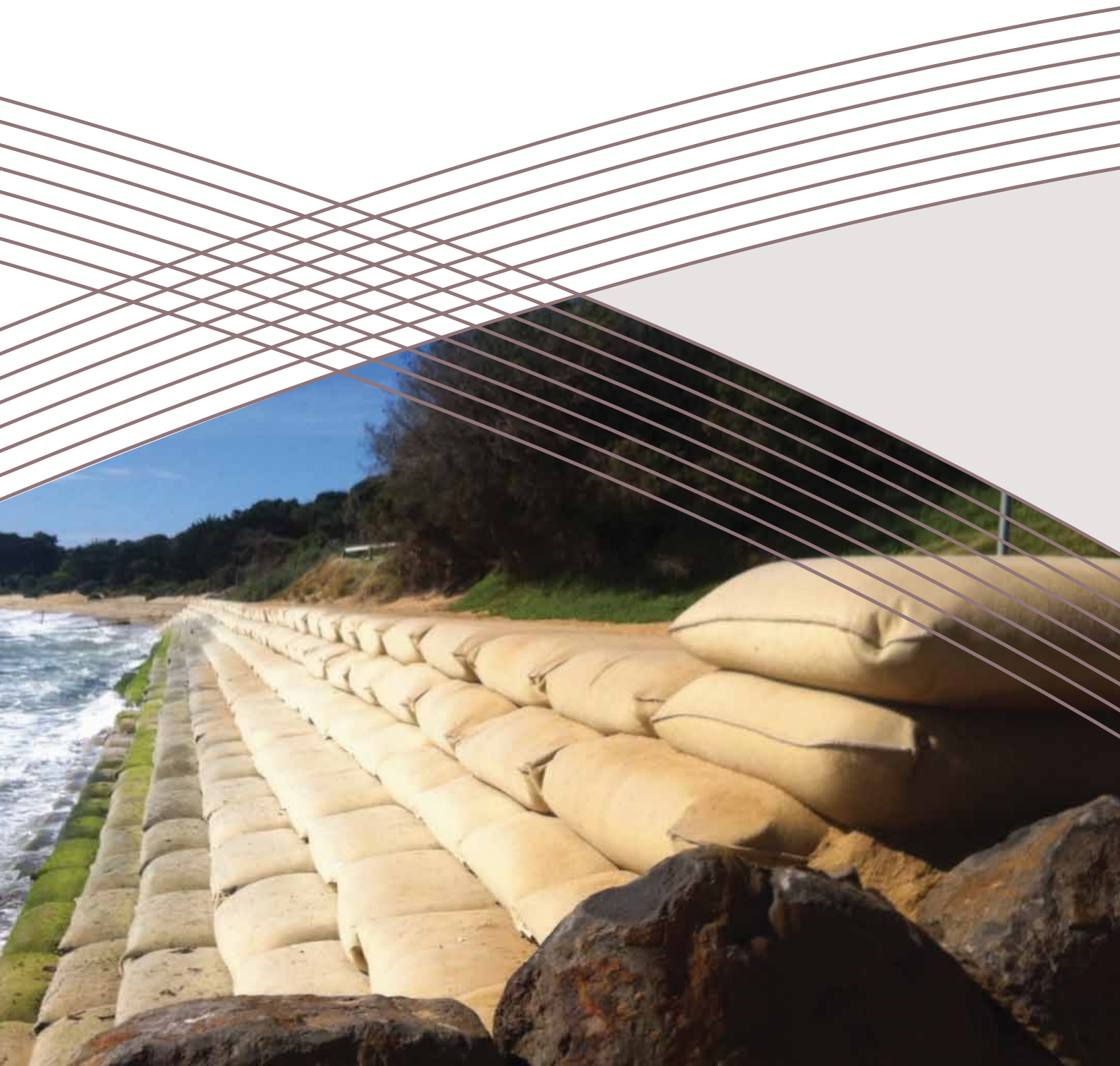


Barriers to adaptation to sea-level rise

Final Report

Jon Barnett, Elissa Waters, Sam Pendergast and Aedan Puleston



BARRIERS TO ADAPTATION TO SEA LEVEL RISE

**The legal, institutional and cultural barriers to
adaptation to sea-level rise in Australia**

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THE UNIVERSITY OF
MELBOURNE

Published by National Climate Change Adaptation Research Facility 2013

ISBN: 978-1-925039-06-1 NCCARF Publication 35/13

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Please cite this report as:

Barnett, J, Waters, E, Pendergast, S & Puleston, A 2013, *Barriers to adaptation to sea-level rise: The legal, institutional and cultural barriers to adaptation to sea-level rise in Australia*, National Climate Change Adaptation Research Facility, Gold Coast, 85 pp.

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Acknowledgement

This work was carried out with financial support from the Australian Government (Department of Climate Change and Energy Efficiency) and the National Climate Change Adaptation Research Facility (NCCARF).

The role of NCCARF is to lead the research community in a national interdisciplinary effort to generate the information needed by decision-makers in government, business and in vulnerable sectors and communities to manage the risk of climate change impacts.

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1. ABSTRACT

Increasingly there is recognition from researchers and policy makers that there are legal, institutional and cultural barriers to climate change adaptation that will need to be addressed if we are able to adapt efficiently and equitably. However, there is a limited body of evidence and few examples of how barriers to adaptation to sea level rise emerge and are addressed in local contexts. Focusing on sea level rise in Australia, this project undertakes inquiry into legal, institutional and cultural barriers to adaptation in two ways. The first is an investigation of barriers to climate change adaptation in general by analysing a unique body of evidence in a systematic document analysis of over eight hundred pages of submissions to the Australian Productivity Commission's inquiry to barriers to adaptation. The second was an in-depth investigation into community perceptions of one particular barrier - uncertainty about responsibility for adaptation - in two case study areas: Eurobodalla in New South Wales and Mornington Peninsula in Victoria.

The study found that, according to key actors in climate change adaptation in Australia, there are five key kinds of barriers to adaptation: governance, policy, uncertainty, resources, and psychosocial factors. The governance barrier of uncertainty about roles and responsibilities across levels of government and sectors was seen to be one of the most important barriers to adaptation. The subsequent empirical research into community preferences for the distribution of responsibility for key adaptation tasks revealed that there was strong support for a significant role for government in all aspects of adaptation. There is recognition that adaptation to sea level rise should be a shared responsibility, but with distinct roles for each level of government. Local government was seen to be best placed to manage public assets, regulate decisions about private assets, and lead and coordinate public input for local planning. Federal government was viewed as the most appropriate entity to take responsibility for information provision on the risks of sea level rise, and to bear most of the costs of adaptation. State governments, while not viewed as the primary responsible entity for any of these key tasks, was seen to have a role in coordinating adaptation actions across local government areas.

2. EXECUTIVE SUMMARY

Adaptation to sea level rise challenges individuals, communities and governments to make good decisions that are suitable to local contexts. There are a range of legal, institutional and cultural processes that act as barriers to adaptation, and which need to be overcome. Yet there is a limited body of evidence and few examples of how barriers to adaptation to sea level rise emerge and are addressed in local contexts. There is therefore a need to improve knowledge of the barriers to adaptation, in particular through empirical investigation. This study addresses this knowledge gap by: developing a typology of barriers to adaptation that can inform research and policy; and by investigating the effect of and proposed solutions to one barrier - uncertainty about responsibility for adaptation - as it affects two coastal local government areas (Eurobodalla shire in New South Wales, and Mornington Peninsula shire in Victoria).

The first phase of this project develops a typology of barriers to climate change adaptation based on a unique body of evidence. Systematic document analysis of over eight hundred pages of submissions to the Australian Productivity Commission's inquiry to barriers to adaptation was conducted. Analysis of submissions from governments, the private sector, and civil society, reveals that there are five key kinds of barriers to adaptation: governance, policy, uncertainty, resources, and psychosocial factors. Our results show that the various actors prioritized these barriers differently according to the sector in which they operate. However, some barriers are generally more important than others; governance and policy were consistently considered to be major impediments to adaptation. This report explains the implications of our analysis for efforts to enable adaptation. This stage of the project indicated that there would be value in an in-depth investigation of roles and responsibility for adaptation to sea level rise in the two case study areas.

The second phase of this project investigates the issues of responsibility for adaptation from the perspective of the people it matters to most in the context of sea level rise: coastal residents, business owners and managers. In total 80 semi-structured interviews were conducted: 37 in Eurobodalla and 43 in Mornington Peninsula. To set the context the interviews began by asking for the respondents' opinions on current regimes of coastal management, and their views on the likelihood of sea level rise and the policy options that will be needed to deal with the risk of sea level rise. The interviews then elicited preferences for who should be responsible for a range of key tasks associated with adaptation: providing information and creating knowledge; managing public assets; managing private assets; local planning; and cost bearing for adaptation.

Overall there was a strong preference among respondents for a significant role for government in adaptation. Local government was seen to be best placed to manage public assets, regulate decision making for private assets, and lead and coordinate public input for local planning. Federal government was viewed as the most appropriate entity to take responsibility for information provision on the risks of sea level rise and to bear the costs of adaptation. State governments, while not viewed as the primary responsible entity for any of these key tasks, was seen to have a role in coordinating adaptation actions across local government areas.

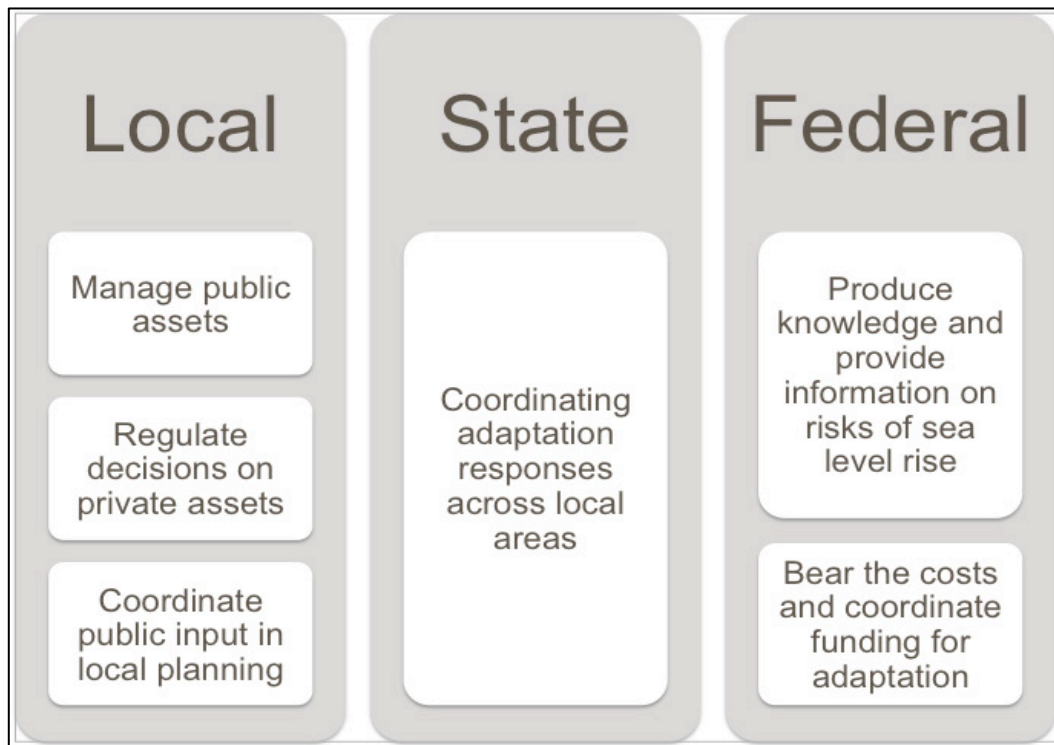


Figure 1: Majority preferences for the role of different levels of government in adaptation to sea level rise

By eliciting preferences for the distribution of responsibility for high-level adaptation tasks, the project provides evidence and information on approaches to adaptation governance that different groups find acceptable. This information can help policy makers begin the process of negotiating responsibility for adaptation across different levels of government and sectors, and address the barriers of uncertainty of responsibility for adaptation for sea level rise.

3. OBJECTIVES OF THE RESEARCH

As adaptation science and policy evolves it is becoming increasingly clear that there are a range of factors that impede adaptation to climate change. Yet knowledge about these barriers to adaptation is limited. While there is a modest amount of theory about them, this is not being tested and refined with evidence because there are few published cases of how adaptation actually happens (Arnell 2010; Ford, Berrang-Ford, and Paterson 2011), even if there is a steady groundswell of (undocumented) adaptation activity.

Barriers to adaptation are defined as “obstacles that can be overcome with concerted effort” (Moser and Ekstrom 2010). Adaptation means many things because the values at risk from climate change range from collective public goods shared by vast populations (such as world heritage areas, or the value of peace), to things that are shared by small populations (such as beaches, or traditional practices), to things that are highly individualistic (such as home gardens, or identity). Given this heterogeneity of adaptation concerns, there are likely to be many barriers to adaptation that range across scales, sectors and places. Yet this heterogeneity is not clearly evident in the literature on barriers to adaptation, which is largely deductive in nature, offering categories of barriers that are not well informed by examples from specific scales, sectors, or places.

As with adaptation to all sorts of climate risks, adapting to sea level rise will be impeded by both general barriers and those specific to the issue and the local contexts in which action is required. Knowledge about both kinds of barriers is therefore necessary. Knowledge about general barriers is best elicited from evidence gathered across multiple scales, sectors and places. Knowledge about specific barriers is best elicited from empirical investigation in specific adaptation contexts, and in the case of sea-level rise this means local coastal areas. This study meets these two knowledge needs by reviewing evidence about the general barriers to adaptation in Australia, and then by focusing on the role of uncertainty about responsibility for adaptation as a barrier to adaptation to sea-level rise in two communities in New South Wales and Victoria.

There are three main aims in this project:

1. To understand how legal, institutional, and cultural factors impede or facilitate effective, efficient, and equitable adaptation to sea level rise in Australia
2. To understand current and proposed approaches to determining roles and responsibilities for adaptation to sea level rise
3. To understand the preferences of coastal users and managers for the distribution of roles and responsibility

This project addressed these aims through five activities, each with a range of knowledge requirements and research tasks. The key research tasks were:

- A review of international literature on barriers to adaptation to climate change
- A review of Australian case studies on adaptation to sea level rise

- An analysis of the submissions to the Australian Productivity Commission's inquiry into *Barriers to Effective Climate Change Adaptation*
- A short review of international literature and Australian policy context of responsibility for adaptation
- Interviews with key coastal actors on preferences for the distribution of responsibility for adaptation to sea level rise

4. RESEARCH ACTIVITIES AND METHODS

In order to develop a rich body of evidence on barriers to adaptation this project took a mixed methods approach that collected data from two main sources of information:

1. Submissions to the Australian Productivity Commission's inquiry into Barriers to Effective Climate Change Adaptation
2. Key actors engaged in adaptation to sea level rise

4.1 Analysis of the Productivity Commission Submissions

The evidence that informs the first stage of this project, our typology of barriers to adaptation, comes from 79 submissions to the Australian Productivity Commission's inquiry into *Barriers to Effective Climate Change Adaptation*. The Productivity Commission is an independent authority created by an Act of Parliament in 1998. It provides research and advice on a range of issues affecting the welfare of Australians, and aims to help governments make better policies by leading public inquiries requested by government.

In 2011 the Commission was instructed to undertake a public inquiry into the regulatory and policy barriers that may be preventing effective and efficient adaptation to climate change across all sectors of the Australian economy. The aim of the inquiry was to gather public input into a topic of high-level importance to national policy and government programs, to collate the input and provide advice to the Australian government on the possible need for policy and regulatory reform on adaptation.

The resulting submissions to the inquiry are a unique, rich, cross-sectoral, cross-scale and timely dataset from which to learn about barriers to adaptation in Australia. The commission's position as the primary advisory body to government means that it commands broad engagement from individuals, governments, civil society groups, and businesses and peak bodies - a level of engagement that few if any research projects can achieve. Most of the organisations that made submissions have commenced climate change adaptation planning, or have conducted surveys of their affiliate organisations on the topic for the purposes of reporting back to the Commission.

The average length of each submission was nine pages. Because the submissions were voluntary we cannot say that the data is representative of all Australian organisations that will have to adapt to climate change. However, given the diversity of organisations that made submissions it is likely that the barriers they identify will span a considerable range of experiences in adaptation. Figure 2 shows the number of submissions grouped according to the role and function of the respondent.

