queried</i> (24 March 2015)	Report on Liberal Councillor calling on Lake Macquarie Council to reduce its “controversial projections” (Cronshaw, 2015).

Another theme in newspaper articles is the reporting of local planning and development decisions where council staff recommendations for a development decision are overruled by a Councillor vote. For example, *Sea level concerns overruled* (Cronshaw, 2012a). This issue was also raised by householders and key informants, with one female householder saying, “you get a bit cynical about the reasons people make decisions and how they can be swayed in their decision by lobby groups” (H4). Another interviewee, representing a local Aboriginal group, stated, “My concerns are that they’ve got to make all development opportunities equal for everyone, not just certain people... We’ve had a block that you couldn’t develop and we’ve sold it and then all of a sudden there’s a big development on it” (A1). When decision making about developments affected by SLR is inconsistent or perceived as lacking transparency it erodes trust, which is key to just decision-making processes.

4.6 CONCLUSION

Governance and political factors have an overarching influence on the social justice dimensions of planning for SLR. This can be demonstrated through the uncertainty created by changes to state government policies, the inability of the current planning controls to adequately respond to the challenge of SLR, and the political controversy that surrounds the topic, which impact on the legitimacy of decisions and impede adaptive governance. The changes to the State government's approach to planning for SLR has pushed responsibility for SLR policy and planning to local governments. Yet, the lack of local government resources is a key challenge in planning for SLR (Few, Brown and Tompkins, 2007; Abel *et al.*, 2011; Measham *et al.*, 2011; Macintosh, Foerster and McDonald, 2015) and, in particular, local councils require leadership and support to address difficult social justice questions (Hayward, 2008). Across all levels of government, responding to the challenge of SLR requires strong political will and an adaptive governance approach (Bronen and Chapin, 2013; Hino, Field and Mach, 2017). This is complemented by leadership at the national and state level and clear overarching guidelines (Macintosh, Foerster and McDonald, 2015), such as the establishment of principles to guide greater flexibility in the planning system.

Fundamentally, governance factors in NSW have eroded certainty, accountability and trust, through removing policy guidance on SLR, and shifting responsibility to the smallest scale and least resourced tier of government. In addition, trust is eroded as political self-interest undermines evidenced-based decisions at all scales of government.

Chapter 5 Procedural justice: recognition, participation and power

My concerns are that they've got to make all development opportunities equal for everyone, not just certain people. (Key Informant)

5.1 INTRODUCTION

Governance approaches influence procedural justice factors as an unclear, unstable and politicised governance approach can make it difficult to engage with the community, due to the perception of a lack of transparency or legitimacy. Procedural justice is concerned with the process of planning and decision-making, and includes recognition, participation and the distribution of power (Paavola and Adger, 2006). My analysis of procedural justice in the case study is structured around these three dimensions, seeking to identify power imbalances which can reduce recognition and participation, as well as, identify opportunities for improved procedures. In a normative sense, just planning processes should provide inclusive recognition and participation, allowing all people affected by a decision the opportunity to participate. Timing is an overarching factor that influences levels of participation, recognition and power in planning processes. This chapter explores themes of: recognition and participation, power, and timing.

5.2 RECOGNITION AND PARTICIPATION -WHO IS INCLUDED/EXCLUDED?

Procedural justice includes: recognition – whose interests are recognised; representativeness - who is participating, who is included and who is excluded; distribution of power - how much power do participants have; and what are the rules of the process (Paavola and Adger, 2006; Paavola, 2007; Lukasiewicz *et al.*, 2013). These issues will be explored in relation to LMCC's local adaptation planning process for SLR. Local Adaptation Plans (LAPs) are suburb specific studies on the risks and options for potential sea level rise (Stevens *et al.*, 2012). It is appropriate to begin by recognising that the local adaptation planning undertaken in LMCC is unique and exemplary. A key informant from local government best describes this approach:

The collaborative model that we've adopted is...people that have a stake, who are at the front line of what's happening, need to be involved and we shouldn't be making decisions for them; they need to be part of the conversation. I think that's just part of a democratic society (O3).

So, how does the local adaptation planning process address the elements of recognition and participation in procedural justice? Table 10 describes the process of developing the *Marks Point and*

Belmont South Local Adaptation Plan in relation to the elements of procedural justice, it highlights the inclusive and egalitarian nature of the process, the variety of ways that people could participate, and the availability of information online to everyone (not just active participants). However, as recognised by two local government key informants (O1, O3), the process should be recognising residents and property owners who are not in the at-risk areas, “so that we can get that conversation happening...if we have to pay for anything what’s the cost on the broader society” (O3). Recognising the interests of all residents helps to increase the legitimacy of planning outcomes and avoid unintentional impacts on other residents, such as financial hardship if rates are increased, reduced access to public land or unacceptable impacts on the natural environment.

Table 10 Participation and recognition in developing a Local Adaptation Plan

Elements of Procedural Justice	Marks Point and Belmont South Local Adaptation Plan process
<i>Whose interests are recognised and how?</i>	Residents of flood-affected areas all around the lake, Councillors, and agencies attended initial workshops to design the collaborative process (LMCC, 2016e).
<i>Who is participating and how?</i>	Residents of Marks Point and Belmont South, Council staff, Councillors, property owners, businesses, and service providers, over a two-year period. A Community Working Group of 30 people started work on the plan together, however a Sub-Committee of 11 members co-developed the plan with Council staff (LMCC, 2016e).
<i>Who is included/excluded?</i>	All residents and property owners of the two suburbs were invited to initial workshops (LMCC, 2016e) and anyone was welcome (Key Informant), information about the project was available online, and the draft plan was on public exhibition for 60 days. Residents and property owners who are not in the at-risk area are not actively included (Key informant).
<i>What is the distribution of power?</i>	A Sub-Committee co-developed the plan with Council staff (LMCC, 2016e).
<i>What were the rules of the process?</i>	The principles were: all members of affected communities should be given the opportunity to be involved; activities should include local workshops, regular newsletters and surveys, and on-line access to information and forums; and expert advice should be available to all participants (LMCC, 2016e).

As illustrated in Table 10, participation in the LAP process is open to everyone, however the Sub-Committee of 11 residents who co-developed the plan were self-selected, and it was this group of

residents and Council staff who had the greatest influence on the plan. However, LMCC went to considerable effort to involve a diversity of participants. This was noted by one key informant, a female householder, “I feel that they’ve gone out of their way to get people involved, but that’s a problem of getting the message out there, I think this is a great Council, they are concerned about these issues.” (KI4). Despite this, the process has skewed recognition, participation and power towards the local residents in the at-risk area, and has not recognised residents outside of the at-risk areas. As noted by Hayward (2008) and Clément, Rey-Valette and Rulleau (2015), it is likely that the adaptation preferences of residents in at-risk areas favour protection of private property and this concern is not necessarily matched by residents who do not live in the at-risk areas.

Another restrictive factor in the LAP process is time, through the observation of the Community Working Group meeting it is apparent that the individual’s availability to contribute their personal time is a key factor in participation. A key informant from a local Aboriginal group noted, “I was on that committee, but with my job I can’t make all those meetings. When I can I will attend them” (A1). So, it’s likely that the localised and time-intensive nature of the LAP process, and self-selection of participants, has resulted in a participatory process that is not representative of the socio-economic demographics of the Lake Macquarie LGA and skews power towards the residents of the at-risk area.

Personal Reflections on the Local Adaptation Planning Community Working Group meeting

The meeting that I observed had an interesting power dynamic, and it was important that an independent facilitator was present to ensure the smooth running of the group. Some members of the group tended to dominate and lead the discussion and the facilitator was able to manage this dynamic and draw-out opinions from all group members. The demographics of the members attending included men and women in the over 60s age group only.

The Council officers present were careful to limit their active participation in the group, making space to listen to the community members.