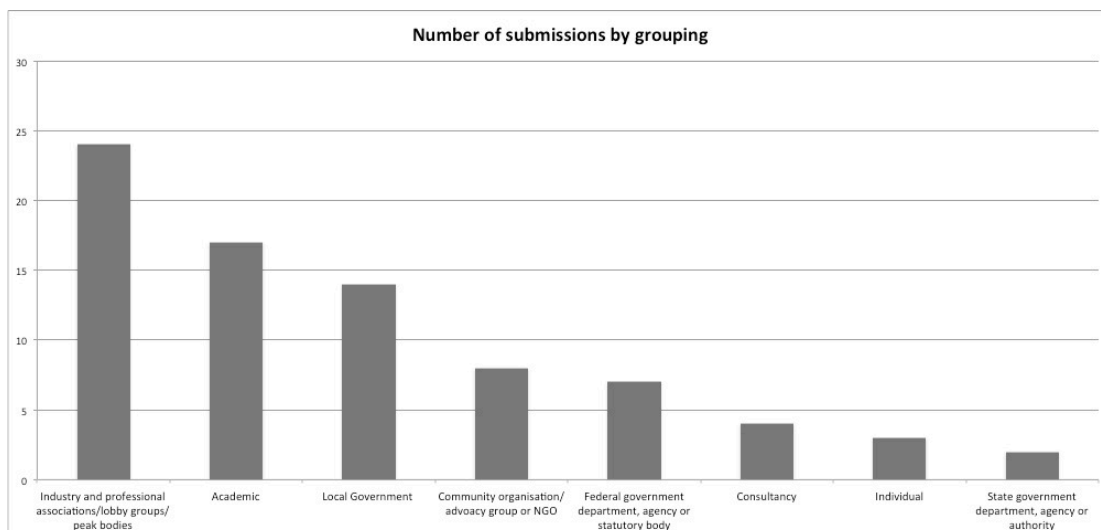


Figure 2: Number of Submissions by Groups of Respondents

4.1.1 The Productivity Commission Analysis Method

The method of data analysis consisted of a systematic enumeration of barriers identified in the submissions, pattern coding to create the typology and consistent crosschecking with the context of the original references in the submissions.

We counted the number of distinct barriers that were either explicitly referred to as a ‘barrier’ anywhere in each submission, or those mentioned in response to the following two question sets asked in the Commission’s original issues paper that was produced to elicit submissions:

- a) are there examples of policy or regulatory barriers that could inhibit adaptation? What are these? Could the objectives of these policies or regulations be met in alternative ways that have greater benefits and/or lower costs and distortions?
- b) What other significant barriers (for example, behavioural or organisational) might inhibit adaptation? What effects might these have on decisions about whether and how to adapt to climate change? (Productivity Commission 2011)

By focusing exclusively explicit barriers this approach takes a conservative view of the total number of barriers identified in the submissions. To a certain extent this is a limitation of the analysis in that implicit or subtle references to barriers are not included. We acknowledge that these references have the potential to be just as important as those explicitly mentioned, however as the aim of the analysis was to create a typology some limitations were needed in order to systematize the enumeration. Decisions about coding requirements were made by a single coder. Page references and justifications for each single code were recorded in excel and crosschecked for reliability in the final analysis.

Our approach to enumerating the distinct barriers had two aims and therefore two different methods. The first aim was to determine the total number of unique, distinct barriers identified across the submissions. We examined all the distinct barriers and eliminated repetition to ascertain the total number of unique, distinct barriers. The second aim was to investigate which barriers were most important to each of the respondent groups in order to draw conclusions about how barriers are prioritized in the Australian adaptation context. Here repetition across the submissions is important, so we summed the total number of distinct barriers identified across all the submissions.

The majority of responses conceptualised barriers to adaptation in terms of challenges that have or will come from predicted changes in climate and extreme events. Some submissions, however, framed the issue as a challenge in adapting to potential government policy and regulation. Since it is likely that adaptation will involve responding to both climate impacts and policy changes, we took these two framings to be equally important and took the same approach to analyzing both.

Finally, using the method of pattern coding (following Miles and Huberman) (Miles et al. 1994) we reviewed the total number of distinct barriers and analysed them for higher commonality. Pattern coding allows for the data to be broken into smaller analytic units, which can then be analysed for overarching themes or types, which have greater explicatory value. The results of this analysis technique are presented in Table 1, and these five themes form the basis of our analysis and typology. In this study, issues of reliability in developing the barrier types were dealt with by cross-checking for context with the language and emphasis of the original mentions in the submissions. Cross checking in this way allowed both the coding process and the typology development to occur in an iterative way which mirrors the context of the perceptions in the submissions. In this way we developed a typology that, rather than reflecting theoretical frames, emerges as a evidence based typology.

4.2 Study Sites

The study sites for this project are Eurobodalla Shire in New South Wales and Mornington Peninsula Shire in Victoria. The sites were chosen on the basis of three main criteria. The first required sites where sea level rise adaptation planning processes are currently underway in some form, as this gives weight to findings that focus on experiences and opinions, and relevance to research outputs for end users, including other local governments which may not have begun adaptation planning. While both local government areas are undertaking adaptation planning, each is at different stages, is undertaking planning at different scales, and is planning within different state government policy contexts, which allows for comparisons in participant's experiences and opinions. The second criteria was based on the rule of experience: where coastal communities have some experience with either coastal hazards or coastal planning issues that may be analogous to the types of issues that could occur with sea level rise. This criteria is based on the assumption that if participants have experienced these impacts and outcomes they will have thought more about the issue and can provide more sophisticated perspectives (Spence et al. 2011; Whitmarsh 2008). Experience with the issue can also add relevance and

increase the level of buy in from the community and individual participants. Finally the researchers needed to have support from the local governments of both study sites. The method required interviews with managers and the identification of key local contacts as one angle in the snowball recruitment method. The local governments in both study sites were willing to have researchers undertake fieldwork in the local area, and expressed interest in the outcomes of the research.

4.2.1 Eurobodalla Shire, New South Wales

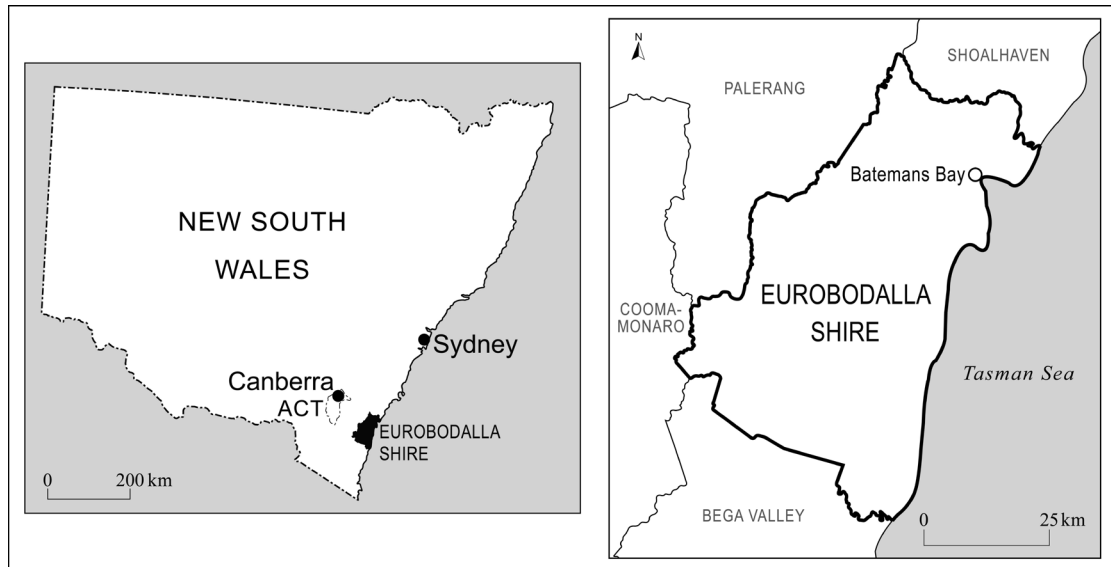


Figure 3: Map of Eurobodalla

Eurobodalla Shire is located in New South Wales approximately 150km east of Canberra and 300km south of Sydney. It is a predominantly rural LGA with a current estimated population of 37,320, the majority of these residents live in the larger coastal settlements of Batemans Bay, Tomakin, Moruya, Tuross Heads and Narooma. Given its proximity to Canberra and its peaceful coastal environment, the shire attracts many holiday-makers and second homeowners which have lead to approximately 28 per cent of the council's rate base living outside of the LGA. With 112km of coastline stretching from Durras Lake in the north to Wallaga Lake in the south, storm surge and inundation issues constitute a significant portion of the local government's environmental concerns and, as tourism is the primary industry for the LGA, maintaining an attractive coastal asset is crucial.

While much of the coastline remains undeveloped, significant infrastructure has been recognised as under threat from sea level rise, particularly within the shire's major settlements. These sites include Batemans Bay Campus of University of Wollongong, Moruya Airport, Moruya Campus TAFE and the Princes and Kings Highways. Specifically within Batemans Bay, Coastal Hazard Management Plans have identified multiple beachside developments as under threat, including Cullendulla Beach and Surfside Beach, Batemans Bay Beach Road and the Batemans Bay Central Business District.

Coastal hazards relevant to the Eurobodalla coastline include short term beach fluctuations which encompasses erosion from storms and changes in the shape of estuary entrances, long term coastline recession from aeolian sand transport, longshore drift and oceanic inundation of low lying areas (SMEC Australia 2012). Given the nature of these hazards the Eurobodalla Shire Council has been active in formulating a shire wide sea level rise policy¹.

4.2.2 Mornington Peninsula Shire, Victoria



Figure 4: Map of Mornington Peninsula

The Mornington Peninsula is located in Victoria 50 kilometres to the south of Melbourne and has a current estimated population of 150,682. With 190 kilometres of coastline the peninsula attracts many holidaymakers from the nearby state capital, and during the summer months the population can increase to around 250,000. The peninsula’s coastline is comprised of three distinctly different coastal environments, Port Philip to the northwest, Westernport Bay to the east and Bass Strait to the south.

The Port Philip Bay coastline stretches southwest, from Mount Eliza to Point Nepean and has seen the majority of residential growth on the peninsula, particularly within the Mornington and Mount Martha townships. Its protected coastal environment has ensured this area’s popularity among visitors and leisure seekers and is home to iconic bathing boxes - synonymous with the region’s identity as Melbourne’s coastal retreat

¹ At the time of writing, this remains an interim policy. For current information about the detail and status of the policy see the Eurobodalla Shire Council’s website www.esc.nsw.gov.au

destination. The Westernport Bay coastline also accommodates many of the 20-plus townships on the peninsula but they tend to be smaller, rural settlements such as Hastings, Somers and Flinders, interspersed with farmland and agricultural areas. Within Westernport bay the oceanic conditions are relatively protected and are subject to major tidal shifts. The southern coastline of Bass Strait from Point Nepean to Flinders consists predominantly of agricultural land at the eastern end and becomes the Rye and Portsea 'back beach' towards the west. This coastline is exposed to significant wave activity and as such, has seen less residential development encroaching on dune and cliff areas with most building taking place behind the dune system.

Various sites on the peninsula have been subject to coastal hazards such as storm surges and high storm tide events. These impacts are expected to intensify into the future due to climate change and high-risk areas have been identified. Crib Point, Hastings, Shoreham and Stony Point are the areas most at risk on the Western Port Bay coastline. Balcombe Creek, Dromana Bay, Safety Beach, Dunns Creek and West Rosebud are the sites deemed to be most at risk on the Port Philip Bay coastline (Kinrade and Justus 2013). For this reason we chose to focus the interviews on the Port Philip Bay section of the coastline.

As well as coastal hazards, coastal planning issues have cast light on sea level rise on the peninsula in recent years. Considerable media attention has been directed at the proposed Southern Peninsula Aquatic Centre, to be built on the Rosebud foreshore. Significant erosion in Weeroona Bay/Shelly Beach at Portsea in 2009 and 2010 required the installation of sandbags and a temporary rock wall to stabilise the dune system. The origin of changes along this stretch of coastline is under dispute. Some members of the public and conservationists groups attribute the loss of beach width to the 5 metre deepening of the channel into Port Phillip Bay.

Planning for sea level rise in Mornington Peninsula sits within the context of state-wide planning for climate change adaptation and sea level rise. The Victorian Coastal Strategy is the government's policy commitment for coastal, estuarine and marine environments in Victoria, and provides the direction for planning at a local government level. The strategy stipulates that planning authorities, including local governments need to:

Plan for sea-level rise of not less than 0.8 meters by 2100, and allow for the combined effects of tides, storm surges, coastal processes and local conditions such as topography and geology when assessing risks and impacts associated with climate change. (DPCD 2012)

While Mornington Peninsula is undertaking a range of planning initiatives to this end, including coastal action plans, the shire does not have a formal policy relating to adaptation to sea level rise.

4.3 Semi-structured Interviews

Semi-structured interviews were chosen as the method for the empirical part of this study. The aim of this section of the project was to elicit community views on coastal

management, sea level rise and governance and responsibility for adaptation. These are complex topics that suit the qualitative and exploratory nature of interviews, as opposed to questionnaires or surveys. The method allows time for an interviewee to think carefully, for a detailed explanation of the context of answers, and for a dialog between the interviewer and interviewee. These methodological elements were necessary considering the complex, potentially unfamiliar and somewhat controversial nature of interview content.

The interviews (see Attachment 1) were loosely structured in four parts: the interviewee's life on the coast, opinions on coastal management, opinions on sea level rise, and opinions on responsibility for adaptation. The design of the interviews aimed to begin with a relatively familiar subject matter and move logically through currently experienced issues and finally onto questions that were more future-based and that were worded to emphasise that they were hypothetical. The semi-structured nature of this method however allowed for the interview to be a discussion where interviewees could give as long or short a response as they wished and were able to fall back or jump forward and clarify responses as needed.

Interviewees were recruited using the snowball technique as this is seen to be useful in cases where the issue being investigated is sensitive, controversial or potentially divisive (Biernacki and Waldorf 1981). The political debate on climate change and the local controversies around coastal planning and sea level rise (outlined in sections 4.2.1 and 4.2.2) meant that there was potential for resistance to participate from some members of the community. In this situation the snowball technique with the reliance on personal referrals can build trust in the project amongst participants. At each site contacts were made with a number of key community leaders, business people and local government staff and these key contacts began the chains of referral that led to further recruitment. By reviewing the sample regularly and developing new chains of referral at various points we were able to obtain a good spread of perspectives and demographics across the sample.

Semi structured interviews have some limitations in that they generate a great deal of data that can be difficult to analyse and difficult to compare. Meaningful analysis of over eighty hours of interview data requires a number of decisions to be made about both the analysis process and the presentation of the data. In order to address these limitations the data was analysed in two ways. The first was a high level count of responses to the interview questions. Individual interview responses were recorded in Excel for each question and summed by study site and total interview count. The data from this analysis technique is presented in each section as a chart and a short description of the results. The second was detailed coding using Nvivo to themes with reference (but not adherence) to the themes of the interview questionnaire (See Appendix 1). The data from this analysis is presented as a discussion and explanation of the range of responses and examples of quotes that represent that range.

This project had two people coding the data, which can lead to problems with inter-coder reliability. A number of measures were taken to increase the reliability of the coding method and reduce errors in the data analysis, in line with the literature on data coding (Larsson 1993). First, both researchers coded an interview together to agree on

a common set of codes and themes. Second, the coders analysed a number of interviews separately, compared the coding results, negotiated and repeated the process until there was at least two thirds agreement. Finally, this test was repeated at the middle and end of the coding period to ensure reliability throughout the process.

The high level count has limitations as a data analysis technique, particularly in the method's reliance on the researcher to interpret responses. Many of the responses in the interviews were discussions rather than singular answers to discrete questions and are difficult to separate out from the qualifying elements of the answers. In order to reflect the lack of precision in these numbers we have presented the data in percentages rather than numbers. This form of data analysis does have the advantage of being easy to understand and is very useful in setting the context for the more nuanced qualitative data analysis of the second method.

4.4 Sample

In total 80 interviews were conducted: 37 in Eurobodalla and 43 in Mornington Peninsula. In part the difference in numbers between the two case studies reflected practical issues, with the location of Mornington Peninsula being easier to access for the researchers. In order to compare the findings from the two study sites the quantitative data was represented as a percentage of the total interviews for each study site rather than absolute interview numbers. Each interview lasted for an hour on average.

The total number of interviews also reflects the point to which theoretical saturation occurred in the sample. For each study site there was a point at which no new themes or theoretically divergent perspectives were emerging from the interviews. It is important to note that this does not mean that participants were expressing exactly the same sentiments, rather that over a period of four to five final interviews all themes mentioned had been referenced before in previous interviews. The two interviewers compared final interview recordings to confirm saturation for each study site. Theoretical saturation is unlikely to occur at the same number of interviews in each study site. Along with practical issues this is why there are different total numbers of interviews in Mornington Peninsula (n=43) and Eurobodalla (n=37).

Each study site has a number of coastal settlements, each distinct in character and demographics, and with unique coastal management issues. The interview sample reflects this diversity and includes participants from a range of settlements across each shire. In Mornington Peninsula these included: Mt Martha, Rye, Rosebud, Safety Beach, Dromana, McCrae, Portsea, Blairgowrie and Mornington. In Eurobodalla these included: Broulee, Mossy Point, Long Beach, Tomakin, Sunshine Bay, Moruya, Surfside and Bateman's Bay. While having a geographically diverse sample in the two shires does not guarantee diversity of perspectives in the interviews it does serve to limit the risk of responses being influenced by very local issues or group think.

Findings from the Productivity Commission Analysis (See Section 5.3) suggest that an explanatory variable in perspectives on adaptation may be the stake that actors have in adaptation rather than traditional demographic variables. In other words, we were interested to see if the role that different actors play in adaptation and planning might

influence the way that they thought about responsibility for adaptation to sea level rise. To investigate this we chose five categories that represented the most important roles in adaptation in the context of our project and recruited the sample based on these. The respondent types were: business owners, community organisation leaders, home owners at risk, those that were not at risk and managers who had some involvement in coastal management or adaptation planning. Figure 5 shows the number of respondents by type and study site across the 80 interview sample.

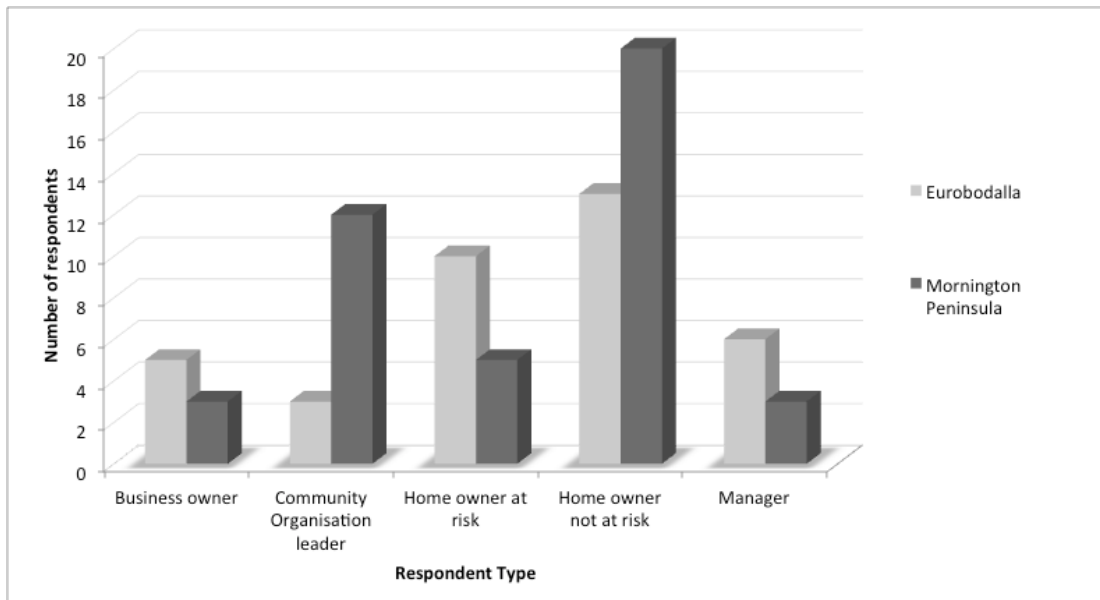


Figure 5: Number of interview respondents by Type and Study Site

The spread of interviews across these respondent type groups are deliberately uneven in an attempt to reflect the proportion of the stake that these groups have in the outcomes of adaptation planning processes. We interviewed more homeowners for instance, because they are more numerous. Due to difficulties in recruitment, the numbers of business owners are slightly lower than would have been ideal for this type of sample. The differences in the numbers between the study sites represent the structure of institutions in those areas. Mornington Peninsula has a significantly higher number of community organisations that are involved in coastal issues. ‘At risk’ home owners were recruited by location (beachfront) however they were only included in this category if they believed themselves to be at risk. This was to avoid basing the classification on our imperfect interpretation of coastal hazard mapping, and because the degree to which people consider themselves to be at risk in theory helps explain the responses better than a so called ‘objective’ measure of risk (see (Wolf, W N Adger, and Lorenzoni 2010). In Eurobodalla patterns of development on the coast, the types of hazards that the area faces, and perhaps familiarity with the sea level rise ad adaptation policy, meant that there were more interviewees in the at risk category than not at risk.

The sample elicited a wide range of views on the interview content and there was little evidence for significant response bias in the sample. Because the project is a

qualitative one, the sample size (n = 80) reflects the need to gain in-depth information from each participant and a range of participants across specific groups, rather than the need to have a random stratified sample of the population. The final sample covered the range of key coastal stakeholders that was necessary for a meaningful comparative analysis, while at the same time, allowed for the collection of the rich data necessary for qualitative analysis.

5. RESULTS AND OUTPUTS

5.1 *Barriers to Adaptation - Literature Review*

Recognition that there are barriers to adaptation was, in retrospect, a long time coming. It was arguably not until 2007, with the publication of the chapter on adaptation in the assessment report from Working Group II of the Intergovernmental Panel on Climate Change, that the idea that adaptation may not happen for various reasons first came to prominence (Neil Adger et al. 2007). Since then there has been a slow yet steady stream of publications on barriers, including those that theoretically analyse barriers to adaptation, and those that report on empirical studies of adaptation (Amundsen, Berglund, and Westskog 2010; Nielsen and Reenberg 2010; Patt and Schroter 2008; Wolf et al. 2010).

On a theoretical level, some studies have made efforts to deductively group, categorise or classify barriers to adaptation. In the Fourth Assessment Report for the Intergovernmental Panel on Climate Change, Adger et al. (2007) identify five broad categories of barriers to adaptation: financial, technological, cognitive, cultural and institutional (Neil Adger et al. 2007). In their analysis of barriers to adaptation in North America, Field *et al* (2010) classify barriers into three groups – social and cultural barriers; information and technological barriers; and financial and market barriers (Field et al. 2007). Jones and Boyd (2011) identify three broad categories of barriers to adaptation: those that are natural, including physical and ecological barriers; those that are human and informational, including knowledge, technological and economical; and those that are social, including cognitive, normative and institutional (Jones and Boyd 2011). Finally, Moser and Eckstrom (2010) identify four cross-cutting barriers to adaptation: leadership, resources, communication and information, and values and beliefs. While these studies have not led to a definitive typology for barriers to adaptation they have resulted in an increasing focus on barriers in the broader adaptation literature.

Studies of actual instances of adaptation have identified specific barriers, which differ depending on the context, place or sector of the case, and also seem to be somewhat influenced by the disciplinary orientation of the researchers.

Social and cognitive barriers, such as the issues of emotions, knowledge, risk perception, and reasoning are often identified as both barriers and enablers to adaptation (Grothmann and Patt 2005; Leiserowitz et al. 2012; Lorenzoni, Nicholson-Cole, and Whitmarsh 2007; Moser 2005; O'Neill and Hulme 2009; Swim et al. 2011; Wolf and Moser 2011). For example, studies from cases as diverse as adapting to heat stress in London (Abrahamson et al. 2008) to adapting to water stress in Kiribati (Kuruppu and Liverman 2011) show that the way in which individuals perceive risks and their capacity to manage them significantly influences the extent to which they engage in actions. At a more collective level, a number of studies also highlight the role of 'culture' – that is the symbols that express meaning, create collective outlooks and behaviors – in creating barriers to adaptation (Ford et al. 2006; Hovelsrud and Smit 2010; Kuruppu 2009; Mortreux and Barnett 2009; Nuttal 2009; Petheram et al. 2010; Roncoli et al. 2011; Rudiak-Gould 2012).

A wide range of institutional barriers are also beginning to surface from a range of studies. Research on governance and adaptation in both developing and developed country contexts (W Neil Adger 2001; Agrawal 2008; Burch 2010; Dovers and Hezri 2010; Finan and Nelson; Næss et al. 2005; Jantarasami, Lawler, and Thomas 2010; Juhola and Westerhoff 2011; Urwin and Jordan 2008), has revealed significant governance barriers concerning the challenges of coordinating institutions across scales and sectors, the distribution of responsibility for adaptation, and the responsiveness of institutions to change (W N Adger, Lorenzoni, and O'Brien 2009). Other research on institutions and adaptation has revealed barriers specifically related to leadership (Burch 2010; Flugman, Mozumder, and Randhir 2011; Moser 2005; Moser and Ekstrom 2010; Rosenzweig and Solecki 2010; Storbjörk 2010). Conversely, the importance of leadership in enabling adaptation at local scales has been demonstrated in cases from the United States (Rosenzweig and Solecki 2010) and Sweden (Storbjörk 2010).

Across the body of adaptation literature there is considerable discussion on the extent to which uncertainty is a barrier to adaptation (Amundsen, Berglund, and Westskog 2010; Bedsworth and Hanak 2010; Swart et al. 2009; Crabbé and Robin 2006; Few, Brown, and Tompkins 2007; Moser 2005; Tol, Klein, and Nicholls 2008). This is debated because, although it is undeniable that not knowing the magnitude of the risk in any given place can confound decision-making about adaptation, many argue that uncertainty is inevitable and ubiquitous across many policy problems, and that there are many approaches to making decisions that accommodate uncertainty (Dessai and Hulme 2004; Dovers and Hezri 2010; Sarewitz 2004; Wilby and Dessai 2010). However, while the impact of uncertainty on adaptation may be overstated, it is nevertheless an obstacle to adaptation.

Finally, the costs of adaptation – and more importantly the identification of who should bear these costs - are frequently identified as impediments to action (Neil Adger et al. 2007; Bedsworth 2012; Farber 2007; Mendelsohn 2006; Tol, Klein, and Nicholls 2008; Tompkins and Eakin 2012). For example, cost barriers are often raised in analyses of adaptation to sea-level rise (Few, Brown, and Tompkins 2007; Flugman, Mozumder, and Randhir 2011; Measham et al. 2011; Scally and Wescott 2011).

These studies give valuable insights into the barriers that emerge in the discrete cases that they study. Yet they are few and from across disparate places and sectors, making it difficult to induce from their findings a typology of barriers that might be used to guide further research and policy, or the relative importance of different types of barriers to different kinds of actors. This project aims to advance this emerging knowledge about barriers to adaptation by building a more comprehensive typology based on analysis of a unique and substantial body of evidence.

5.2 Barriers to Adaptation - Summary of Australian Case Studies

As the previous review demonstrates there is a growing body of literature that investigates barriers to adaptation to climate change. The following section reviews seven case studies that give insight into barriers to adaptation to sea level rise in the Australian context and the ways in which communities are addressing those barriers. These cases expose barriers consistent with those identified in the international

literature, while also reflecting the evolution of adaptation policy and practice in Australia.

In their New South Wales study Measham et al. (Measham et al. 2011) uncover barriers to the adaptation process in the context of municipal planning in three local government areas in the Sydney region. A further two case studies come from Queensland; Abel et al. (Abel et al. 2011) investigate obstacles to planned retreat in the southeast Queensland region, while Hastings and Childs (Hastings and Childs 2009) present findings from their longitudinal studies into SLR adaptation in Redcliffe; a local government area of Brisbane. The last three case studies come from Victoria; Scally and Wescott (Scally and Wescott 2011) investigate community perceptions towards adaptation in Barwon Heads, uncovering barriers in the process. Barnett et al. investigate equity outcomes relating to the adaptation process to sea level rise in Gippsland, and Paschen and Ison (Paschen and Ison 2011) highlight barriers and enablers in their study on narratives and adaptation in Port Fairy in Western Victoria.

5.2.1 Sydney Region, New South Wales

Measham et al (2011) investigate barriers and adaptation challenges to planning in three local government areas in Sydney. These local government areas have extensive coastlines, and as such the study has a strong focus on adaptation to sea level rise. The authors argue that in Australia local governments are the level of government that are experiencing the majority of the planning challenges of adaptation, with uncertainty around roles and responsibilities, constraints from broader policy settings and competing priorities for resources being paramount issues. The authors also argue that the adaptation literature has tended to consider constraints on local governments in a straightforward way in terms of a lack of information, institutional limitations, resource constraints and reactive management and argue that community-based environmental planning can offer insights through its focus on place and opportunity for local input.

The study interviews council staff across a range of roles from the three case study locations and finds a general bias towards mitigation compared to adaptation in the responses of participants. Respondents reported constraints and challenges relating to leadership, competing priorities, planning processes, information and institutional factors. With respect to leadership it is found that the opinions and values of mayors, CEOs and general managers influence the opinions of respondents, and also the relative focus on mitigation and adaptation. Information constraints relating to a lack of useful, credible and relevant information are identified by respondents as a key barrier for planning, however moves towards sea level rise mapping are noted as a tangible way to begin to overcome this barrier.

5.2.2 Southeast Queensland

Abel et al. (2011) investigate the sea level rise adaptation policy response of planned retreat by developing an analytical framework that can be applied to Southeast Queensland. Using the Institutional Analysis and Development Framework as their base, the authors explicitly focus on the politics of institutional change through the theory of public choice, and on socio-ecological systems by way of resilience theories relating to socio-ecological system dynamics, path dependency, and thresholds. The

authors apply this framework and assess the potential for planned retreat in South East Queensland by examining plans across government levels, conducting a workshop with planners and councillors, interviewing stakeholders, and surveying public attitudes.

The authors find a number of barriers to planned retreat as a policy tool for adaptation to sea level rise in South East Queensland. The study finds that State government coastal plans aim to provide for population growth; with local government plans required to conform to higher-level strategies and plans. Population growth is argued to be the primary driver of development rates in the region. Although local governments can exercise coastal zoning, the State planning minister can and does override these decisions. Indeed difference between State and local government priorities are significant, with a perception at the local government level that they are some of the most important sea level rise-related challenges they face, closely followed by a lack of resources and capability. The study highlights how some plans contain conflicting priorities, the incremental rather than holistic approach towards development approvals, and the potential for government to succumb to pressure to build hard defence as the number of residents in vulnerable areas and property values increase above certain thresholds. The authors also argue legal liability can incrementally drive planning when applications are refused but later found valid in court, and where land that has become riskier is rezoned causing values to fall. Overall the authors contend that various barriers exist within the policy and planning process, which favour hard defences at the expense of planned retreat. Coastal development in South East Queensland is likely continue, resulting in hard defences rather than planned retreat because of self-reinforcing feedbacks leading to path-dependency after irreversible thresholds are crossed..

The study does highlight factors that may enable planned retreat both in Australia and for a general audience. These include: the allocation of authority to levels of government at which it will be most effective; the designing of rules that stabilise socio-ecological systems restraining them from crossing unwanted thresholds; expecting the unexpected; changing rules and incentives that currently favour owners and developers at the expense of society; and formalising catastrophes as opportunities for change - including the implementation of planned retreat policies.

5.2.3 Redcliffe, Queensland

Hastings and Childs (2009) present the findings from the latest instalment of a twenty year old longitudinal study that has tracked the planning and adaptation responses and concerns regarding sea level rise in Redcliffe; a local government area to the north of Brisbane. The latest study, which conducts interviews with two council officers and two councillors, follows two previous studies in 1987 and 1996. The authors argue that many of the concerns found in 2008 are comparable with those from previous studies and that many of these concerns represent barriers to adaptation.

Evolving policy frameworks and their application are found to be ongoing concerns. Findings from the previous studies highlighted perceptions of coordination issues across levels of government including a lack of policy guidance from higher levels for local government decisions. However in the latest study it is found that council officers

are aware of the relevant policies and documents, and highlight guidelines from a specific state government document as enabling them in their planning roles for adaptation. Scientific uncertainty regarding the effects of climate change is found to be an ongoing concern, with sea level rise predictions changing over the course of the studies. In the most recent study, participants recognise that uncertainty is inherent, while others express general climate change scepticism.

Public opinion and subsequent political responses represent a barrier to adaptation in the study, particularly in the ever-changing levels of public belief in sea level rise over the course of the study. The lack of public interest has been seen as particularly problematic for council, and while more media coverage and political attention is found in 2008 this has not necessarily resulted in public interest and attention directed towards council for a planning response.

In the latest instalment new barriers also emerge including those relating to the availability of funding for adaptation, which is seen by some respondents as particularly pertinent. The potential for council to face litigation and complications with public risk management and private insurance markets were also raised as key concerns.

5.2.4 Barwon Heads, Victoria

Scally and Wescott's (2011) study, conducted in the Barwon Heads Estuary Complex southwest of Melbourne, explores the perceptions of local stakeholders towards climate change adaptation. The views of a range of stakeholders are argued to be important as local community support will ultimately decide the success and relevance of adaptation. As such, the stakeholders interviewed for the study include: scientists with a history of involvement with the area; managers and planners; and the wider community, including community groups and residents. These stakeholders are specifically asked about their perceptions of retreat, accommodation and protection as adaptation responses. For the most part, across interviewees, it is found that non-protective options are preferred; especially those that incorporate the precautionary principle and take into account the natural environment. While the perceptions of the community group of stakeholders towards adaptation are found to vary, a community-based response is perceived to be important. A shared response between the community and local government is also identified as essential, while some see the local governments role in adaptation as particularly vital.