5.3 INFORMATION AS POWER - IS THERE AN IMBALANCE?

The theme of power through information and knowledge emerged from the interviews and media clippings in two divergent ways: some actors identified that information about SLR is economically damaging to their self-interests and should not be released, and others thought more information should be “out-there” about SLR projections and impacts. A local government officer identified that the community were outraged that council was talking about how SLR will affect their homes, and acknowledged an attitude exists that “the science is wrong, you don’t know what you’re talking

about, you bloody idiot, go away...” (O1). This theme was also evident when council put notations on Section 149 Certificates³ on some properties to say they are flood prone:

a lot of landowners say that’s unfair [that] you’re putting a notice on my property, because it’s going to reduce my ability to sell it.... But council also has a responsibility to people that want to buy property, [to tell them] that they are going to buy property that is flood affected (O2).

The idea that information about SLR should be kept quiet is motivated by a desire to protect property values and investments, as illustrated by newspaper headlines *Sea rise may drop values* (Cronshaw, 2010) and *\$1billion 'going under'* (Cronshaw, 2013). In some cases, it was indirectly suggested that information may be contained in the future, as expressed by one householder on the community working group “if it looks like it’s [rising sea levels] going to come in ten years then they [should] sell up and move, but then that’s a bit unfair to the next person who hasn’t kept up with the local area” (KI2). This power imbalance is partly due to the planning process whereby householders who are not living in at-risk areas are not recognised as ‘stakeholders’ in planning for SLR. Keeping SLR information contained and questioning the validity of SLR projections (see *Speakers reject sea rise outlook* in Table 9), denies access for all to information that is essential to making sound judgements about adaptation (Garnaut, 2011). The implications of containing and questioning SLR information are significant, as it stifles open communication about SLR, delays action and preferences protective measures over others, which has wider implications for the level and type of burden placed on future generations in responding to SLR.

In contrast, the view that it is important to put the facts “out-there” was reflected by several key informants and householders (H3, H4, H5, H6 KI3, A2, SO2) as “the quicker you start education the better; talking about it, giving some example of what could happen, preparing people is better” (H4). And, “my personal view is the right to information should be foremost” (SO2). For some key informants and householders having access to information about SLR has already influenced their decisions. For example, “I even thought if I do down-size I would move somewhere higher, it just makes sense to me” (KI5). This example highlights the important role of Section 149 Certificates in making information about coastal hazards available to property buyers, to ensure they are aware of potential risks prior to making purchases. Potential property buyers can purchase two planning certificates, 149 (2) and 149 (5), to gain access to information about development controls, as well as, other relevant matters affecting the land which are not yet included in a local environmental plan, development control plan or policy (NSW DPE, 2014). Unfortunately, in cases where warnings

³ Section 149 Planning Certificates provide information about zoning, permissible and prohibited land uses, exempt and complying development, controls for development or hazards, such as heritage, coastal protection, bush fire, contaminated land and flooding.

relating to potential climate change impacts were included in 149 (5) certificates, backlash from interest groups has resulted in the withdrawal or modification of this information and subsequently the NSW Government intervened to limit what information may be provided and in what circumstances it may be included (Macintosh, Foerster and McDonald, 2015).

The issue of access to SLR information is summed up nicely by a key informant from state government, who noted that, "It's certainly been hugely controversial - the debate about the right to information versus the impact on property prices - against a backdrop of scepticism on the science" (SO1). Despite the potential impacts on property values, addressing the power imbalance created by containing and questioning SLR is of foremost importance to achieving procedural justice. Local and state government already have a public responsibility to make information about SLR available, however, it is largely available in formats that are difficult to access such as planning certificates, planning documents or technical studies. Therefore, information about SLR projections and impacts should be regularly updated and made freely and publicly available in simple and accessible language, as was the intent of the NSW Chief Scientist and Engineer's original recommendations, see Table 7.

5.4 TIMING

Timing is another important factor affecting procedural justice and a crucial element in planning for rising sea levels, as the issue raises many time-dependent questions: When should we act? How do we consider intergenerational concerns? Moreover, harmonising current activities with short-term and long-term adaptation is an extremely difficult task, requiring detailed analysis and modelling in most situations.

Several householders expressed the view that starting early and planning-ahead for sea level rise is the better approach (H1, H2, H4, K11). This approach is reflected in the document analysis, for example, the *Marks Point and Belmont South Local Adaptation Plan* identifies planning ahead as an essential strategy (LMCC, 2016e), and the *Draft NSW Coastal Management Manual* prescribes that Coastal Management Programs recognise longer-term issues and opportunities and foreshadows future risks, risk management responses and decisions that will need to be made (NSW OEH, 2015). In addition, national and international economic reviews of climate change have found that the costs of climate change will be lower if adaptation action is taken sooner rather than later (Stern, 2007; Garnaut, 2011). The creation of a LAP for Marks Point and Belmont South created more certainty for current residents and avoids placing the burden to act quickly on future generations (O4). So, planning-ahead addresses procedural justice in allowing time for inclusive participation, as well as, the distributive justice concern of intergenerational equity.

The dilemma of weighing-up current concerns with future risks was raised by key informants from the community (KI1, KI5), and a key informant from local government suggested that there was generally a difference of opinion over when to act on sea level rise. The perspective of council officers being that action should be taken now to reduce future risk, and in contrast, householders and business owners perceived that nothing should be done until there is an imminent problem (O4). Similarly, other studies have found that many home owners will be more concerned about impacts on property values than the risk of inundation in future decades (Fincher, Barnett and Graham, 2015; Gibbs, 2016). Despite this dilemma between current concerns and future risks, one key informant from state government suggested a way to look at short-term and long-term planning as, “differentiate between dealing with your existing problem and not making it worse” (SO1). For example the *Lake Macquarie Development Control Plan, Section 2.10 Lake Flooding and Tidal Inundation (incorporating sea level rise)* identifies the objective to avoid the creation of new lots for residential, commercial or industrial development on land likely to be flood affected (LMCC, 2017b, p11). Thus, demonstrating an important principle of adaptation planning, i.e. avoidance, or not making the problem worse for future generations.

5.5 CONCLUSION

Realising procedural justice depends on addressing inclusive recognition and participation, restoring power imbalances, and appropriate timing. Participation and recognition were largely addressed through the LAP process implemented in Lake Macquarie, participation in the process was open to all, but the process failed to fully recognise householders who are not directly affected by SLR. These residents will bear some of the burden of the planning outcome and should be included in the planning process, as discussed in a case study of perceptions on equity and responsibility in the coastal zone in the south of France (Clément, Rey-Valette and Rulleau, 2015). Therefore, as found by Hayward (2008), when community engagement in decision-making is restricted it can become focused on private property rights rather than improving procedural justice.

Procedural justice is also concerned with the distribution of power in the process of decision-making (Paavola and Adger, 2006), and in the case study area the affected residents, developers and investors appeared to hold onto power through controlling or questioning information, by using the media these groups were able to focus on how SLR will affect private property, rather than its other local impacts. This outcome is also a factor of the localised nature of the planning process, as public interventions to protect private property are strongest at the local and short-term level (Cooper and McKenna, 2008). Despite these issues, developing a plan to address SLR in the Lake Macquarie area is a significant achievement, as described by a key informant from state government:

When they started that process, the community was in a very negative space and they have very successfully brought the community around...The fundamental position is that facilitating adaptation of those communities that are there has to be a great win. They have had a big win in terms of getting the community on-board in a pretty dismal space (SO1).

Through the process of engaging with the local residents in an open and collaborative way, the procedure has influenced the legitimacy of the adaptation decision (Paavola and Adger, 2006), as described by a local government officer:

because it's been collaborative...you build ongoing political good will and stability in the area, if a member of the community presents a plan to a bunch of councillors they're much more likely to say continue doing this in this way (O1).

Timing also has significant procedural justice implications; timing affects who can be involved in the planning and how much power they have, and the impact of those decisions on future generations. Many interviewees supported the idea of planning ahead because of the benefits that brings to present-day and future communities. Another key temporal issue was the dichotomy between future risks and current concerns, however, these concerns need to be considered in relation to the principle of intergenerational equity.