The study also identifies a number of perceived limitations with the potential to impede adaptation to sea level rise, which function essentially as barriers to adaptation. Stakeholders felt that state and federal government planning was inconsistent and uncoordinated, stressing the need for the federal government to set core principles and the state government to devise associated policy and tools. Issues of cost and funding were also raised with the majority of respondents stressing the need for a co-ordinated funding response across the government and community. However, some respondents questioned whether inland communities would be willing to pay for impacts not directly related to them. Of perceived barriers, funding and resources were the most often identified, followed by: management confusion and a lack of coordination; community attitudes and expectations; lack of knowledge about climate change; lack of expertise and skilled professionals; lack of coordination between community groups; issues of

cost and responsibility; the land tenure system; lack of focus on marine and estuary environments; and the physical composition of the Barwon Estuary Complex.

The authors argue that their findings have wider implications, especially for policies such as planned retreat and the role of local government. Because of the diversity of views from the community group towards adaptation and the potential for resistance to adaptation responses, the authors argue greater communication and education is needed, together with more place-based research.

5.2.5 East Gippsland, Victoria

Barnett et al.'s (2011) ongoing project in Gippsland East aims to develop an approach for identifying the social and equity outcomes of various strategies for adaptation to sea-level rise. The study focuses on four Victorian coastal communities: Lakes Entrance, Port Albert, Seaspray and McLoughlin's Beach/ Mann's Beach. These communities were chosen because the Gippsland East coast—stretching from Wilson's Promontory in the south to Lakes Entrance in the north—has been characterised by the Australian Government as “one of the most vulnerable coastal areas in Australia” (DCC 2009, p. 93), where sea-level rise is “likely to lead to collapse of existing lake ecosystems and changes to land use” (DCC 2009, p. 93). These communities, particularly Lakes Entrance and Port Albert, have also been subject to various planning decisions that relate to sea-level rise and adaptation.

In the first year of the study interviews were conducted with policy actors across various levels of government and agencies to understand the nature of adaptation policy networks, policies and plans, and planning cultures.

The policy actors interviewed expressed concern about existing adaptation processes. First, uncertainty was expressed regarding the ‘scientific’ impacts of climate change. Uncertainty was also expressed regarding how decisions will be made in the future, and who will be involved in making those decisions. Second, it was found that respondents felt that adaptation had been imposed on them, and the Gippsland East region singled out by specific planning decisions regarding factors that may also be relevant, but not acted upon, in other areas. Third, this is seen to be unfair because Gippsland East is disadvantaged compared with other areas, and therefore less able to cope with the costs of adaptation. Finally, respondents highlighted the importance of cooperation and organisation between local, state and federal agencies. However, communication and coordination between the relevant agencies was perceived to be lacking and in need of improvement. Many of these concerns reflect the kinds of factors that are identified as barriers to adaptation in other studies and locations.

The authors argued that four things are emerging regarding what is seen as equitable for respondents in Gippsland East. Firstly, adaptation will take time especially if it is to be fair. Secondly, planning decisions should be universally applicable and also unambiguous in their interpretation. Thirdly, how climate change risk is communicated can affect the fairness of outcomes, with the way climate change is presented and language used seen to influence people's receptiveness. Finally, respondents feel that local ownership of the adaptation process is necessary, however, also that more support is needed from upper levels of government. Respondents also note that care

should be taken so that vested interests do not take over the process at the local level.

The second stage of the project has involved conducting interviews, a phone survey and a mail-out survey with residents and second home owners of the four communities mentioned above. The results of this part of the project indicate that there are many things that community members value about living in these localities that cannot be captured by economic metrics alone. For example, community members highlighted the importance of the natural environment, social interactions, recreational opportunities and provision of key infrastructure. This preliminary analysis indicates that there is a wide range of values that will need to be considered if equitable adaptation are to be developed.

5.2.6 Port Fairy, Victoria

Paschen and Ison's (2011) study of the Western Victorian coastal community of Port Fairy investigates local narratives on environmental change and adaptation and their relationship with adaptation policy and planning. Port Fairy was chosen as a case study because it is one of three coastal Victorian towns that are the focus of the Victorian Department of Sustainability and Environment's 'Future Coasts Program' pilot studies. Due to rapidly progressing beach and dune erosion on its East Beach, Port Fairy is recognised as a high risk location under the projected impacts of climate change, such as sea level rise, coastal inundation and increased storm surges.

Using narrative interviews and participant observation techniques, the study explores community perceptions of climate related risks and vulnerabilities (including sea level rise), as well as local determinants of adaptive capacity. The findings highlight the complexity of community understandings of climate related risks, causes and effects, as well as diverse opinions on adaptation options and attitudes towards government.

The study specifically focuses on barriers the community had identified in their experience of local adaptation planning as well as proposes relative enablers or drivers of adaptive capacity. The barriers and enablers are grouped into four broad categories: socio-cultural factors; economic factors; individual, psychological and emotional factors; and institutional factors (both formal and informal). The socio cultural barriers related to language, values and beliefs with a particular focus on the language of climate change and the role of identity in the town. Economic barriers included limited resources, town growth and planning issues, liability and insurance, and individual/municipal economic interests. The main psychological and emotional barriers, among others, were identified as a lack of trust in authorities, lack of belief in personal efficacy and reluctance to accept change. Institutional barriers made up a large part of the findings and included: lack of transparency in communication between government and the community; lack of information and knowledge networks within the community; lack of community participation in formal decision making and liability and litigation issues.

The study concludes with a list of existing enablers of adaptive capacity in Port Fairy and recommendations for how governments can use narrative social research to

improve the legitimacy and effectiveness of adaptation planning and policy at the local level.

5.2.7 Case Study Conclusions

From these case studies, and the issues they highlight, it is clear that the identification and classification of barriers to adaptation to sea level rise is in early stages in Australia. However while this may be true, these case studies do expose common themes, and expose challenges inherent in the adaptation process. Many of these barriers are consistent with those outlined in the wider international literature, however some of the barriers identified, and the ways barriers manifest, are unique to the Australian context. A reoccurring and dominant theme, which runs across these case studies, relates to the policy and institutional challenges that occur across government scales. It is also apparent that government perceptions of barriers have received the majority of attention from researchers as opposed to public perceptions. With the exception of the Port Fairy study, the experience of communities as a primary focus of the research is given less attention. While there is indeed a need for more place-based research on barriers, there also appears to be a need for studies that include a more diverse range of perspective including those of communities.

5.3 A Typology of Barriers to Adaptation

Our analysis of the 79 submissions to the Productivity Commission's inquiry into

Barriers to Effective Climate Change Adaptation, including from governments, the private sector, and civil society, reveals that there are five key kinds of barriers to adaptation. These concern governance, policy, uncertainty, resources, and psychosocial factors. Our results show that the respondents prioritized these barriers differently according to the sector in which they operate. However, some barriers are generally more important than others, with governance and policy being the major impediments to adaptation. The following is a detailed explanation of our results.

There were 50 unique and distinct barriers identified in the submissions, which together were mentioned 372 times. Analysis of the unique, distinct barriers reveals that they can be grouped into five types—governance, policy, psychosocial, resources and uncertainty—that best fit the emphasis, language and examples that the respondents put forward in the submissions. Table 1 identifies each of the fifty distinct barriers that were mentioned in the submissions to the inquiry. To identify which barriers are most important to which groups of respondents, we group the barriers into five general types.. Table 1 also shows the number of times all of the distinct barriers in each of these five categories was mentioned, enabling comparison of which of the five kinds was most important to all respondents. It is important to recognise that these refer to barriers to adaptation in response to a diverse range of climate risks and not just sea-level rise (as the Productivity Commission was interested in barriers to all kinds of adaptation). It is also perhaps worth noting that there is a considerable amount of resonance between these barriers to adaptation and barriers to effective resource and environmental policy and management in Australia (see for example Dovers 2005).

Table 1. Fifty distinct barriers to adaptation, grouped by theme. The number in brackets shows the number of times the distinct barriers in each of these five categories was mentioned in the submissions.

Governance (83)	Policy (84)	Psychosocial (39)	Resources (46)	Uncertainty (65)
<ul style="list-style-type: none"> ○ A lack of clarity on roles and responsibilities across levels of government ○ A lack of clarity on roles and responsibilities between the public and private sector ○ A lack of leadership at state and federal levels ○ A lack of leadership from organisations and business ○ A lack of coordination among arms of government ○ Competing demands between the public and private sectors ○ A mismatch between the time horizons for adaptation and political and management practices ○ Inconsistency in standards and policies across jurisdictions ○ Difficulties in trade offs between policy priorities 	<ul style="list-style-type: none"> ○ Lack of clarity on liability for decision making ○ Lack of certainty around compensation and injurious affection ○ Weak planning legislation unable to control development ○ Lack of uniformity in building regulations ○ The focus on mitigation has been a barrier to accepting adaptation ○ Regulation comes before appropriate technology ○ Insurance policies are unclear ○ Taxes on insurance products ○ A focus on disaster recovery rather than disaster prevention ○ A lack of consideration of equity in current policies 	<ul style="list-style-type: none"> ○ Perceptions of a lack of efficacy ○ Public disbelief in the science of climate change ○ The contestability of climate change, which creates a 'mandate barrier' ○ The tendency of people to discount future benefits ○ An emphasis on the individual rather than community ○ A lack of public understanding about levels of risk that they face ○ Cultural resistance to change ○ The adversarial nature of Australian politics ○ The 'desirability' of living in high risk areas ○ Apathy and issue fatigue ○ A fear of the unknown, resulting in denial 	<ul style="list-style-type: none"> ○ A lack of staffing, skills and expertise – particularly in local government ○ The cost of implementing adaptation actions ○ A lack of access to funding ○ Local governments constrained in their ability to raise revenue ○ The capital costs of engineering solutions ○ Constraints on the efficient use of capital for adaptation ○ A lack of targeted funding to vulnerable groups and areas ○ Increasing cost of doing business due to climate change policies ○ Low returns and limited markets for investment in adaptation 	<ul style="list-style-type: none"> ○ Uncertainty about climate impacts ○ A lack of data at local and regional scales ○ A lack of confidence in climate change projections at a local level ○ A lack of knowledge on implementation ○ A lack of support for interpretation of data ○ Uncertainty about appropriate planning tools and methodologies ○ A lack of research focusing on adaptation ○ A reliance on historical data and experience ○ Information not directed at specific audiences ○ Information is not relevant to many people ○ A lack of standards for interpreting data reliability

5.3.1 Governance Barriers

The barriers that relate to governance are concerned with the processes of steering adaptation decisions, as distinct from those that we categorize as policy barriers (which we see as outcomes of governance processes).

A key concern common to most respondents was the lack of clarity on roles and responsibilities for adaptation. For example, the Northern Alliance for Greenhouse Action said that:

There is continuing uncertainty about the scope of roles and responsibilities of different levels of government, and the need for coordination between local governments, particularly at a regional scale.

This issue was particularly important for the local government respondents. Most Local governments identified that the main barrier is the uncertainty surrounding decisions being made at higher levels of government and the lack of guidance on appropriate direction for local adaptation planning. For example, for Redland City Council:

The best short term response, we believe is to provide a clear framework for the roles and responsibilities of different levels of government, different geographic jurisdictions and different sectors of the community.'

Given this lack of clarity about roles and responsibilities within Australia's federal system of government, the substantial size of the bureaucracies within the Australian and State governments, and the relevance of climate change to most departments within these bureaucracies, it is not surprising that difficulties in coordination within levels of government is also seen as a barrier to adaptation. Thus, as noted by Consult Australia (a peak body for service providers in the environmental sector):

Policy and program development for adaptation tends to follow the traditional approach of delivering policies through discrete ministries and different levels of government. As a consequence it is fragmented across multiple ministerial portfolios, government departments and agencies, with no clear leadership, collaboration or coordination to avoid duplication and help ensure appropriate prioritization.

Coordination and consistency in standards and decision-making structures is also seen to be a governance barrier. This is particularly the case for industry and businesses that are faced with the challenge of adapting business operations in line with changing policy regimes and across complex and inconsistent jurisdictional boundaries. For example, for the Investor Group on Climate Change:

Different levels of government and different regulatory instruments have overlapping roles in terms of adaptation planning which poses challenges for investors and insurers. These different roles result in inconsistencies and uncertainties, which raise due diligence costs and increase the likelihood of ineffective adaptation measures being implemented.

For the National Farmers Federation, in emphasizing consistency:

Consistent legislation and regulation on a raft of issues, including environment, transport and planning, across regions would assist farmers seeking to move to take advantage of better climate conditions. Greater consistency would make this process easier, less costly and time consuming.

These governance barriers are significant in the submissions from all groups of respondents. They are the most important type of barrier in the submissions from local governments and industry and professional associations.

5.3.2 Policy barriers

Many of the barriers identified in the submissions refer to impediments that arise from existing policy regimes, and associated regulations and laws. As explained above, we see these as the outcomes of governance processes, and on this basis we distinguish these from governance barriers.

The lack of clear adaptation policy to guide land use planning at a state level is identified by many respondents as a key barrier to adaptation to climate risks. For example, in reference to planning for sea level rise the Mornington Peninsula Shire considers that:

The present lack of a comprehensive adaptation policy means that current regulatory responses are not integrated and accordingly not necessarily producing the most desired results.

Awareness that adaptation decisions may impose costs on some actors, uncertainty about whether or not compensation needs be paid for these costs, and, uncertainty about who is liable for these potential payments was highlighted as a barrier by a range of respondents, but particularly by the local governments. The majority of examples focus on the risk of legal challenges as the result of land use planning decisions that reduce the value of existing properties through prohibitions on development, or through planned retreat in the case of areas at risk from sea-level rise. For example, for the Sunshine Coast Council:

The potential exposure of local governments to major financial and economic implications of injurious affection could preclude the effective implementation of climate change adaptation policy decisions.

Similarly, the Shire of Busselton submitted that:

The status of private land ownership with regard to compensation for development refusal due to coastal planning constraints and the impacts of climate change is also an area which is considered to require further legislative clarification if local government is to have the confidence to move into the area of climate change adaptation.

Policies that influence insurance markets were also the subject of many submissions. Taxes on insurance products, inconsistency in regulations across States, and distrust in insurers were all seen as barriers to the effective use of insurance as an adaptation measure. Thus, the Insurance Council of Australia considers that:

There are regulatory issues that serve to inhibit the adaptive role insurance plays in assisting the community to recover from extreme weather events. For example, the imposition of taxes on general insurance products, to varying degrees in each state, serves as a pricing disincentive on the uptake of essential cover.

Finally a number of the submissions highlighted barriers that arise through the strong focus on mitigation in climate change debates and policies, which tends to frame adaptation as a similarly contentious issue, and undermines recognition of the need for action on adaptation. For example, the Australian Local Government Association states that:

The focus of public and political debate over the past three to four years has been almost exclusively on mitigation policy and in particular putting a price on carbon emissions. Whilst this is understandable to a certain extent it has nevertheless meant that intergovernmental work on adaptation has been less developed than it potentially could have been.

This problem of framing is also noted with respect to disaster risk management, where the issue is most salient during periods of disaster recovery to the detriment of the more proactive and cost effective preparedness phases.

Policy barriers such as these were seen as important by all groups of respondents. They were the most important barrier for the Federal government agencies, and for community organisations.

5.3.3 Psychosocial barriers

Across the submissions there was reference to a set of barriers, which we categorise as being psychosocial in nature – by which we mean that they concern non-material issues such as those relating to cognition, culture, feelings of empowerment, identity, and perception. For the most part these barriers revolve around an inability to comprehend climate change science and the risk of impacts, as well as the effect of fear and uncertainty on denial and apathy, and the tendency for short-term thinking rather than strategic long term planning. Most respondent groups raised these issues. For example for the Mornington Peninsula Shire:

There are a number of culture barriers within our society that inhibit adaptation. The emphasis we place on certainty and control to guide decision-making and society's high degree of risk aversion. We are good at short-term thinking but lack an ability to think longer-term.

Apathy about adaptation was also identified in many of the submissions. For example, local governments highlight the difficulty of implementing adaptation policies without support from local communities. Public disbelief in climate science and fatigue with the subject of climate change are the principal reasons given for this apathy towards adaptation. For example, for the Council of Capital City Lord Mayors the “sheer contestability of climate change in the public realm... [creates]...an additional ‘mandate’ barrier” to adaptation. For the National Sea Change Taskforce “pushback

arising from climate change skepticism is eroding local political support for adaptation planning initiatives”.