Chapter 6 Distributional justice: valued places, moral values and retreat

Ultimately these are all social problems, you're talking about real communities. It's going to be a massive adjustment, adaptation isn't [an] option, you'll adapt whether you want to or not. (Key Informant)

6.1 INTRODUCTION

Distributive justice relates to the distribution of benefits and costs between people and across time (Adger, Paavola and Huq, 2006). Distributional justice outcomes are informed by various underpinning principles such as *utilitarian*, *redistributive*, '*luck egalitarianism*' or *responsibility*, *libertarian* and *efficiency*. In the field of climate change adaptation the *redistributive* principle of 'putting the most vulnerable first' acknowledges existing inequalities and sets out to prevent future inequalities (Adger, Paavola and Huq, 2006; Dow, Kasperson and Bohn, 2006; Graham *et al.*, 2015). In the case of local planning for SLR, defining who is the most vulnerable isn't clear-cut, as the people living in the most physically vulnerable waterfront locations are often very affluent. However, in the Lake Macquarie area, houses that will be affected by SLR are not only the waterfront properties, the at-risk areas include a diversity of socio-economic groups, particularly retirees.

As such, there are complex definitional issues here that require clarification in relation to just planning for SLR. Interviews with householders and key informants sought to find out how they defined distributive justice. I will explore these understandings of justice by highlighting what people reported as valuing about where they live, interpreting what their moral values might be and describing their approaches to defining who should bear the cost of SLR.

6.2 VALUED PLACES

Clearly identifying the values held within a community can assist when conflicting and competing values become barriers to climate change adaptation, as referred to in Chapter Two. Moreover, addressing values specifically may improve the legitimacy of planned adaptation actions (Wolf, Allice and Bell, 2013), and legitimacy is key to minimising conflicts and gaining support for adaptation actions. In the Lake Macquarie area, whole suburbs are at-risk from SLR, therefore it is important to understand the place-based values of these communities and identify adaptation actions that seek to preserve these values.

The 11 householders interviewed were asked about what they value about the Lake Macquarie area, almost all (10) responded with reference to the natural environment (five), the lake (seven), and/or the ocean and beaches (four). Householders also value their proximity to city centres (eight) and other features, as shown in Figure 10. Householders spoke enthusiastically about their appreciation of the Lake Macquarie area, for example “I’ve travelled the world and been to a lot of great places, but none of them have been better, there’s some equally, but as far as resources, natural resources, with the beaches, the lake...” (H1), illustrated by a photo of the lake Figure 11. These place-based values expressed by householders are reflected in the community values described in the *Draft Lake Macquarie Community Strategic Plan 2017-2027* (shown in Figure 12), which also included the unique landscape, where the natural environment (bushland, coast, lake and mountains) is protected and enhanced (LMCC, 2017a, p8).

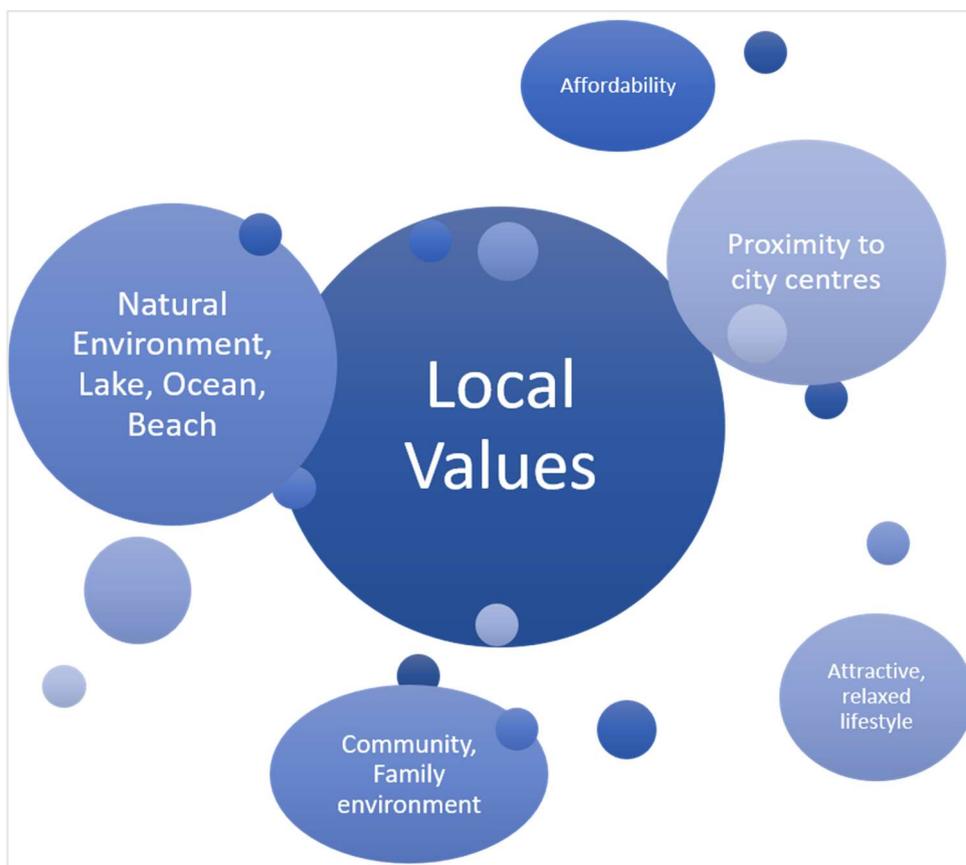
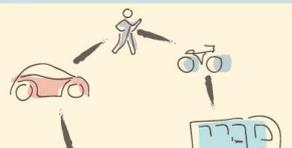


Figure 10 Local values expressed by householders⁴

⁴ Note size is only indicative of how often a value was mentioned.



Figure 11 Photo of Belmont Wharf on Lake Macquarie

<h2>OUR VALUES</h2> <p>Lake Mac's new City Vision and set of Community Values, developed by the community in 2016, will guide future planning and provide direction for how the City responds to change and growth. This new direction reflects the priorities of our residents and will shape policies and plans prepared by Council, including this plan.</p>	<p>We value a DIVERSE ECONOMY</p> <p>which is resilient and adaptable to change, making the best use of the unique advantages of our location and lifestyle.</p> 
<p>We value our UNIQUE LANDSCAPE</p> <p>a place where the natural environment (bushland, coast, lake and mountains) is protected and enhanced; where our existing urban centres are the focus of our growth, maintaining their unique characteristics.</p> 	<p>We value CONNECTED COMMUNITIES</p> <p>that support and care for all and provide a sense of belonging.</p> 
<p>We value LIFESTYLE AND WELLBEING</p> <p>a place that encourages safe, active and social opportunities.</p> 	<p>We value CREATIVITY</p> <p>working together with creative process and outcomes that bring together history, culture, knowledge and expertise that supports new technologies and ways of thinking.</p> 
<p>We value MOBILITY AND ACCESSIBILITY</p> <p>effective transport systems that provide choices to conveniently move people, goods and services.</p> 	<p>We value SHARED DECISION-MAKING</p> <p>Lake Macquarie communities continue shared responsibility for governance.</p> 

Source: LMCC (2017a, p8-9)

Figure 12 Local community values from the Draft Lake Macquarie City Community Strategic Plan 2017-2027

6.3 INTERPRETING HOUSEHOLDERS VALUES

The term 'values' can also refer to moral principles, rather than values assigned to a specific thing or place (Dietz, Fitzgerald and Shwom, 2005). Exploring the diversity of values in a community is useful

in decision-making, as values are assumed to influence both priorities and preferences about how decisions should be made (Dietz, Fitzgerald and Shwom, 2005). One of interviewees, a key informant representing a local Aboriginal group, spoke about values and beliefs and how they affect the way Aboriginal people understand and respond to climate change:

We talk about climate change all the time. I don't call it climate change, I just call it mother nature. Mother nature's got its own course, it will tell us what it wants, not us tell it what we want. It's been like that for thousands of years, that's how the Aboriginal people look at it, we believe in mother earth. Things happen and we say well it's happened, what can we do about it it's the life cycle isn't it.... The old people look and they see something happening and they say, this is it the gods have spoken, their spirits are answering us that they are doing something different and it happens like that, and it's one of the things that we've got to face in our lifetime (A1).

The beliefs and values expressed by this key informant, illustrate an adaptive perspective on climate change.

The values discussed by householders and key informants in relation to SLR can be interpreted and broadly represented by two dimensions: concern for property versus concern for people; and defensive versus diversified measures, as shown in Figure 13. These dimensions give rise to four value categories, however individuals may have expressed opinions or concerns that stretched across more than one of these categories. Some examples of comments that fall into these categories are shown in Table 11.