The electronic and print media is seen to be a key contributor to this barrier. Ku-ring-gai Council says:

Community attitudes to climate change are probably the single most significant barrier. This comes from the distortions in press that confuse and confound non-scientists.

This point is underscored by the Australian Psychological Society, whose submission suggested:

Media representations of public views and sentiments are often inaccurate and misleading and seriously disconfirm, contra-validate and erode individual and community motivation.

A number of submissions found the ‘desirability’ of living in high-risk areas, like in bushfire-prone areas in the peri-urban zone, or on sandy coasts, to be a barrier to effective land use planning for adaptation. The submission from the National Climate Change Adaptation Research Facility’s (NCCARF) Settlements and Infrastructure Network identified a barrier where:

The coast is so highly valued that developers and homeowners did not want to understand the risks involved. This was not because information is not available but rather because of the attractiveness of certain lifestyles.

Others broaden the scope to include the cultural emphasis on the individual rather than the common good, the collective unwillingness to change in some communities, and the significance of shared values and norms in creating barriers and enablers to adaptation. For example, for the Australian Academy of Technological Sciences and Engineering:

Fundamental to the implementation of adaptive options are embedded values, cultural or otherwise, that dominate how Australians perceive the future, what they value, what they deem to be success and what they desire for themselves and future generations. Most often these are subconsciously held values that impact on decisions about acceptance or otherwise of change.

Psychosocial barriers were not highly emphasized by the community organization’s responses, and they were the least important barrier for local government and industry respondent groups.

5.3.4 Resource Barriers

All five major groups of respondents mentioned lack of access to resources of various kinds. What we call ‘resources’ here includes human resources, money, and technology. Interestingly, no submissions explicitly referred to deficiencies in natural and social capital as barriers to adaptation (which, if nothing else reflects that a livelihoods approach to adaptation has less relevance in Australia).

A number of submissions asserted that the problem with funding is the distribution of funding across scales and sectors. The geographical isolation of some rural councils was given as an example where distribution of funding was an issue by the Victorian Local Governance Association:

Many local governments, particularly the smaller rural shires which are in many ways the most vulnerable, have very little capacity to develop policy in this area, and lack the financial resources to implement new programs.

It is notable though that few submissions identified that the costs of adaptation *per se* were prohibitive, but rather that the distribution of funding was not aligned with the *de facto* distribution of responsibility for adaptation that is emerging in Australia (that is, the burden is settling on local governments).

A lack of skills, training, time, capacity and technical expertise was also mentioned in many submissions. This is of particular concern for local governments such as those associated with the South East Councils Climate Change Alliance:

There are skills and capacity constraints within local government that limit their ability to play their role. Geomorphology, knowledge of coastal processes and vulnerability are generally areas outside of the expertise and experience of councils.

Industries and businesses also identified human resource constraints as a barrier, with the Green Building Council Australia saying that “a lack of knowledge and green skills remains a barrier to green building and climate change adaptation”, and Water Services Association of Australia identifying that “a lack of skills in the private and public sector to prioritise, develop and determine effective climate change adaptation measures is a barrier to effective adaptation”.

Industry groups and businesses highlighted barriers arising from the up front costs of investments in adaptation actions that yield benefits over long periods. The issue is explained by the Investor Group on Climate Change:

There is by definition a level of over investment in the resilience of the asset relative to the absence of certain climate change issues in the initial operating period of the asset. The cost of carrying this additional capital investment in the asset is therefore high relative to its short to medium term impact. These issues are most relevant in long-lived transport and social infrastructure projects such as airports, ports, railways and some road transport.

It is notable that resources were the most important barrier (equal with policy) only for the community organisations. They were the least important barrier for the academics and federal governments, and only of middling importance to local governments.

5.3.5 Uncertainty Barriers

Gaps in information are frequently mentioned in responses to the inquiry. The respondents rarely identify the barrier of uncertainty *per se*, but draw on specific contexts and instances where information needs pose challenges to adaptation.

The responses from local governments emphasized the lack of information at local scales, and for information tailored to local contexts. As expressed by the Australian Local Government Association:

There is a lack of relevant data at a scale and at sufficient reliability to allow informed decisions at the local and regional level. Improving data and information at the local and regional level remains a high priority need.

A lack of relevant, reliable, consistent and comprehensible climate projections is a key barrier for all respondent groups. For example, for the Queensland Farmers Federation:

A lack of relevant information on the hazards associated with climate change and the practices that may reduce risk is a major barrier to adaptation in agricultural industries.

Some submissions recognise that while information on adaptation does exist, the barriers relate more to access to that information, the capacity to understand it, and the lack of tools and techniques to translate information into informed decisions at the local level. A lack of capacity to judge the reliability and quality of information coming from multiple sources was also seen to be a key barrier, as noted by the Coasts and Climate Change Council:

Uncertainty about what constitutes reliable and scientifically based information results in major concerns about legal liability and timidity in decision making.

The Property Council of Australia also noted this problem:

Confusion and inconsistency in climate change adaptation is being exacerbated by the myriad sources of information and research available from Australia and overseas.

The challenge of adequately communicating information about climate change was seen by some respondents to be a barrier. Some respondents, including notably academics and community organisations, argue for information that is targeted to end users, and which includes the perspectives of vulnerable groups. For example, The Brotherhood of St Laurence identifies a barrier arising from “a lack of information that is relevant to the lived experience of people on low incomes and is accessible to them”, and for the Queensland Seafood Industry Association:

Information and data needs to be bundled in such a way as to meet the needs of specific audiences... Tailoring climate change messages to industry is a critical component of helping industry to adapt their businesses.

Of the five major groups whose submissions are analysed here, only the academics considered uncertainty as the major barrier to adaptation. It was nevertheless an important barrier for all groups, if slightly less so for those in local government.

5.3.6 The Relative Importance of Barrier Types

The secondary aim of this analysis was to investigate the relative importance of barrier types to different respondent groups. For reasons of simplification, we present here

only the analysis of the submissions from the five groups that made the most submissions – that is those from industry and professional associations, academics, local governments, federal agencies, and community organisations. Figure 6 shows which of the five types of barriers were most important to these five groups.

This analysis shows that governance barriers are the most important type of barrier to local governments and industry and professional associations, and the second most important barrier type to the federal government agencies. Policy barriers are the most important barrier to the federal government agencies, and the second most important to local governments and community organisations. The academic respondent group prioritized uncertainty barriers above governance and policy, with resources being less frequently mentioned than psychosocial barriers.

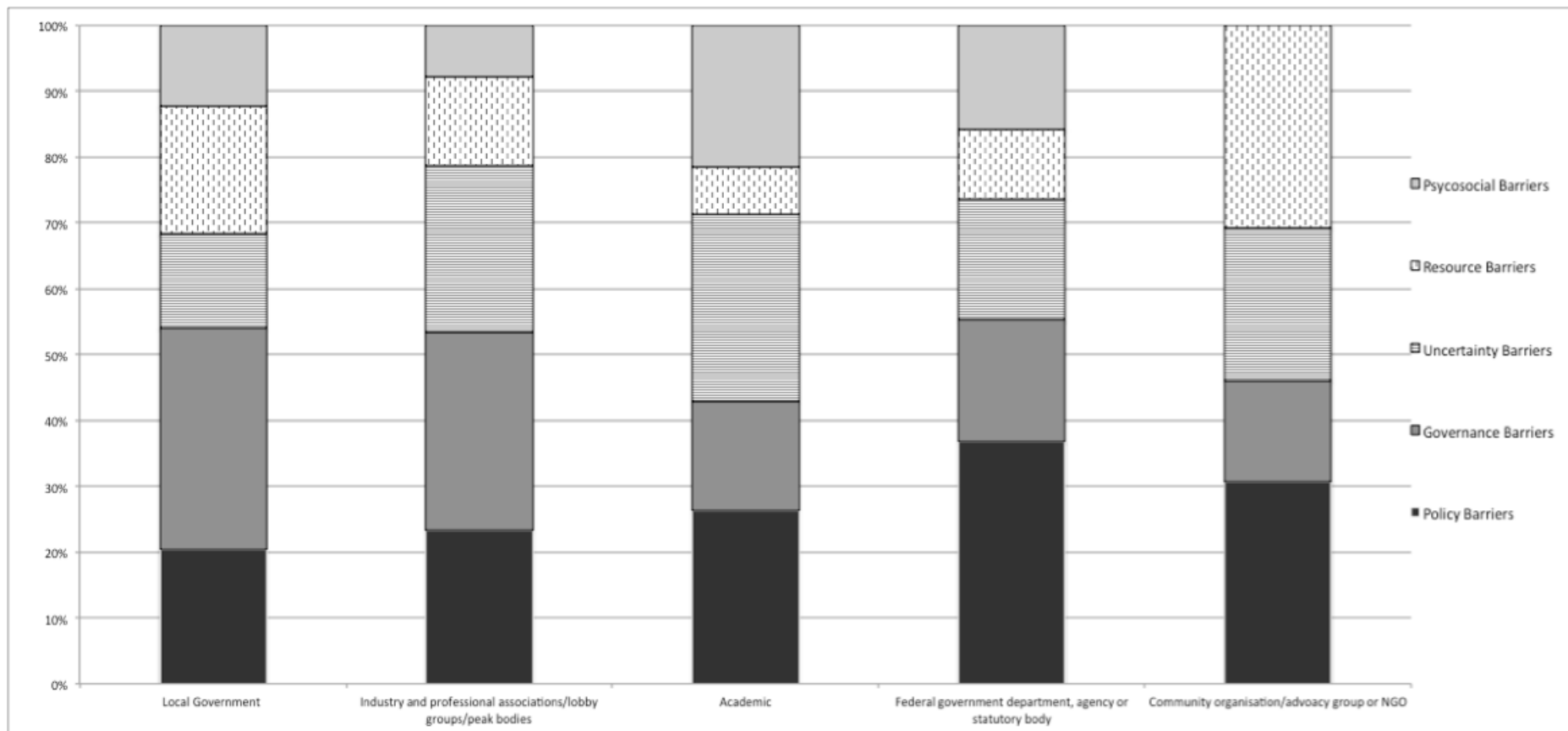


Figure 6: The sum of the number of distinct barriers mentioned in the submissions by each of the five groups that made the most submissions, aggregated into barrier type.

5.4 Responsibility for Adaptation

The findings of the first stage of this project identified that uncertainty about how responsibility for adaptation decision-making and implementation will be distributed across government, the private sector, civil society and individuals is a significant barrier to adaptation. The barriers identified in the Productivity Commission Analysis indicate that there is a need to investigate how roles and responsibilities can be distributed efficiently and equitably as a means to ensure that institutions are better able to deal with the challenges of adaptation on the coast.

The literature suggests that part of the uncertainty around allocating responsibility is related to an uncertainty about what is meant by the term 'responsibility' in an adaptation research and policy context. Various disciplines, including psychology, philosophy, political science, sociology, business, law, planning, and economics reference the importance of the issue of responsibility, albeit in quite different ways. Where these disciplines have explicitly investigated the concept, there is recognition that the term is complex, poorly articulated, and often poorly defined (Vincent 2009; Fleurbaey 1995; Gunder and Hillier 2007; Strydom 1999; Giddens 1999; Pellizzoni 2004).

In climate change research, the term responsibility is most often used in terms of responsibility for the production of greenhouse gas emissions, and in turn on potential liability for damages and the allocation of responsibility for funding adaptation (Baer et al. 2000; Meyer 2000; Farber 2007). While this is a fundamentally important aspect of responsibility for adaptation, this research offers little guidance with respect to understanding the issue of responsibility for making and implementing adaptation decisions about sea level rise within national contexts.

Researchers and policy makers have highlighted the importance of identifying key stakeholders and clarifying roles and responsibilities in the development of climate change adaptation policy (Burton et al. 2005). In Europe, many national adaptation plans have, nominally at least, assigned responsibility for climate change adaptation across levels of government and key regional authorities (Swart et al. 2009). However only in a few cases, such as the Scottish Climate Change Adaptation Framework (The Scottish Government 2009), have policies gone beyond regional and departmental formulations of responsibility to articulate the roles of both public and private sectors.

Australia, as with other countries such as the United States and Canada, is still struggling with the key governance question of who should do what when it comes to adaptation to climate change. The Australian Productivity Commission stated that one of the most significant barriers to adaptation was the lack of clarity, at all scales, of the roles and responsibilities of government and the public (Productivity Commission 2011). For adaptation to sea level rise in particular, this lack of clarity is all the more glaring. Currently, in Australia, responsibilities for climate change adaptation in general and sea level rise in particular are a complex mix of formal and informal responsibilities for coastal management that are often shared and duplicated across levels of government, organisations and the public and private sectors. The Coastal Climate Change Advisory Committee has recently highlighted the significant governance issues

of managing adaptation on the coast and has stated that the resolution of problems around responsibilities of the various coastal management actors and authorities is a matter of urgency (The Coastal Climate Change Advisory Committee 2010)

This project chose to investigate this issue of responsibility from the perspective of the people it matters most to in the context of sea level rise: coastal residents, business owners and managers. By eliciting preferences for the distribution of responsibility for high level adaptation tasks, the project aims to provide evidence and information that can help policy makers address this uncertainty of responsibility for adaptation for sea level rise, and possibly other adaptation contexts.

5.5 Community Preferences for the Distribution of Responsibility

The following section presents the results from eighty interviews conducted in Eurobodalla in New South Wales and Mornington Peninsula in Victoria. The interviews, which targeted home/business owners and managers, averaged approximately one hour in length and asked a range of questions about people's views on sea level rise, adaptation options and the distribution of responsibility for adaptation.

Each of the following sections gives the question that was asked in the interview, a description of the results, an outline of the range of responses across the case studies and respondent groups, and a short discussion of the implications of the findings.

5.5.1 Opinions on Coastal Management

Q: 'Thinking about coastal management, are there things that are working well? Are there things that are not working well?'

The interview asked about coastal management in the area; what respondents thought the big issues were and if they saw positive or negative outcomes from coastal management. This was an important primer for the subsequent discussion of sea level rise and, importantly, it provided information on the current context of views on governance structures for managing coastal problems.

On the whole the respondents had a negative view of coastal management in their local area. For Eurobodalla, the percentage of positive and negative responses was comparatively even, however in Mornington Peninsula negative responses made up a much larger proportion. A small number of respondents indicated that they didn't have an opinion on coastal management, as they were not aware of any activities or processes being undertaken in their local area.

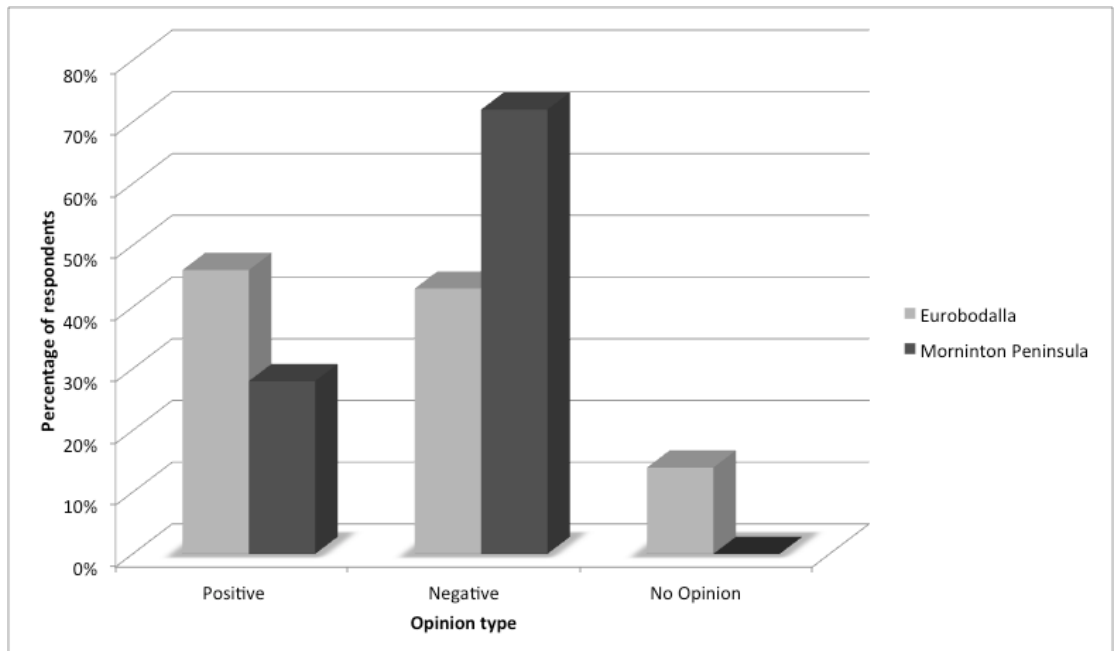


Figure 7: Respondents opinions of coastal management by study site

Justifications for the majority of the positive responses related to an overall perception of efficacy or an example of management where they had witnessed improvement like rubbish collection or vegetation management.

“Given these things are very tricky I think it’s probably working as well as it probably could.” Interview 1, Eurobodalla

“Well, I think the council does try to do their best in stabilising the dunes and things like that.” Interview 20, Eurobodalla

A number of the positive comments related to the role that community organisations and volunteers play in coastal management.

“The Dromana foreshore committee, I believe that that group of people who are just volunteers mainly, there’s a couple of paid people, but the rest of it is volunteer work, I think they’re doing a fantastic job with plant management and eradication of weed and all that sort of thing.” Interview 48, Mornington Peninsula

In contrast the negative responses were detailed, and related mostly to issues about governance and responsibility for coastal management across levels of government, agencies and the various community organisations. Criticisms centered on the fact that roles and responsibilities were neither joined up and clear, nor effective in many cases. This view was evident in both case study sites.

‘It depends where you put your foot on the sand or in the water as to whose responsibility it is. When it’s everybody’s, it’s nobody’s. So everybody duck shoves.’ Interview 51, Mornington Peninsula

“I think the structures of responsibility could be improved, and I think the efficiencies of responsibility as well.” Interview 2, Eurobodalla

In Mornington Peninsula much of the criticism referenced the fragmented nature of the governance structure for coastal management across the Shire, where separate coastal management committees of either council, state or community control govern small areas.

“I think that typifies really how so much coastal degradation has been allowed to occur is because we have these little fiefdoms all along the coast.” Interview 38, Mornington Peninsula

“I think it’s unwieldy. It’s unwieldy, far too split up into bureaucratic components” Interview 33, Mornington Peninsula

For some, it was the lack of policy implementation that drove negative opinions, where policy was developed and not implemented, or was developed outside of the context and experience of current local programs.

“What tends to happen is the shire planners produce great long reports, like the coastal management plan, and it goes in a drawer.” Interview 36, Mornington Peninsula

Opinions on coastal management are important as they have the potential to point to similar issues with adaptation to sea level rise. In thinking about barriers to adaptation to sea level rise it may be useful to consider the existing barriers to coastal management regimes.

5.5.2 Opinions on the Likely Impact of Sea Level Rise

Q: ‘How do you imagine sea level rise impacting this area? Prompt: Timeframes? Level of impact?’

In order to gauge views on responsibility for adaptation it was important to first establish the level to which the respondents saw sea level rise as a risk for the local area. By asking respondents how they “imagined” sea level rise impacting the area this question was worded to encourage individual conceptions of risks, impacts and timeframes. It was also carefully framed to avoid an emphasis on polarising framings such as ‘belief’. Almost without exception, in the cases where respondents did think there would be impacts, sea level rise was referred to on a time spectrum where impacts were already happening, going to happen soon or would not happen within their lifetime. Because of the importance the respondents placed on this framing, this is how we analysed the data.

In total a far greater proportion of respondents believed sea level rise would impact the area, than those who did not believe it would or were not sure. Of those that imagined an impact, the greater proportion saw it happening within their lifetime. This was reflected at the study site level in Mornington Peninsula, however, in Eurobodalla a slightly higher percentage viewed it as likely to happen outside their lifetime timeframe. More people in Eurobodalla believed that sea level rise would not impact the shire and,

in Mornington peninsula there was a greater proportion of people who were unsure about the likely impacts.

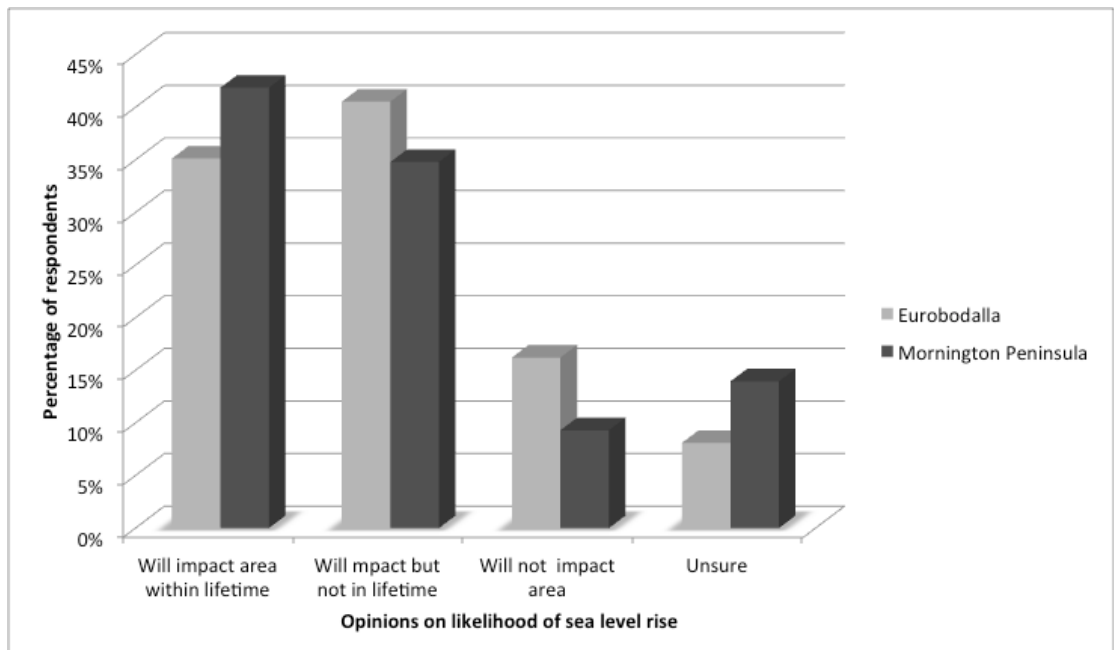


Figure 8: Respondents opinions on the likelihood of sea level rise by study site

When analysed by respondent type the results are somewhat more dynamic. Both types of homeowners are more likely to think that sea level rise will impact outside of their lifetimes than within their lifetimes². In contrast community organisation leaders and managers are more likely to believe the opposite. Business owners are the only group that are more likely to believe sea level rise will not impact at all.

² Homeowner respondent groupings are based on assessment of personal risk. 'Belief in sea level rise' relates to belief that the *local area* will be affected.

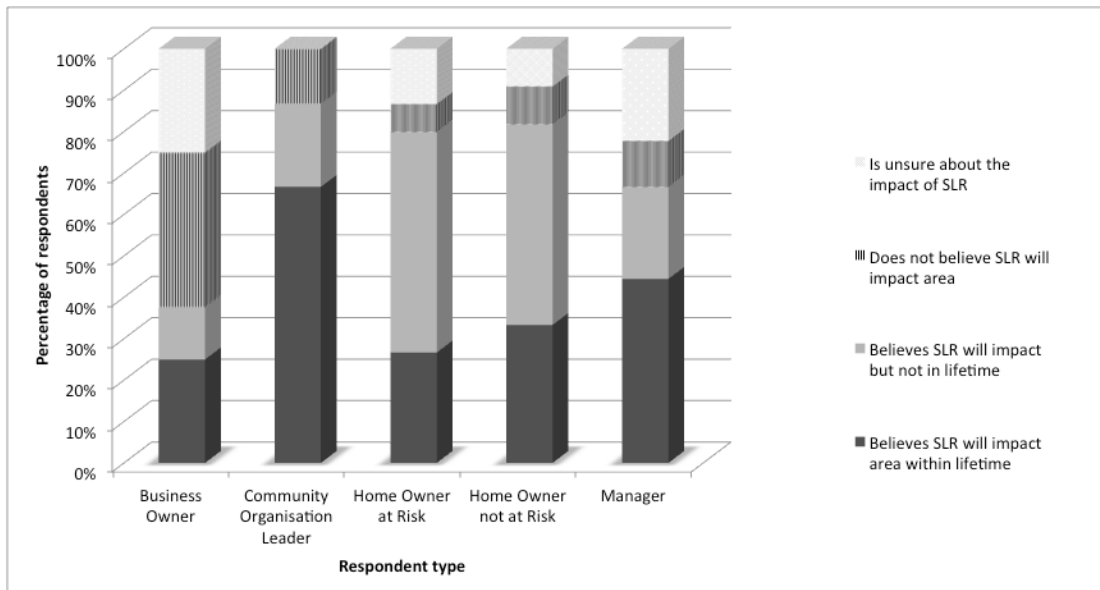


Figure 9: Respondents opinions on the likelihood of sea level rise by respondent type

Among those who thought that it would occur within their lifetime a number of people saw it as already happening and therefore there was a greater urgency to their views on what should be done to adapt.

‘So we’re firmly of the view that it’s occurring. Whether it will continue, for how long, who knows. But it’s occurring. So we feel that you do need to look for the future to manage it. I think the common thing that’s often said around governments is that you should take the precautionary principle. So we see that.’ Interview 36 Mornington Peninsula

For some the belief that it was likely to impact within their lifetime was based on scientific assessments of risks and impacts rather than experiential evidence.

‘I mean as we’re all well aware now, there’s well over 2,500 scientists around the world that categorically say, this is real this is happening and it’s mainly caused by human activities. It’s undeniable, except for a few clowns out there who are maybe sponsored by oil companies and so on.’ Interview 39a Mornington Peninsula

Others saw it as an inevitability that, while not immediate, sea level rise would be likely to be cause for concern and necessitate planning within their lifetime. For these people many had put thought into how they would adapt personally and what they expect of other institutions in planning for adaptation.

‘Yeah, I think it will, but I can’t say how much. Possibly, I’ve only got another - let’s hope I’ve got at least 20 years. I think that I can stay here for 20 years.’ Interview 16 Eurobodalla

'Yes, I do see that it's an issue. Do I think it needs to be monitored? Yes. Does it need to be legislated? Probably, because we need to protect some of these people against something that they don't understand.' Interview 52 Mornington Peninsula

Over a third of the respondents in both Mornington Peninsula and Eurobodalla recognised the emerging risk of sea level rise but saw it as an issue more likely to impact future generations.

'Well I'm sure it will eventually but whether I'll be around at that stage I don't know. Certainly my granddaughter's going to suffer I would say.' Interview 4 Eurobodalla

'I think it's far too complex for me to know, but my guess is that there is going to be a gradual rise over the decades. We don't have to worry about it next year or the year after, but maybe in 70, 80, 100 years, for this area it might be an issue.' Interview 24 Eurobodalla

As a result many interviewees indicated that, while they had thought about the risks and believed they were significant in the long term, most had not undertaken any adaptation planning or actions because of this long term view.

'Our committee don't even talk about sea level rising, because to be perfectly honest with you, if sea levels were to rise, I don't think it's going to happen in our lifetime. I don't think it'll be in my children's lifetime - maybe in my grandchildren's, maybe.' Interview 35 Mornington Peninsula

'So apart from rowing my boat to the front door, it's not going to stop me living here. It might stop three generations' time living here and the house might be worth nothing when I die.' Interview 49 Mornington Peninsula

A number of interviewees did not believe sea level rise would impact the area at all; there were two main reasons for this view. The first was a view that there was insufficient evidence, certainly in the form of observable local evidence of a rise.

'There's a lot of people that live down here who would argue that's a furphy, there isn't any sea level rises and I'd be one of them because in my opinion the level has actually dropped here, not by a lot, but it has dropped. We've got more beach here in Dromana than we had before. The high tide is further away from my boatshed now than it used to be.' Interview 54 Mornington Peninsula

'Climate change is one of those issues that people really don't believe. They won't believe it until it happens, I don't think. Although there's all this information about the impact of sea level increases, I don't think people will believe it until it happens.' Interview 45 Mornington Peninsula

'I can't see how it will happen because nothing is changing and the increase that is being predicted - for it to rise by a metre in 100 years it would have to have been significant by now and it hasn't been.' Interview 22 Eurobodalla

Beyond a lack of physical evidence, some respondents were hesitant to believe the scientific evidence they had seen based on the relative age of the statistics.

'Let's face it the Australian studies are 150 years of worthwhile records. So Australia's history's so short that the statistics that they've got are pretty useless. Two-hundred years even is a flash in time. Like they talk about 100 year floods and things, well we might have had two lots. We just don't know.'
Interview 26a Eurobodalla

While most respondents discussed their opinions with conviction some were unwilling to speculate on the possibility of future threats.

'I don't know. I don't know. I listen to all the arguments but I've been around a long time and I've heard lots of arguments before that didn't happen - lots of different things and they didn't happen. So I'm just like everybody else, I'm waiting to see.' Interview 40a Mornington Peninsula

It is clear from these findings that opinions on the nature of sea level rise risk differ greatly from scepticism to a firm belief the problem is real and must be addressed. Intrinsic to this finding is the challenge of implementing policy in response to an issue which some believe threatens their way of life but others dismiss as misinformation.

5.5.3 Opinions on Policy Options

Q: 'What do you think will need to be done to deal with these risks and adapt to sea level rise?'

It is likely that the types of policy options that people envisage for adaptation have some bearing on their views on who should do what to implement them. By leaving the question open, without categories or examples of options, we were able to collect information on both the range of adaptation options that were familiar to participants and their views on the necessity or efficacy of each. For ease of understanding we have presented the results using positive and negative evaluations, however it is acknowledged that in some cases the interviewees identified options that, while they didn't think it was a *positive* thing (like relocating vulnerable people), it might be a necessary adaptation task.

Respondents identified six adaptation options in total, that are generally representative of the range of options in the literature on adaptation to sea level rise (Tol, Klein, and Nicholls 2008; Cheong 2010). In all, the option that was mentioned most often in a positive light was restricting new development in at risk areas. Hard coastal protection, including sea walls and groynes, was the second most mentioned but was also the option with the most opposition, suggesting that it may be the most controversial. Relocating existing assets, or what is known as retreat, had support from around a third of the respondents but with some opposition. Soft Coastal protection, such as dune re-nourishment, and accommodation of assets, such as building houses on stilts, were mentioned favorably fewer times than the other options. Doing nothing was the least mentioned option and the response was largely offered by those interviewees who did not think sea level rise was going to affect the local area.

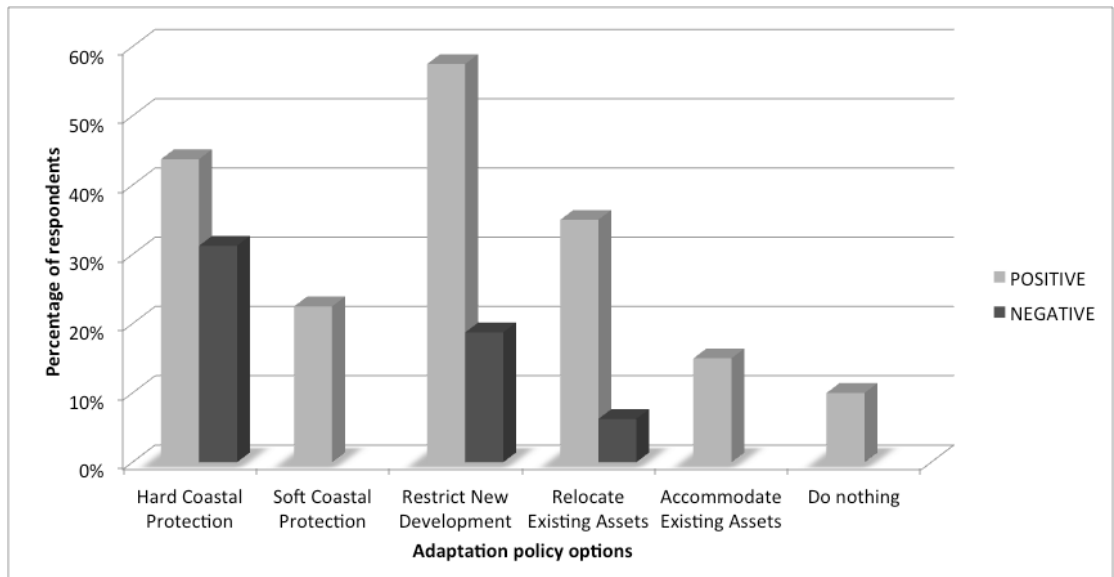


Figure 10: Opinions on adaptation options for sea level rise. Respondents were able to mention more than one option.

Most of the interviewees believed a combination of adaptation options would be required to adapt to sea level rise and some did not feel they had the knowledge to be able to prioritise particular options. In addition, the majority of interviewees (n=49) believed that one particular option was of the highest priority or most viable. The highest priority options overall were to restrict new development and relocate existing assets. In Mornington Peninsula relocating existing assets was the most frequently mentioned priority, as opposed to Eurobodalla where restricting new development was seen to be the highest priority. No respondents in Mornington Peninsula prioritised either types of coastal protection. In contrast over a third of the prioritisations for Eurobodalla concerned coastal protection. Doing nothing was the highest priority for a larger number of respondents in Eurobodalla than in Mornington Peninsula.