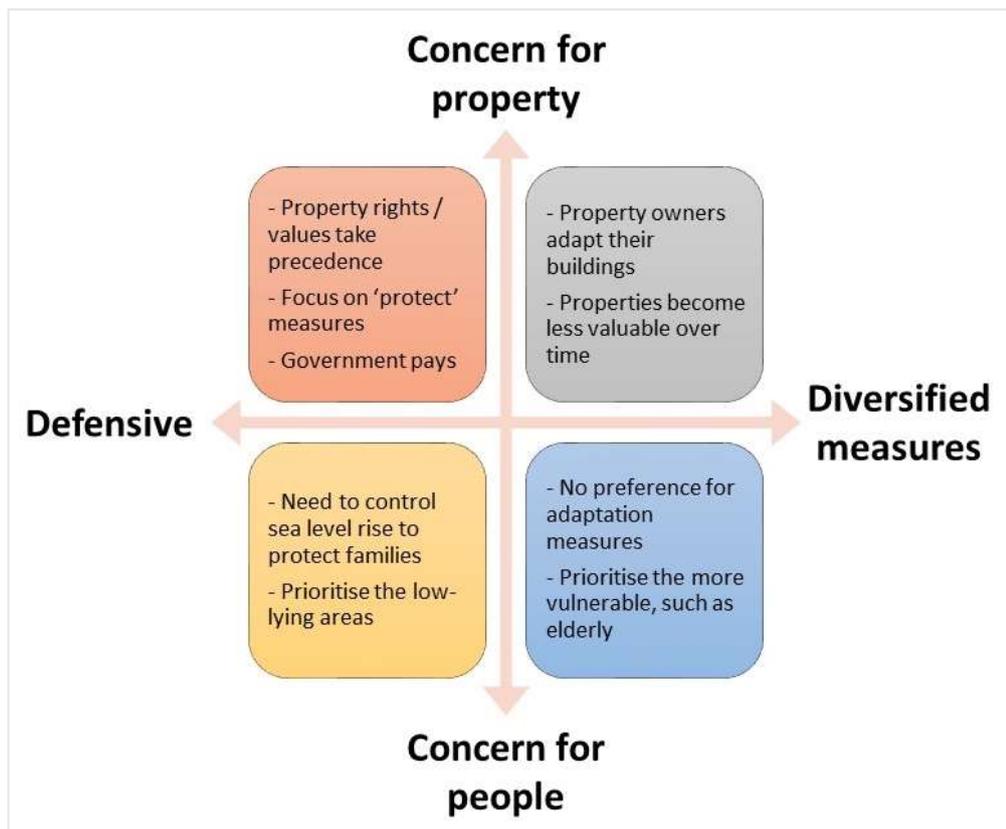


Figure 13 Some of the principles expressed by informants mapped against two dimensions of values

Table 11 Illustrations of comments that represent four types of values.

<p>Concern for Property & Defensive measures</p> <p>“We have to defend this [lake] entrance vigorously and the cost is not a householder thing, it’s a government thing” (K11)</p> <p>“When you start having discussions with these landholders the mantra is <i>retreat is not an option</i>” (SO2)</p>	<p>Concern for Property & Diversified measures</p> <p>“They [property owners] can adjust, they can put another storey on their house, elevate the actual house” (K13)</p>
<p>Defensive measures & Concern for People</p> <p>“They would be the priority the ones on the low lying areas because they are going to be affected immediately, and they should be looked after and there should be a plan in place because a lot of them would have invested in their homes” (A2)</p>	<p>Diversified & Concern for People</p> <p>“If people have to be relocated... socially it’s going to wreck people’s lives because they will be divorced from their communities, especially older people” (K14)</p>

Defining these two dimensions is a way to interpret the hidden values discussed in the interviews, and it provides a frame for explicitly discussing the moral values and principles that influence

decision-making about SLR and adaptation measures. Furthermore, articulating these hidden values illustrates where there is conflict and highlights the need for overarching principles to guide decisions and identify the most legitimate distributional outcomes. Hence, the underpinning principles of distributional justice, discussed in Chapter Two, become relevant and informative. In particular, the principle of '*Luck egalitarianism*' or *responsibility* seems key to resolving this value conflict. '*Luck egalitarianism*' is based on the principle of responsibility and recognises people's level of responsibility in making choices (Clément, Rey-Valette and Rulleau, 2015). That is, it considers if people knew about the risk of SLR when they purchased their property. If properties were purchased in the last 20 years, the vulnerability of low-lying coastlines to climate change was known (IPCC, 1995), and therefore, property buyers had an awareness of the higher risks in coastal locations. It is possible buyers considered that the benefits of living near the coast outweighed the risks of climate change. So, the timing of property purchases or council approvals for new developments, is key to the principle of responsibility and subsequently distributional outcomes.

6.4 DISTRIBUTIONAL EQUITY –DECISIONS, OUTCOMES AND PREFERRED RESPONSES

Distributional justice is essentially about who pays or who bears the cost of adaptation actions. Interviewees had many different actors in mind when they considered 'who pays', as described in Table 12. The identification of responsible actors can also represent an approach to distributive justice that can be described by underpinning principles, such as *libertarian*, *utilitarian*, *efficiency*, *redistributive* or *luck egalitarianism*, as illustrated in Table 12.

Table 12 Different actors who could 'bear the costs' of sea level rise

Who pays, who bears the cost	Example Interview Quotes
<i>The government - federal, state or local (Libertarian, Utilitarian)</i>	"The message was climate change is happening, it's a global issue, it is being contributed to by everybody, therefore everyone can pay for the solution, that became the new mantra" (O1)
<i>Future owners (Efficiency)</i>	"... if you've got a house that is going to be flooded once in every 20 years, then I think there would be a lot of people who would buy that house and live in it and yes, poorer people, but they would continue to use it" (K13)
<i>Directly affected (Efficiency, Beneficiary-pays)</i>	"It could be the people in flood prone areas pay an additional rate" (H6) "Who actually benefits from this strategy? It might be house raising or whatever, they should be the ones that pay" (SO2)
<i>Those that can afford it, and assistance is provided to those who cannot afford it (Redistributive)</i>	"So people living there ... they may not have anything, they might be living on the pension, so what happens to those people, I want them looked after first, because there would be a lot of people in my situation that can afford to do something or think about it early enough to do something" (K12)
<i>People who were warned of the risks (Luck Egalitarianism)</i>	"From my point of view, you've chosen to live there with the knowledge that this can happen" (H2)

In identifying who should pay it was the directly affected that more often suggested the government should pay and it was those who are not living in an at-risk area who suggested that the directly affected should pay. However, there were exceptions to this observation, for example a female householder from a low-lying area identified that people who are less able to afford to adapt, particularly the elderly and long-time residents, will need more assistance than others (K12). This comment reflects the principle of *redistributive* justice where the most vulnerable should be prioritised (Paavola, Adger and Huq, 2006). Additionally, an interviewee suggested an *efficiency*-based approach where future owners should bear the costs, however, he also highlighted an important point, that if people have purchased low-lying coastal property because of its affordability, how do we ensure these people are not further disadvantaged? This question points to the need for multiple guiding principles in determining distributive outcomes, which will be discussed in Chapter Seven.

Willingness to pay for adaptation options was dependent on what the cost was for; the directly affected were much more likely to pay for an adaptation action that protects or accommodates private property. For example, “most of the people on the waterfront, want to contribute to defending their own property, and that’s the way the Marks Point Adaptation Plan is drawn up” (K11). However, if the cost was planned retreat, then the directly affected wanted to receive full compensation, see Table 9 - *Retreat is not an option* (Cronshaw, 2014). These views align with the principle of *beneficiary pays*.

The sorts of adaptation actions that householders preferred most were protect and accommodate (K14, K12, K13), with planned retreat being the last option, “I’ve always thought protection is the first thing...to me the last thing is retreat if you have to...” (K12). Interestingly, considering the high local values for the natural environment there were very few householders that mentioned the impact that adaptation measures like protect could have on natural landscapes and ecosystems, including access to beaches. Although one key informant discussed these issues, “Large things like sea walls I hope I don’t see it, I don’t think I will, I don’t have an answer ... [but] I wouldn’t live here, it wouldn’t be a lifestyle for me” (K15). This attitude reflects coastal legislation and the strong cultural norm of beaches being accessible to all (Voyer and Gollan, 2017). The adaptation preferences of those with technical knowledge of the options were divergent, local government informants opted for a combination of different approaches for different situations and scales (O1, O2, O3). Whereas, state government key informants identified that, “in the face of accelerating sea level rise [the sensible option is planned retreat], because a lot of the options have very significant costs and are not necessarily long-term solutions... In the short-term there will be a level of accommodation and protection but that may not be feasible in the long term” (SO2). The difficult distributional problems associated with choosing adaptation options, will be easier to tackle if they are broken down to explicitly identify: what are the impacts of the approach, who benefits and what principles underpin preferences for different adaptation approaches.

6.5 THE OPTION OF PLANNED RETREAT

Planned retreat is a ‘hot potato’ in addressing SLR. At the political level there is a huge reluctance to speak about it. However, from a technical and environmental perspective planned retreat is a preferred adaptation option. This chapter describes how planned retreat was discussed with householders and key informants to explore: what householders think planned retreat involves, and what factors could make planned retreat more socially just.

In interviews with householders and key informants, two scenarios were used to explore possible approaches to planned retreat, see Appendix E, Scenario 1 describes a ‘Wait and see’ approach, and Scenario 2 describes an ‘Anticipatory planning’ approach. The scenarios were useful to move people

away from the idea of planned retreat being forced, as discussed by a key informant from local government, “just using the words planned and managed retreat conjured up a vision of Council telling people that they could no longer live in their property, that they had to move and that we would be withdrawing servicing infrastructure in those areas” (O1). Planned retreat could be implemented in a variety of ways and, at this stage, there is time to plan it in a way that maximises social justice and better outcomes for communities. Of the two scenarios, householders and key informants almost all preferred the ‘Anticipatory planning’ approach as a more just or fair approach to planned retreat. However, it was noted the ‘Anticipatory planning’ scenario is idealistic and lacks consideration of economic realities:

It’s not realistic to think that government can actually purchase land, it’s more likely that transfer of development rights is the likely outcome, and identifying those areas where communities would be willing to transfer their development rights while staying in their property for as long as they want, is a better outcome, more realistic outcome and one that has been tried and tested in other places, these planning tools are in existence, they’re not necessarily tools that we [use] yet but they do exist as planning tools (O1).

A key informant from the Community Working Group felt that the ‘Wait and see’ scenario wasn’t really a retreat scenario and both scenarios were far too simplistic (K11). As an explorative approach the scenarios were effective in drawing out the factors that householders consider key to making planned retreat more just. Table 13 compares the factors discussed by householders and key informants, to the eight factors discussed in resettlement and climate change adaptation literature from Chapter Two.

Table 13 Factors that would make planned retreat better

Key Factors	Householders/Key Informants perspective on what would help make planned retreat better
1. Supporting policies and law	Use existing Floodplain Management Program as a policy guide (SO2). “There needs to be some regulations about demolition so that people don’t just move out and leave rotting houses for future generations to worry about.” (H5)
2. Government commitment to improve outcomes for communities	“You need high levels of committed leadership and coordination” (O2)
3. Avoid resettlement, explore alternatives and conduct baseline research	“And to me the last thing is retreat if you have to...” (KI2)
4. Long-term planning and consider appropriate timing	“It would have to be a very slow plan over time, because a lot of people would be reluctant, it would take time” (A2) “You don’t want everyone moving at the same time, a staged approach, and incremental [to] give you time” (H6)
5. Participation for all (including vulnerable people and host communities) and community consent (free and informed)	“It’s about the agreement, and the support, the working together” (H5)
6. Adequate compensation to allow resettlement on safer land	“I think there has got to be some form of compensation” (KI3) “Assuming you could get some carbon tax or something, some of that could be used to buy back land and return it to the coastal environment” (H5)
7. Move as a community and provide support	“I think that that’s a really powerful thing, when a whole community can make a decision together” (O1)
8. Dispute resolution processes	“I think you’ve got to have a sympathetic approach” (H4)

Householders recognised that if retreat is the only option, it’s better to be planned-ahead in a way that involves householders in the decision-making process. Planning would need to include post-retreat strategies for the area, such as demolition and ecological restoration, to enable the area to function as a resilient buffer against future coastal risks. Financial compensation was clearly an

important component of retreat and ideally this would be provided by the government, through a mechanism like a carbon tax, so the burden of responsibility is shared across society. However, key informants from government raised the possibility of market-based responses contributing to retreat over-time, through insurance costs going up and property prices going down, and the introduction of measures to share the financial burden, such as spreading losses across multiple owners, or time-limited development consents with movable dwellings (SO2, O4). Unfortunately, some approaches to risk spreading can also have perverse outcomes. For example insurance prices can provide a signal to the community about the level of risk, but increases in insurance premiums can lead to under insurance and non-insurance, which can then shift the responsibility for repair and reconstruction costs to individuals and governments, through assistance packages (CoA, 2015). However, spreading the cost across multiple landholders over time reduces the impact on individual landholders, and flexible planning controls can help to facilitate this approach.

6.6 CONCLUSION

Identifying and describing the distributional principles underpinning decisions is one way to break-down the challenge of planning for SLR. It is clear householders interviewed have a deep appreciation for the natural environment of Lake Macquarie, yet they hold divergent views on adaptation options, and who should bear the responsibility and cost for adaptation. By interpreting the householder's responses and positioning their thoughts within the two dimensions of concern for property versus people, and defensive versus diversified measures, it made it possible to loosely define the moral principles that inform their decisions about adaptation options and distributional outcomes. As discussed by Rulleau, Rey-Valette and Clément (2015), the householders tended to shift responsibility to different groups depending on their personal circumstances and willingness to pay was influenced by whether the intervention protected private property or not. When it comes to environmental costs, evidently there are value conflicts that could be resolved by a larger scale and longer-term analysis (Cooper and McKenna, 2008), which would highlight the environmental costs of adaptation options and the associated impacts for future generations.

So, considering that householder values are in conflict, how should adaptation proceed? Overarching distributional justice principles, such as *luck egalitarianism* (Clément, Rey-Valette and Rulleau, 2015) could be used to explicitly determine outcomes. However, there may be social vulnerabilities that exist within a community that are not addressed by the *luck egalitarianism* principle. So, inclusive recognition and participation of vulnerable groups is also key to informing distributive principles. A set of guiding principles will be discussed in Chapter Seven.

Of the different adaptation options planned retreat was the least popular, however, it was identified as the most suitable long-term solution because of the growing nature of SLR. The householders

interviewed identified many factors that could make planned retreat better, the most important being taking the time to plan-ahead and community participation in decision making. The factors discussed by householders were in-line with the recommendations made by resettlement and retreat literature in Chapter Two, highlighting the value of looking to these experience-driven sources for guidance on climate change adaptation.

Chapter 7 Conclusion: Principles for future planning

7.1 INTRODUCTION

The challenge of planning for an uncertain future has driven significant research on the biophysical and economic impacts of climate change. However, these studies do not directly inform our responses to climate change and SLR in terms of the social impacts, how people's lives will be affected, and how costs and benefits will be distributed (Cooper and McKenna, 2008; Graham *et al.*, 2014). Climate change impacts will be distributed unevenly across space and time, and social vulnerability to those impacts is differential (Adger, 2001; Paavola and Adger, 2006). Social justice is key to addressing climate change because of these differential impacts and the way costs and benefits of adaptation actions can exacerbate current social vulnerabilities (Adger, Paavola and Huq, 2006). On the coast, adaptation is particularly contentious because the costs and benefits of actions are shared between residents who are directly exposed to coastal risks and others who are not (Cooper and McKenna, 2008; Barnett *et al.*, 2014; Clément, Rey-Valette and Rulleau, 2015; Gibbs, 2016). Although coastal adaptation is focused on local impacts and responses, there is only a limited number of studies undertaken at the local-scale that consider distributional effects, equity and legitimacy. Examining local coastal adaptation through a social justice lens highlights some of the challenges associated with planning for future SLR and provides key learnings to inform future policy and practice.