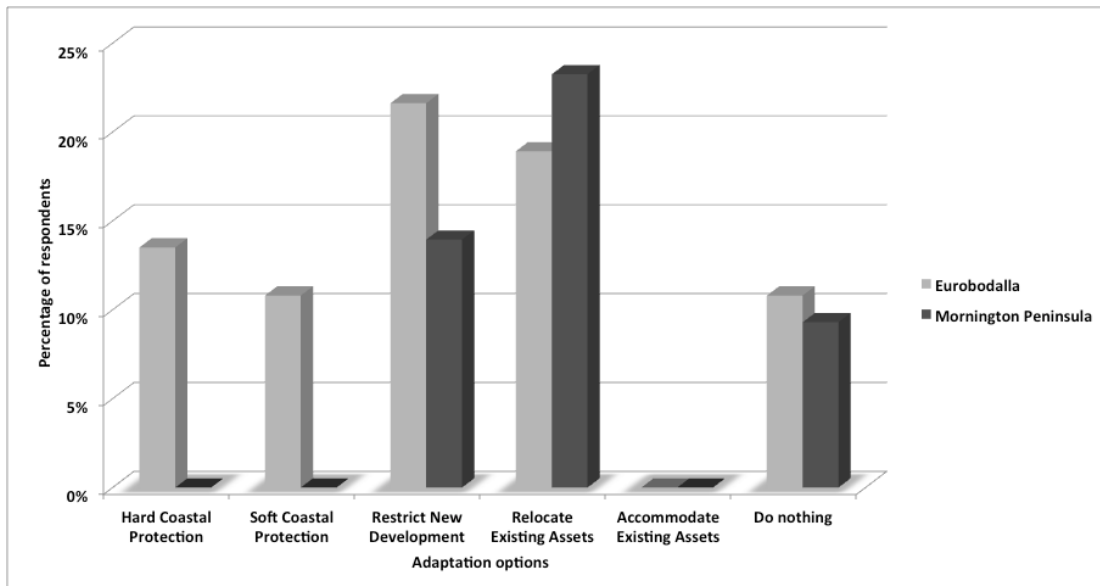


Figure 11: Opinions on the adaptation options that were of the highest priority. These results are presented as a percentage of the total number of interviewees that indicated that there was a priority (n=49) and contains no duplicate preferences.

Hard Coastal Protection/Engineering

The implementation of coastal protection works attracted both positive and negative responses. Some identified the potential of structures such as sea walls to protect built environments based on evidence from other parts of the world, others recognised the relative cost effectiveness of coastal protection compared to relocating entire communities. Respondents opposed to built protection were wary of interfering with coastal processes and discussed the resulting loss of coastal amenity when protective walls are built.

'So we need to look at firstly whether we can protect. It's cheaper to protect than compensate. It'd be cheaper to rock wall all these areas because we're talking in essence, 900 millimeters.' Interview 27 Mornington Peninsula

'Sand just moves up and down the coast, in and out of estuaries and a lot of it could be protected simply by putting in sea walls. Of course, the environment people don't like sea walls. Maybe they're not that great. However, we're already got a heap of them. A few more won't hurt.' Interview 14 Eurobodalla

'You can't - you just can't build a sea wall two meters high right round the coastline and if you did, well you'd lose all your beaches anyway so it would be a pretty unattractive option.' Interview 47 Mornington Peninsula

'The engineers are trying to pit against nature and they just don't understand, they just don't listen, they don't learn.' Interview 55a Mornington Peninsula

Soft Coastal Protection/Dune Renourishment

Support for soft coastal protection and dune renourishment was based on the environmentally favourable outcomes that this method offers. Often respondents would suggest this option in opposition to large engineering projects such as retaining walls or groynes.

'You want to try and - if you can use something environmentally friendly and not use a rock wall.' Interview 16a Eurobodalla

'I think if it got to a stage where sea level rise was obvious and the sea was likely to encroach on private property or even public infrastructure, there's obviously going to be a need for something to protect it. I have a feeling that beach nourishment and plantings of dune plants and so on, I know they won't stop it, but they'll help to slow it down.' Interview 5 Eurobodalla

Restrict New Development

Like hard coastal protection, the question of restricting new development attracted a high proportion of both positive and negative responses. While some saw this as the best method for a gradual transition away from coastal development others saw it as an infringement on the rights of the individual to develop their own land and take on their own risk.

'I think the planning guidelines for councils have to be a lot tougher on development in vulnerable areas. They've got a responsibility to take on change seriously and plan accordingly and they'll only do that if they've got reasonably good guidelines.' Interview 25 Mornington Peninsula

'There are plenty of vulnerable areas where people want to live, where they might want to but I don't think everybody has the right to live wherever they want to. I don't think humans have the right to tramp over and colonise every part of the world just because they think they want to.' Interview 30 Mornington Peninsula

'I wouldn't want to say no more development, because I don't really believe in that. I believe if somebody wants to build a house in an area that's going to sink into the sea, well, then let them build the house, but if the insurance company doesn't insure it, too bad' Interview 50a Mornington Peninsula

Relocate Existing Assets

'Do we go, oh, climate change is coming, sea level rise is coming, we're going to try and maintain this coast at a 1950 level. Or are we going to actually go, okay, we're going to lose some of this, so let's just - we'll yield. We'll roll with it.' Interview 43 Mornington Peninsula

As opposed to the alternate policy options discussed in interviews, preferences toward relocating existing assets generally came from recognition that it would be the only practical option given the nature of the threat. Unlike restricting new development or building coastal protection, which could be dealt with in the present and opposed to on

the grounds of offering an alternative, relocation was often spoken about as a future or eleventh hour response.

'I think they'll have to wear it, and move because the infrastructure will go as well. The sewerage, the lighting, the electricity, the gas - it's all going to go, and probably go before the houses go. I think the people there will have to just walk away.' Interview 19 Eurobodalla

'What can you do except to remove those buildings, pull them out altogether and make everyone move back?' Interview 15 Eurobodalla

The gradual process of buying back coastal land when it became available was mentioned as a possible lead-in initiative to efficiently prepare the coastal strip for inundation.

'They have to start looking at those facilities and structures that are right on the foreshore, that are in low areas, for example down here, and start saying well okay, maybe we should have some - I don't know, a buyback scheme or something and try and get these people off that area.' Interview 39a Mornington Peninsula

Accommodate Existing Assets

Accommodating existing assets was not an option identified often by respondents. Some discussed building houses that could resist inundation such as raised structures but they were more likely to mention houses that could be relocated.

'Years ago we were involved with some houses where they built stilts out over the water and there are houses built over the water. So it's all doable, we have the technology to do it all.' Interview 49 Mornington Peninsula

'But basically a road can be raised so over time a lot of adaptation can take place. I don't know what they're going to do with the Sydney Opera House but that's another story.' Interview 9 Eurobodalla

Do Nothing

While the percentage of respondents who believed nothing should be done to counter the threat of sea level rise was relatively small, they were made up of two distinct groups. Firstly those who didn't see sea level rise as a threat obviously believed it did not require a response. Secondly, some respondents were both sceptical about the future impact of sea level rise and also cautious about any human intervention with coastal processes.

'I'm a firm believer that you just let Mother Nature do what she wants to do. The world's existed for a very long time and we're the only ones meddling with it. If they go and build breakwaters out there to try and stop movement of sand, okay, we don't know what the flow-on effect from that is going to be. What could be seen as being a good thing at the time could end up being something tragic for a whole area. You just don't know.' Interview 28 Mornington Peninsula

'I just think we're over legislated and overruled just in case that happens. All it does is cost people money and cause angst and nothing happens, so it just keeps bureaucrats in their jobs of making up little rules. It's sort of unnecessary. You know that money could be spent other ways.' Interview 3 Eurobodalla

Following the discussion on adaptation options the interviewees were asked if they thought, in principle, that compensation was a fair policy tool to be using in conjunction with these adaptation options. Overall there were more people in favor of compensation than opposed in every respondent group with the exception of managers. An equal number of business owners were in favor as opposed. Homeowners at risk had the highest proportion of those in favor and the lowest of those opposed. Perhaps surprisingly the homeowners who were not at risk also had a significant proportion of people in favor of compensation.

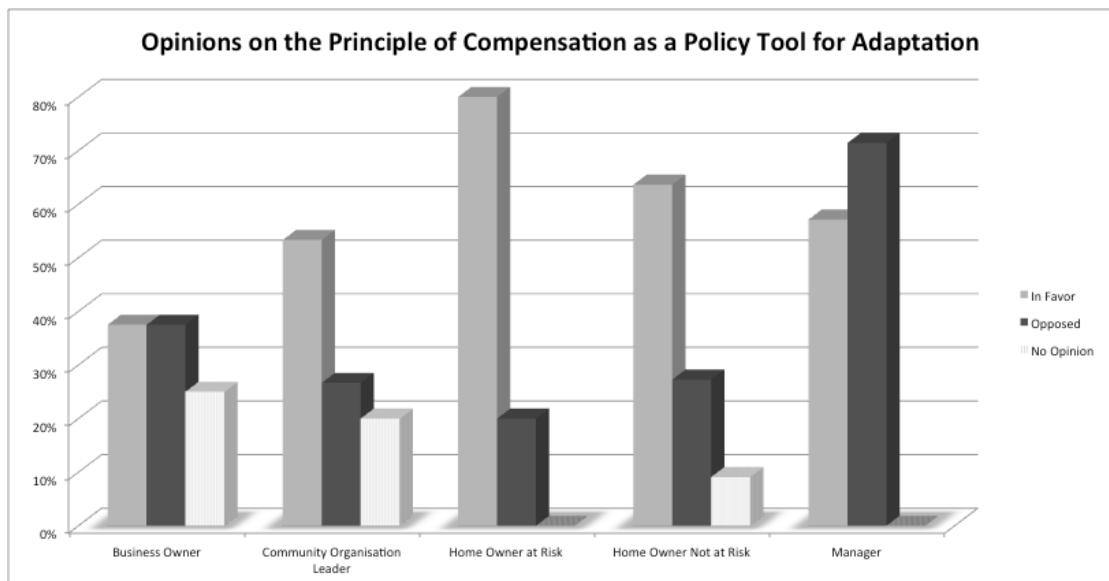


Figure 12: Opinions of the principle of compensation as a policy tool for adaptation by respondent type

In deciding on whether compensation was appropriate respondents provided nuanced responses and avoided simple yes/no answers. There was complexity in the way the interviewees thought about who should or shouldn't be compensated and why, particularly for those who, rather than having a strong view on the principle of compensation, believed it depended on circumstance.

For the most part compensation was discussed in terms of compensation for homeowners who are forced to move, or in the minority of discussions, for homeowners who are denied permission to acquire or build on land that has been deemed to be at risk. Individual's access to information on sea level rise projections and the associated risk was a significant factor in considering the merits of compensation. Essentially all respondents believed future homebuyers who are aware of the risks posed to their property should not be compensated. There was less unanimity when it came to homeowners who purchased before the risk became apparent. While some believed these established homeowners should be

compensated, others understood the risk to be a responsibility of the individual and not a cost to be borne by the taxpayer.

'My view, which is perhaps a little bit hard line, but it's basically saying the ratepayer, the taxpayer should not have to pick up the tab for people who have been warned, especially before development. It gets more difficult for people who in all innocence bought a house right near the shoreline, you know before there was any sort of knowledge on significant sea level rise, that's a more difficult one to handle.' Interview 9 Eurobodalla

'No. No I don't think they should be compensated because I think with today's technology wouldn't you research before you buy?' Interview 35 Mornington Peninsula

'Yeah, I think so. I think people that have been there for a long time should be protected because they weren't aware of the risks.' Interview 8 Eurobodalla

'Yes I support there being financial assistance for people to relocate. I'm not really a great fan of financial assistance in some instances like the corporate sector but people who've, in good faith, built their houses in areas where there was no policy to guide them that they shouldn't, yeah, should be assisted to move back from the coast.' Interview 38 Mornington Peninsula

For others the magnitude of the risk posed by sea level rise and the resulting cost of compensating all effected homeowners lead them to question the capacity of governments to pay. The fact that the costs may be beyond the financial capability of all levels of government was decisive in leading some to reject the possibility of compensation.

'I don't know how - how could governments possibly afford to compensate everybody - every house upon the bay, if their house got flooded down the track?' Interview 55a Mornington Peninsula

Some interviewees believed that compensation would not be necessary because the market could be relied on to manage risk, capital loss and the efficient distribution of the financial impact of future inundation.

'What will tend to happen over the years is some of these low lying areas become more obvious which areas are going to be affected first. People will simply move out and people will - if they're moving in, they'll be able to buy in at a very low price. The market will take care of it.' Interview 57 Mornington Peninsula

'I think the problem's going to be too big for compensation. I reckon the signals have to be gradually going out there so that it just comes into the property prices.' Interview 25a Eurobodalla

Many recognised private mechanisms such as insurance as the preferred method of funding adaptive options rather than offering taxpayer funded compensation.

'If someone was close to a tide or river and is now saying the government should compensate them because of sea level rise, I think I'd question whether my taxes should go towards that, the same way that I don't believe I should contribute to people whose houses have burnt down if they haven't bought insurance. That's their choice, it's on their shoulders. I pay my insurance every year, they can too.' Interview 10 Eurobodalla

Some justifications for compensation often came through discussing analogous circumstances where government assistance had been implemented in the past such as fire or natural disaster.

'I think they'd have to have some support. It'd sort of be like flood victims, or fire victims. We are victims of global warming, I suppose.' Interview 50a Mornington Peninsula

Some believed compensation was required given that the individuals who may suffer due to inundation and the loss of an asset are no more responsible for sea level rise than those who will suffer no financial loss. They believed asset loss for some and not others is not a fair and just outcome of a global issue.

'Let's make one thing quite clear. I am not responsible for sea level rise any more than the people up the hill are. I have not got a 25-megawatt power station sitting in my backyard that feeds only this house. Sometimes when you see the lights on you think it's like that but it isn't. I am not responsible for it and I don't see why we have to be the only ones that are going to be financially punished for people's excesses if it's caused by carbon dioxide. I have a huge problem with that.' Interview 23a Eurobodalla

For others the issue came down to the desire to live in a society where people treat each other in a humane manner.

'So I would think that there's a social responsibility to care for people humanely. As we would hope to care for the people on the Pacific islands if they come in and rehouse them because what do you do? That's a social responsibility.' Interview 51 Mornington Peninsula

This question did not aim to ascertain the interviewees willingness to pay for compensation to adaptation. Rather it aimed to investigate peoples views on the concept as a principle for adaptation policy. Overall there seems to be support for compensation as part of an adaptation policy response, however circumstances in which this is fair, and the mechanisms with which compensation is achieved matter to the interviewees in this study. The complexity of the responses to this question suggests that more research is needed on this topic.

5.5.4 Preferences for Responsibility for Information Provision

Q: ‘Who do you think should be providing information and creating knowledge on the risk of sea level rise?’

Providing information and creating knowledge about the risks of sea level rise is a key adaptation task. Currently responsibility for information provision and knowledge creation is fragmented across different levels of government, academic institutions, private consultancies and community organisations. This fragmentation can lead to conflicting information about risks and a subsequent decline in credibility of climate science and information, which has been identified in this project as a barrier to adaptation. In the interview, this question aimed to elicit preferences for which of these is most appropriate to take on this responsibility and, importantly, the justifications for these preferences. For many of the interviewees the ideal response was a combination of options, as such the below data (sections 5.6.4 – 5.6.8) represents the percentage of respondents that mentioned a particular group of institutional actors.

Opinions on who should be responsible for providing information and creating knowledge on the risk of sea level rise showed a clear preference for a role for government. The majority of respondents saw the federal government as best equipped to provide and disseminate information. Around half believed the state government should also take responsibility and fewer saw local government having a role. The category of other gained a greater proportion of preferences than in any of the following questions on responsibility and was preferred by a higher proportion of interviewees in Mornington Peninsula than in Eurobodalla.