7.2 KEY CHALLENGES OF JUST PLANNING FOR SEA LEVEL RISE

This research explored the understandings of social justice in planning for SLR and planned retreat held by different actors in the case study area. A range of understandings were explored by analysing data, which included interviews, observations of a community working group, planning documents and media articles, using a conceptual framework (Figure 4). As described in Chapter Two, the framework highlights that social justice is made up of procedural and distributive concerns, which are influenced by timing, governance and scale. Exploring and analysing the case study through this framework highlights some of the key challenges of just adaptation: limitations in governance and leadership; procedural inclusiveness and engaging disadvantaged communities; and articulating distributional principles.

In addition to exploring understandings of social justice, this research sought to identify: principles that can improve social justice outcomes in planning for SLR; and factors that influence social justice in planned retreat. This final chapter draws together the key themes and presents practical guiding principles to help decision-makers and planners navigate this complex challenge.

7.2.1 Addressing limitations in governance

Governance approaches influence social justice. Adaptive governance addresses social justice concerns by taking into account a changing and dynamic climate, in addition to social, economic and environmental conditions, through responsive, flexible and multilevel governance (Folke *et al.*, 2005; Few, Brown and Tompkins, 2007). In a normative sense, social justice is jeopardised by limited and inflexible governance, characterised by a lack of leadership and support from higher levels of government, variability in political commitment, devolution of responsibility, and constraints within existing laws and planning controls. Leadership and political commitment is swayed by incentives for political decision makers that favour the status quo (Macintosh, Foerster and McDonald, 2015). In this case study, the NSW government has shifted responsibility to the lowest tier of government, which is fraught with problems, including lack of resources and capacity to address SLR planning (Few, Brown and Tompkins, 2007; Hayward, 2008; Abel *et al.*, 2011; Measham *et al.*, 2011; Reisinger *et al.*, 2014). Moreover, changes in policy undermined the science of SLR, having far-reaching implications on the acceptance of the adaptation planning process and the legitimacy of adaptation decisions. Adaptive or preventative land-use planning has also been constrained by the existing rigid planning frameworks (Gorddard *et al.*, 2016), which fail to accommodate SLR and changing social-ecological systems.

The case study highlights the multi-scale governance and political challenges associated with local adaptation planning, and reinforces the relevance of adaptive governance to realising social justice in planning for SLR, through a more dynamic and flexible planning system informed by evolving understandings of climate change impacts. It also reinforces the need for leadership and leaders who value climate science.

7.2.2 Improving procedural justice

Connected with the wider governance context, the process of planning and decision-making influences the legitimacy of decisions (Paavola and Adger, 2006). As such, LMCC has been awarded a 2017 National Award for Planning Excellence for *Planning for Future Flood Risks: Marks Point and Belmont South Local Adaptation Plan*, recognising the strength of their collaborative planning process. As the first LAP for LMCC the approach was innovative and is likely to be improved upon over time. Participation in the LAP process was open to all, however the plan was very locally focused, which led to participation primarily from home owners in low-lying, at-risk areas. Studies of planning for SLR in France and New Zealand found that the climate adaptation preferences of residents in at-risk areas on the coast contrasted with residents in the hinterland (Hayward, 2008; Clément, Rey-Valette and Rulleau, 2015). An implication of this focus on the local scale and residents

of the at-risk area is that adaptation responses tend to prioritise protecting a temporally and spatially select set of private property interests (Hayward, 2008) - a response that is less supported at geographically larger and longer time scales, due to intergenerational equity concerns and costs to non-coastal residents and the environment (Cooper and McKenna, 2008). This study highlights that overly local conceptions of participation and justice can exacerbate inequality. This finding demonstrates the interdependency of procedural justice and distributional outcomes and the importance of considering appropriate scales and actors in planning and decision-making processes.

As described in the social justice framework (Figure 4), procedural justice considers the recognition, participation and power of vulnerable groups, because it is often the vulnerable who have the least input into decision-making, even at local scales. However, it can be difficult at the local scale to identify the vulnerable groups, and the 'most' vulnerable are not necessarily the waterfront residents facing the most risk from SLR, as these people are often more affluent and therefore better able to cope. So, there is a need to define vulnerability based on local understandings (Miller and Bowen, 2013) and specifically as 'social vulnerability', rather than primarily in terms of biophysical vulnerability. This gives emphasis to the capacity of individuals or social groups to cope with external stresses, with a focus on socio-economic and institutional constraints that limit people's ability to respond effectively (Kelly and Adger, 2000). Recognising and prioritising the participation of socially vulnerable groups can avoid further disadvantage and unintended negative outcomes for vulnerable groups. The principle of putting the most vulnerable first acknowledges that decision-making processes must recognise and enable participation for all even at local scales. Therefore, the case study identified the need for broader participation in local adaptation planning, which is a key learning for future planning practice.

McManus, Shrestha and Yoo (2014) identified in their study of climate change adaptation and equity in Lake Macquarie that specific attention to at-risk suburbs where there is a concentration of more socially vulnerable residents would be inequitable because it may lead to a decline in property values. However, this concern could be ameliorated by adhering to a principle of making information about the implications of SLR available to all in an open and timely manner. Care would be taken that these socio-economically disadvantaged areas are not framed (by adaptation planners) as more at-risk than other low-lying areas and support could be prioritised to help those who need it most, in keeping with a *redistributive* interpretation of justice (Adger, Paavola and Huq, 2006; Dow, Kasperson and Bohn, 2006; Lukasiewicz *et al.*, 2013; Rulleau, Rey-Valette and Clément, 2015).

These equity concerns highlight the importance of making accurate information about SLR projections and impacts available to and accessible to the whole community. Essentially, the government at all levels has a duty of care to ensure that plans and policies addressing SLR are based on sound science, to ensure accurate information on SLR is available to all in a timely manner and to

counter any confusion generated by those with vested interests in private property and development. Providing information in a timely manner is a key factor influencing procedural justice. Other temporal factors include, allowing sufficient time in the decision-making process for people to get involved, but not making the demands of participation too onerous, and early implementation of adaptation actions to reduce costs to current and future generations (Stern, 2007; Garnaut, 2011; Graham *et al.*, 2015). Thus, as identified in the social justice framework, Figure 4, time has an overarching influence on both procedural and distributive justice, and crucially that the provision of timely and accurate scientific information should be embedded in SLR policy.

The need for inclusive planning and decision-making processes that seek to recognise vulnerabilities and redistribute power is widely understood, yet in practice there is a need for strong leadership and a commitment to continual improvement.

7.2.3 Proposing just principles for distributive outcomes

Planning for SLR leads to value conflicts between individuals and across society as distributive outcomes predominantly favour private property rights over the environment or future generations, especially at local scales (Cooper and McKenna, 2008; Hayward, 2008). For example, there is a tension between protecting private property rights and the public interest in protecting coastal ecosystems for access and enjoyment (O'Donnell and Gates, 2013). A major finding of this study is that the concerns and preferences discussed by householders in relation to planning for SLR can be interpreted across two dimensions (as described in Figure 13), concern for property versus concern for people, and defensive versus diversified approaches. This interpretation highlights conflicts in moral values, however, there is also conflict between these moral values and place-based values which are strongly weighted toward the natural environment.

So, if identified values are in conflict what are the principles that will inform decision making in relation to that material object or adaptation strategy? This question can be tackled by explicitly identifying the principles that underpin different approaches, and considering who benefits and what are the impacts of the approach. For example, the protect and accommodate approach taken in the *Marks Point and Belmont South Local Adaptation Plan* is likely to be informed by a *libertarian* approach that prioritises property rights and an *efficiency-based* approach guided by value for money (Clément, Rey-Valette and Rulleau, 2015). The plan certainly protects property rights and proposes measures that involve low-costs to property owners and land managers in the short-term. However, in my view these principles do not represent a just approach as they neglect to recognise: the needs of the wider community including disadvantaged communities; different capacities to cope with adapting private property amongst landholders; intergenerational equity and protection of the vulnerable coastal environment. The LAP does not address long-term scenarios or the possibility of

rapid SLR. In this case, the adequacy of the plan depends on the spatial and temporal scale it is viewed from.

As discussed throughout the thesis, there is a need for flexibility and dynamism in planning for SLR. However, clear overarching guidelines or principles (Macintosh, Foerster and McDonald, 2015) and criteria for evaluating adaptation outcomes (Abel *et al.*, 2011) are also required. Therefore, what principles can guide us in measuring success beyond the concerns of individual adaptors and to look at distributive justice from a societal point of view? Individuals draw upon more than one decision making framework in planning for SLR (Alexander, Ryan and Measham, 2012), with this in mind, I recommend a set of four guiding principles for SLR policy development and planning practice, based on different criteria that explicitly address social justice normatively:

1. **Responsibility** - recognises people's awareness of the risks and their level of responsibility in making decisions and taking appropriate actions.
2. **Beneficiary pays** - those who benefit from an adaptation action pay for implementation.
3. **Redistribution** - assistance for people who are socially vulnerable, less able to cope.
4. **Intergenerational equity** - leaving future generations with less rather than more to address and with a more resilient society and environment.

In a procedural sense the approach involves discussing the guiding principles with a representative sample of the broader community and then using the principles to guide the development of adaptation options and implementation pathways at multiple scales.

7.2.4 Planned Retreat – a way forward

First and foremost in planned retreat, householders have the right to remain in their homes as long as possible (Leckie, 2013), and it needs to be planned ahead and part of a fair, transparent and inclusive process (Agyeman, Devine-Wright and Prange, 2009). The householder's expressions about what could make retreat more just closely matched the guiding factors proposed by academics in the resettlement field and therefore, could adequately inform future policy and planning practice.

Guiding factors that are applicable to planning for SLR more generally include: the need for strong government commitment and appropriate laws; a staged approach to planning using a continuum of adaptation responses; inclusive community involvement in the planning and decision-making process; and provision of financial assistance. The importance of financial assistance in retreat is key, assistance in the form of funds generated via a national carbon tax would be an appropriate way to share the burden of responsibility across wider geographical scales, and with business and industries that have contributed to and profited from the carbon economy. A national funding approach ensures that costs and benefits of retreat are examined at different scales (Cooper and McKenna,

2008; Clément, Rey-Valette and Rulleau, 2015). In practice, the final-outcome of retreat should be of benefit to the directly affected, the wider community and future generations, which is described by Hino, Field and Mach (2017) as the 'Mutual Agreement' approach. This highlights the applicability of the recommended guiding principles to guide processes and decision-making planning for SLR.

7.3 FURTHER RESEARCH

This research has been limited by the short, nine-month timeframe available to commence and complete the research within. The timeframe limited the number of interviews conducted and there was no capacity to complete a participatory workshop with key stakeholders, as was originally intended. The research outcomes could have been expanded through interviewing a greater diversity of householders living in the case study area, including socio-economically disadvantaged communities and those living further away from the lake in the LGA, as different groups may have expressed their understandings in a unique way. The participatory workshop would have provided the opportunity to develop a shared understanding of guiding principles for distributive justice in planning for SLR, or alternatively it could have tested and explicitly defined the guiding principles proposed by the research.

Further research could explore the significant issues of scale and timing in planning for SLR, seeking out an appropriate way that planning for SLR at multiple scales, not just at the local scale, could proceed. As such, this research has contributed in part to the wider objective of exploring how approaches at different scales, such as local, regional or state-based, have different results for procedural or distributive justice. Further research needs to consider what a national sea level rise or planned retreat policy might look like, and what elements should be included.

In conclusion, exploring the difficult endeavour of planning for SLR through a social justice lens contributes to a more inclusive planning process and more resilient planning outcomes. However, further research on the impacts of planning for SLR on disadvantaged communities or addressing disadvantage within the process of planning for SLR could progress social justice outcomes even further. In Australia the task of planning for SLR has largely been left to local government, and meeting the challenge of growing SLR and its impacts demands greater attention from all levels of government and all sectors of society. This research reinforces the need for more consistent policy and practical support from higher levels of government in order to support a more just and resilient future for coastal communities.

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APPENDIX A Coastal Case Studies and Key Learnings

Coastal Case Study	Key Learnings - understanding social justice or planned retreat
Australia	
<p>Examination of potential for planned retreat through the lens of Ostrom’s Institutional Analysis and Development Framework and a survey of 518 people in South East Queensland (Abel <i>et al.</i>, 2011).</p>	<ul style="list-style-type: none"> • Substantial public opposition to planned retreat, though compensation would reduce this somewhat • Criteria for evaluating outcomes should be based on dynamics of the social ecological system, the values of stakeholders and the needs of future generations • Formalise catastrophes as opportunities for change
<p>Online survey of 524 respondents from across Australia considered a managed retreat scheme, examined through a social functionalist frame (Alexander, Ryan and Measham, 2012).</p>	<ul style="list-style-type: none"> • People draw upon more than one decision making framework, people act as scientists, economists, prosecutors and theologians • A broad dialogue is required to address community concerns about managed retreat
<p>Representative telephone survey of 501 Queenslanders (Lo, 2014)</p>	<ul style="list-style-type: none"> • People’s attitude to property rights is associated with their climate-change belief • Appealing to absolute rights generally may be an effective way to approach the sceptical public on the issue of planned retreat
<p>Case study of five small communities in South-East Australia, conducted interviews and surveys with residents to examine lived values, perceptions of current adaptation policies and their social impacts. (Graham <i>et al.</i>, 2015)</p>	<ul style="list-style-type: none"> • Adaptation to sea level rise is likely to affect some groups more than others and in ways that will change the way of life in these communities • Residents want assurance that their diverse lived values are being considered in adaptation planning and they are concerned about procedural fairness

Coastal Case Study	Key Learnings - understanding social justice or planned retreat
New Zealand	
A case study of Waihi beach (Hayward, 2008)	<ul style="list-style-type: none"> • If public engagement in planning and decision-making is restricted to identified individuals and stakeholder groups, then these exercises simply become an opportunity to exercise private property rights rather than improving procedural justice in decision-making. • Implicit in the objectives of managed retreat are difficult wider choices about which values and assets we plan to protect as communities, for whom and at what cost. • Local councils cannot be left to wrestle with difficult temporal, spatial and procedural justice questions unaided.
France	
A choice experiment survey of 258 residents of coastal and hinterland communities in the south of France to understand public perceptions of fairness in managed retreat policies (Clément, Rey-Valette and Rulleau, 2015)	<ul style="list-style-type: none"> • Support for launch of managed realignment within 15 years but in stages and through a process of community engagement • National funding of managed retreat policies and compensation based on market process made managed realignment more acceptable, especially for coastal residents • Responsibility-based compensation criteria was favoured by people living in the hinterland
United Kingdom	
A qualitative study interviewing 38 local and regional stakeholders in Christchurch Bay on coastal planning (Few, Brown and Tompkins, 2007)	<ul style="list-style-type: none"> • National policy and regional studies emphasise that some form of managed realignment or retreat would be necessary, however it is unclear how these policies would be implemented at the local scale
Unites States of America	
Essay on managing shoreline retreat in the US (Kousky, 2014)	<ul style="list-style-type: none"> • Buyouts of flood-prone properties is undertaken by local governments using federal funds • Pre-disaster planning can lock-in retreat policies

Coastal Case Study	Key Learnings - understanding social justice or planned retreat
<p>Case study of three Alaskan communities affected by coastal erosion – Kivalina, Newtok and Shishmaref (Bronen and Chapin, 2013)</p>	<ul style="list-style-type: none"> • Lack of institutional framework to relocate public and private infrastructure of a community has resulted in villages willing but unable to relocate • Two villages have built pioneer infrastructure and one is working with the government to identify possible sites • Need an adaptive-governance strategy that can provide a continuum of responses to climate change
<p>Various case studies</p>	
<p>Examination of 27 cases of managed retreat (excluding resettlement driven by mining, dams or development) (Hino, Field and Mach, 2017)</p>	<ul style="list-style-type: none"> • Models of four types of managed retreat that uses the motivations of the implementing or enabling party and the residents affected as defining factors • ‘Mutual Agreement’ (residents initiate move and the broader community benefits), ‘Greater Good’ (similar to dam-related resettlement), ‘Hunkered Down’ (residents do not initiate and the broader society benefits little) and ‘Self Reliance’ (residents support but implementing party has little reason to assist) • ‘Self-Reliance’ cases have largely failed due to financial barriers, legal and institutional barriers • Place attachment and community networks strongly affect the final outcome in ‘Mutual Agreement’ • ‘Greater Good’ - the implementing party’s capacity, political will and power are the influencing factors

APPENDIX B Example Interview Questions for Householders

My Research

Understanding more about social justice (or fairness) in planning for rising sea levels. I'm interested in the concerns that people have about adaptation options, in particular, planned retreat and how it could be implemented.

Ethics and Consent Form

This form ensures that people participating in this research are doing so voluntarily and with an understanding of any risks involved in participating in the research. Participants will have their anonymity protected and will not be identified in the research report. However, due to the small number of people being interviewed, it is possible that someone may be able to identify you.

Interview Schedule for Semi-Structured Interviews with Householders

I have a series of questions that I'm asking everyone, you can say as little or as much as you like. I will be covering 5 main topics. Starting with a couple of questions about you. Do you have any questions before we start?

Topic 1: About you and your neighbourhood

1. How long have you lived in the Lake Macquarie area?
2. Can you describe the suburb you live in?

Topic 2: Lake Macquarie and local values

3. What do you like and value about the Lake Macquarie area?
 - a. What attracted you to the area?
4. What have been some of the changes you've noticed in the area recently?
 - a. Such as demographic, house prices, commuting distances etc.
5. Have you ever thought about how climate change might affect the Lake Macquarie area?
 - a. What are your concerns?

Topic 3: Planning for rising sea levels

6. Who do you think should be responsible for addressing sea level rise? And why?
 - a. Is it government, industry and/or individuals?
 - b. Is it this generation or future generations?
7. Have you personally been involved with or taken any action in preparation for future rising sea levels or flooding?
8. Are you aware of any local plans concerning flooding, sea level rise or coastal risks?
 - a. If so, what did you hear about it or how were you involved?
 - b. Do you have any concerns or comments about these plans?
9. Have you thought about what is fair in planning for rising sea levels?
 - a. What would be a fair approach?

Topic 4: The options for adapting to sea level rise

10. There are some widely recognised options for planning for sea level rise and coastal risks, these are generally categorised as protect (for example build sea walls), accommodate (raise

the height of buildings and other infrastructure), retreat (move away from danger) or 'do nothing' (wait for buildings to be damaged). What options would you prefer and why?

Topic 5: Planned retreat scenarios

Planned retreat is one option being considered in very exposed coastal environments, but it's unclear exactly how planned retreat would or could be implemented and how it would impact the community.

11. What do you think planned retreat would involve?
12. What approach to planned retreat do you think would be better and why?
 - a. What approach do you think is more likely?

Closing remarks

Is there anything else you would like to add?

APPENDIX C Interview Register

Interviewee	Date of Interview	Code
<i>Key Informants</i>		
Local government officers (3 people)	7 June 2017	O1, O2, O3
Local government officer (formerly)	9 August 2017	O4
State government officers (2 people)	11 August 2017	SO1, SO2
Local Aboriginal group representative	4 August 2017	A1
Local Aboriginal group representative	11 August 2017	A2
<i>Key Informants/Householders</i>		
Community working group member	7 July 2017	KI1
Community working group member	19 July 2017	KI2
Community working group member	19 July 2017	KI3
Community working group member	19 July 2017	KI4
Community working group member	19 July 2017	KI5
<i>Householders</i>		
Householders (2 people)	7 June 2017	H1, H2
Householder	29 June 2017	H3
Householder	7 July 2017	H4
Householder	26 July 2017	H5
Householder	25 August 2017	H6

Additional Site Visits

Purpose	Date
Site familiarisation and photos	4 June 2017
Community working group meeting	13 July 2017
Visit historic Coon Island	4 August 2017

APPENDIX D Human Research Ethics Committee Approval

Office of the Deputy Vice-Chancellor
(Research)

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29 March 2017

Dear Dr Miller

Reference No: 5201700096

Title: *A case study of understandings of fairness and social justice in planning for sea level rise in Lake Macquarie, NSW*

Thank you for submitting the above application for ethical and scientific review. Your application was considered by the Macquarie University Human Research Ethics Committee (HREC (Human Sciences & Humanities)).

I am pleased to advise that ethical and scientific approval has been granted for this project to be conducted by:

- Macquarie University

This research meets the requirements set out in the *National Statement on Ethical Conduct in Human Research (2007 – Updated May 2015)* (the *National Statement*).

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. This approval is valid for five (5) years, subject to the submission of annual reports. Please submit your reports on the anniversary of the approval for this protocol.

3. All adverse events, including events which might affect the continued ethical and scientific acceptability of the project, must be reported to the HREC within 72 hours.

4. Proposed changes to the protocol and associated documents must be submitted to the Committee for approval before implementation.

It is the responsibility of the Chief investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Should you have any queries regarding your project, please contact the Ethics Secretariat on 9850 4194 or by email ethics.secretariat@mq.edu.au

The HREC (Human Sciences and Humanities) Terms of Reference and Standard Operating Procedures are available from the Research Office website at:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics

The HREC (Human Sciences and Humanities) wishes you every success in your research.

Yours sincerely



Dr Karolyn White
Director, Research Ethics & Integrity,
Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research* (2007) and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

Details of this approval are as follows:

Approval Date: 24 March 2017

The following documentation has been reviewed and approved by the HREC (Human Sciences & Humanities):

Documents reviewed	Version no.	Date
Macquarie University Ethics Application Form		Revised application received 8/03/2017
Response addressing HREC's queries		Received 8/03/2017
Participant Information and Consent Form – Householder Interviews	1	8/03/2017
Participant Information and Consent Form – Key Informants	1	8/03/2017
Interview Schedule for Semi-Structured Interviews with Key Informants	1	8/03/2017
Interview Schedule for Semi-Structured Interviews with Householders	1	8/03/2017
Advertisement	1	8/03/2017

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APPENDIX E Planned Retreat Scenarios Used in Interviews

Scenario One - The wait and see approach

In 2050 sea levels have risen and many areas of public land including beaches and lake foreshores are partly flooded or eroded. Over 30 years ago authorities adopted the approach to wait and see how fast sea levels rose. However, residents are becoming more concerned about the effects of flooding.

Floods are affecting hundreds of older houses every year. New houses were required to be built higher. Some people are feeling exhausted by the inconvenience and clean-up efforts after each flood. Many residents that could afford to have moved or re-built their house on higher ground.

A recent storm has badly damaged many roads, bridges and buildings, this event led the authorities to rush to identify those houses that will be required to be relocated immediately. Many of the affected residents cannot afford the costs of relocating so they must personally take on all the risk of staying, they are asked to sign a waiver. The residents who can afford to relocate their houses to a higher ground or simply move out. Disaster Recovery Funds are used to repair basic public infrastructure.

Scenario Two – Anticipatory Planning

It is 2025, sea levels are being monitored closely by authorities and are reported on a regular basis to the community, sea levels have risen by 20cm. Five years ago, a public process was established to plan for the long-term future of this area, coastal flooding and hazard maps clearly identified the properties that were most at risk. The community and authorities agreed that certain properties would need to be relocated to protect lives and infrastructure, so properties were earmarked for planned retreat by 2040 or a sea level rise of 30cm. Some people decided to leave and sold their properties with these planning controls in place. The government also opportunistically bought some properties and then leased them out.

In 2025 a community/government working group was established to identify possible options and sites for relocations, preferred sites were voted on by the community and the land was acquired by a cooperative with support from the authorities. Over a period of several years residents in the cooperative could swap their land for a piece of land in one of the elevated areas. Those that decided to stay were given one-on-one support to ensure they fully understood their decision. The authorities levied a special rate to develop the 'swapped' foreshore properties and properties previously purchased into a public nature reserve and they were able gain biobank credits to help offset costs of the land swap.