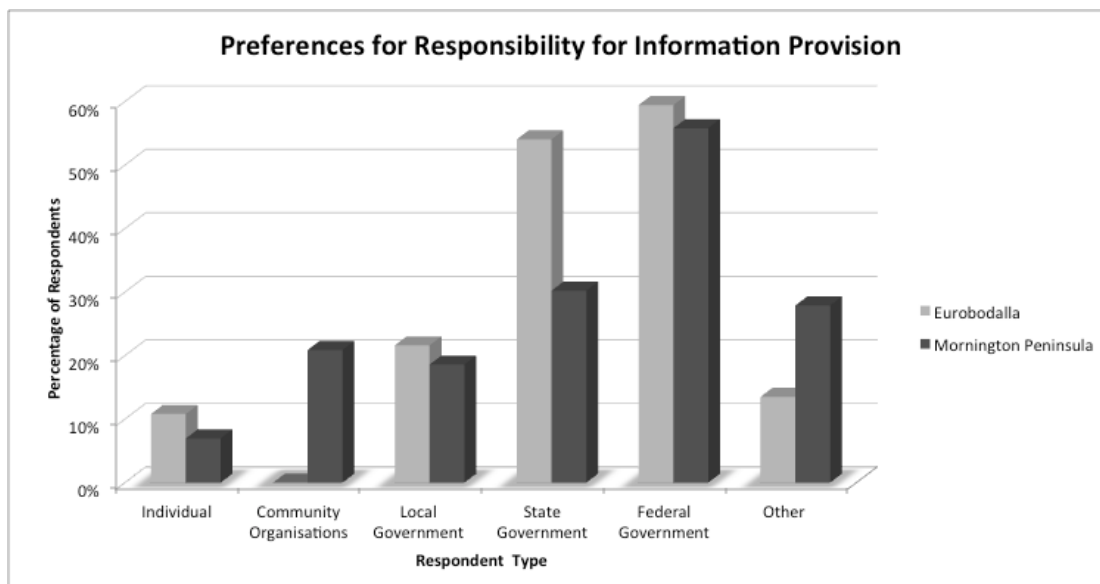


Figure 13: Respondents preferences for responsibility for information provision on the risks of sea level rise. Respondents were able to choose more than one category.

Much of the justification for federal government undertaking information provision and creation was based on the scale of the problem. Many respondents argued that sea level rise posed a risk to the whole nation's coastline, and therefore decision-making should be informed by the national governing body.

The Federal Government, simply because I don't believe we should have six states and two territories each producing their own little project to disseminate that information. I think that is double handling that could be avoided. Interview 10 Eurobodalla

I think if we see an overall sea level rise it's not only going to affect one particular state. It's not going to affect Victoria only or the Peninsula only. It's going to affect every bit of the coastline of Australia. The effects on different parts are going to be different but I think it's an Australia-wide issue. Interview 46 Mornington Peninsula

Some respondents indicated that a national standard was needed for information to inform adaptation planning for sea level rise.

There's no national standard for mapping coastal hazard and coastal risk. It comes down to how each consultant likes to present their maps or how each local government likes to do it. We need a sort of national standard on how the community can look at the final end product of science. Interview 2 Eurobodalla

An alternate argument for federal government responsibility for information provision came from the desire to avoid what was perceived as politically driven information creation in local and state government. Many believed state and local governments were exposed to rent seeking influences from external interest groups, particularly developers, whereas the federal government was able to better maintain impartiality.

Well certainly my experience in the last ten years of dealing with State Government you can see that it is just ideologically driven and at the moment is pretty much subject to whoever's got the most influence at the time. Interview 38 Mornington Peninsula

Well, the federal government is the only one without a close vested interest, in my opinion. My experience here is that all coastal decisions are influenced by vested interests, whether it's on the state level or the local council level. Interview 43 Mornington Peninsula

For a large number of respondents their preference for federal government responsibility for information came down to capacity. They believed local and state governments did not have the budget or resources to develop expertise and properly inform decisions on adaptation to sea level rise.

Well because they've got the money. More than the local government has. It's as simple as that. There are people there who are dedicated to do that sort of thing, but in local government there's not. Interview 39 Mornington Peninsula

For those who preferred State government to have responsibility for information provision, the justification related to scale and local knowledge. They believed that state government had a better capacity than federal government to provide information that was locally relevant while ensuring the compatibility of information across the state.

I'd really say state government. Mainly because of the geography of all the states is so different. Federal government could put out some broad projections but each state would be much more aware of the problems of the geography of that state. Local government, while it does some wonderful work, people tend to argue with it or not believe it or take it to the state because they want a higher opinion. Interview 6 Eurobodalla

I'd agree, that it's the main people here who are responsible for putting out this sort of info - and finding out the information in the first place would be the state. It could have a much more balanced view for example from between different coastal communities; which if it was the local government, could depend upon who's got the most money and not really addressing the problem. Interview 18 Eurobodalla

Overall, despite some preference based on local knowledge justifications, Local Government was seen as too under resourced and vulnerable to local interest groups to be responsible for information provision.

Well, they're too close to it and they're too interested in delivering to their constituents at a local level, to see the bigger picture. They're sort of working on their next council election campaign. Interview 34 Mornington Peninsula

I don't think they have the expertise for a start. You have a few coastal planners, but in terms of the research and even understanding inundation and all that sort of stuff, it's a complex science, and I don't think that any of our council people would have any of that ability to make any assessments of storm surge. Interview 36 Mornington Peninsula

Again, financial capacity was another key reason.

If you're talking about this whole integrated coastal management, looking at coastal processes at a broader level, I think it's a bit ridiculous to be asking the least resourced level of government to essentially go out and purchase advice that's so critical to how we manage the coast. Interview 2 Eurobodalla

More people chose the other category in this question than any other question on responsibility. Some respondents, particularly in Mornington Peninsula, saw academic institutions such as universities as having a significant role to play in providing information on the risks of sea level rise.

Well I think private would be the most likely source of the valid information, places like the unis and what have you. People who study those things, climatologists and scientists are well placed to be able to evaluate analytically and in factual ways what's actually happening. Whereas a politician is probably

more likely to seize upon whatever is the hot topic at the time. I mean you just look at the global warming debate, it's very confusing for the general public to know now what's fact and what's fiction. So much misinformation is peddled as truth. Interview 37 Mornington Peninsula

Advocating for a role for academic institutions was often linked to criticism of the ability of government at all levels to produce credible information in the face of political pressures.

I think local, state and federal governments are more and more involved with getting voted in and not acting on anything. I think they're the most disempowered groups of people now. I don't see them having the power that they should. I believe that an academic approach to it - just looking at the bare facts of what is happening and what should be done. Without interference or funding from dependent people who might benefit from providing that funding. Interview 51 Mornington Peninsula

Overall, responses to this question showed a strong preference for a role for the top two tiers of government due to the scale and cost of the task of information provision for adaptation to sea level rise. Despite this preference there was significant concern about the credibility of information coming from government due to the perceived influence of rent seeking and politics. Academic institutions were seen to have a role in mediating this issue of credibility with funding coming from federal and state governments.

5.5.5 Preferences for Responsibility for Managing Public Assets

Q: 'Who do you think should be responsible for making decisions about the risk of sea level rise to public assets in the local area (eg roads, beaches, parks and gardens)?'

Identifying preferences for responsibility for managing public areas can contribute towards any attempt to clarify roles and responsibilities across levels of government. Currently public assets are managed by a raft of different actors including various government agencies, community organisations and individuals. In comparing study sites there was considerable variation in the way public coastal areas were managed and these differences were reflected in preferences of the two sites.

Respondents identified the widely held concern regarding inconsistencies in management across jurisdictions and the difficulties which can arise from this, but generally valued the benefit of local government decision making, particularly in the local area.

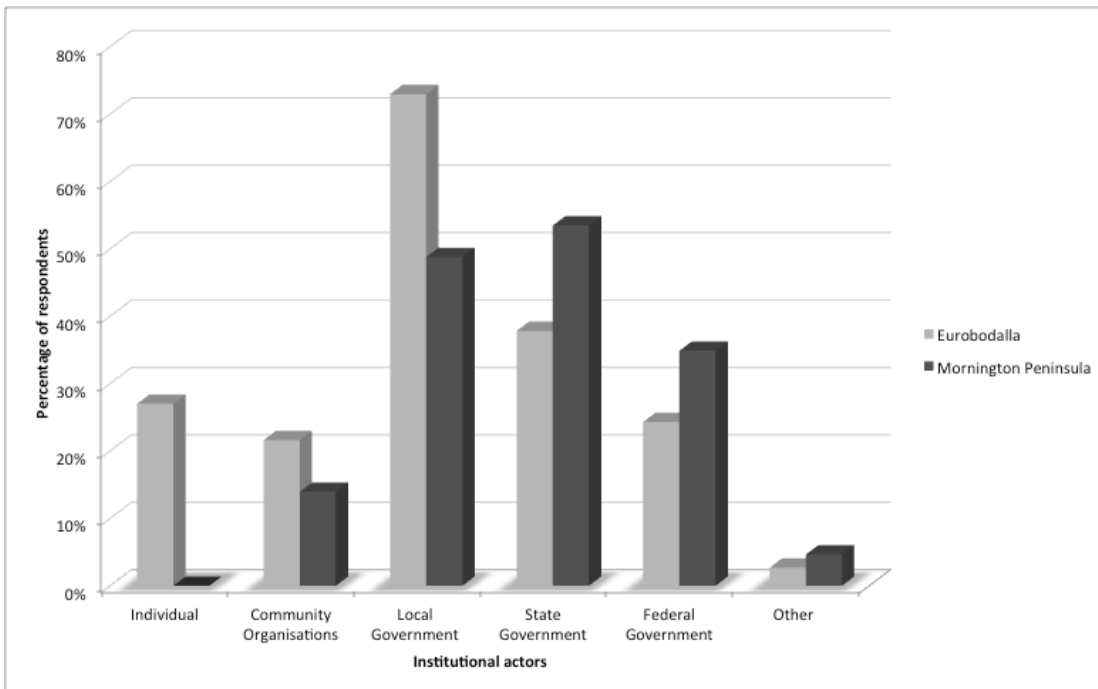


Figure 14: Respondents preferences for responsibility for managing public assets for adaptation to sea level rise. Respondents were able to choose more than one category.

Local Government was seen as the primary responsible entity for decision-making for public assets. In most cases this came down to the belief that public asset management requires a sound knowledge of local environmental conditions and the specific coastal issues faced by different LGAs.

'They're the only ones that know their local area and the situations, the winds, the tides, the weather events. The local government's the only one's got a real handle on what's happening up and down our coast.' Interview 19 Eurobodalla

'So it has to be local government because in theory they're the coalface government. The closest to the problem. Federal government is the most removed from the problem and state government seems to just write ridiculous policies from Leichhardt.' Interview 23a Eurobodalla

Many respondents were happy to see management and decision making for public assets remain with whichever government agency is presently responsible.

'Probably the agencies that manage them like Parks Victoria. Parks Victoria manage piers and jetties and things like that. So obviously they're best to be able to determine the risks. Committees of management in councils in association with DSE I would think so yes.' Interview 45 Mornington Peninsula

'Well to me the public assets here are owned by the local government and used by the community. So I think those two in cooperation, the local government and the community organisations.' Interview 1 Eurobodalla

While most respondents did prefer responsibility for public assets to fall mainly to Local Government there was recognition of issues with coordination and financial capacity.

'There certainly is a role for Government. I don't have a problem with local government having that, provided it's co-ordinated through all local government areas. You don't want to see one local government applying one set of criteria.' Interview 24 Eurobodalla

'I'll make this point: that if I was to answer the question local government, then you're going to get an enormous variation in the extent of which the assets are protected because some local governments have got a much more robust income stream than others.' Interview 24 Eurobodalla

The issue of variations across local government jurisdictions led some to believe public assets had to be managed at a state level.

'Well I suppose it has to be done at state level and local government would have some responsibility. I think there needs to be uniformity along the coast. It's no good one little local government doing one thing and another neighbouring one doing something different.' Interview 5 Eurobodalla

Like responsibility for information provision, some interviewees believed the approach to public asset management should be set at a federal level and implemented by the states and local governments. For example, with respect to even a basic issue like sea-level rise benchmarks, one respondent commented:

'State by state is going to be a bloody disaster. Inevitably they'll be people saying - up at Byron Bay we reckon it's going to be one and a half metres. Queensland reckons it's not going to happen at all. So you just can't have that sort of false horse-trading with politics. To me it's got to be a federal - local government alliance.' Interview 12a Eurobodalla

The community run Coastal Management Committee model in Mornington Peninsula Shire again influenced how people saw the role of community organisations.

'We are not that keen on the local government managing the foreshores. If you look at Dromana and you go down to Capel Sound a bit further down, they actually have foreshore committees of management managed by the community in association with either Parks Victoria or the department. In our view, that seems to work better.' Interview 36 Mornington Peninsula

Interestingly there was some preference for private individual involvement in public asset management from interviewees in Eurobodalla. This was most often explained by a desire to have public/private partnerships to encourage engagement in management from landowners adjacent to coastal public land.

'I would like to see property owners encouraged to look after that area (public land), rather than saying we'll we're going to fence it off and if you don't do this, that and the other we'll put up a big screen so that you can't see anything. I

would rather get property owners on side and get them to help look after the area.’ Interview 8 Eurobodalla

Overall these results suggest a preference for a strong role for local government in the management of public assets for adaptation, which is an extension of their current role in coastal management. The interviewees indicated that this responsibility would need to be supported with funding and coordination from higher levels of government; the preference here was for State government.

5.5.6 Preferences for Responsibility for Managing Private Assets

Q: ‘Who do you think should make decisions about the risks of sea level rise to private property in the local area?’

One of the most contentious aspects of responsibility for adaptation to sea level rise is the issue of how responsibility should be distributed when making decisions about the management, location and potential relocation of private assets and private property. Potential conflict between individual property rights and the larger objectives of planning and government regulation is a barrier that has been identified in this project. This question aimed to investigate preferences for responsibility for private assets as well as discuss the difficult issue of where private responsibility stops and public responsibility begins.

There was a solid preference for individual responsibility for decision-making on private assets in both Eurobodalla and Mornington Peninsula. Both of the case study sites also showed strong support for local government responsibility. As with two of the other questions in this section of the interview state government was preferred by a higher proportion of interviewees in Eurobodalla than in Mornington Peninsula. Community organisations received a very small percentage of preference and no interviewee nominated the other category in this question.

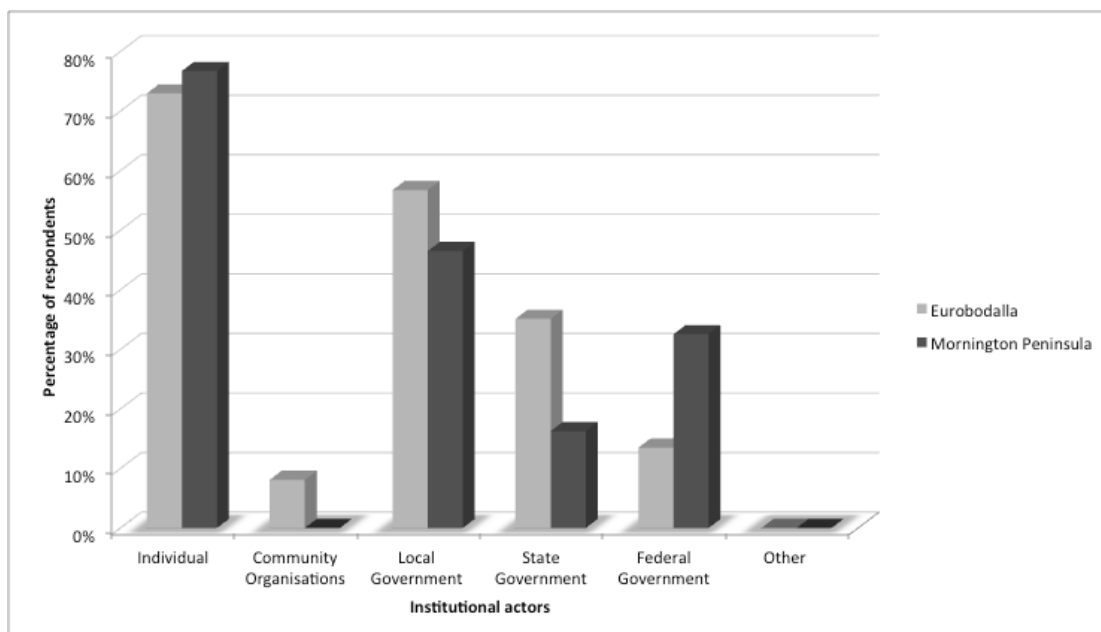


Figure 15: Respondents preferences for responsibility for managing private assets for adaptation to sea level rise. Respondents were able to choose more than one category.

Significantly, very few respondents saw the individual as the sole responsible party separate from or above government authority; most made it clear that home owners rights should fit within a wider government regulated context. The most commonly identified combination of responsible parties was between individuals and local government.

'The individual property owner has to determine what's best and what they are willing to pay for and endure from the point of view of risk. But they have to work within some sort of framework otherwise it will get out of hand, so I guess government, yes, probably local or state government, would have to set policy at least as to what people can and can't do.' Interview 37 Mornington Peninsula

'I think it's up to the owners to have that risk. But councils will put in rules and guidance and zones, to say this is affected by, or could be affected by and you're at risk of. But after that I think it's up to the property owner to decide well will they heed that risk.' Interview 1 Eurobodalla

'I think it has to be largely up to the private property owner, because they are the owner, and then perhaps there's guidance from community groups, local government, State Government and so forth. Doing anything about individual properties has to be collaborative. I think it would be best to come in the form of guidelines and presenting a fair and balanced view of risks.' Interview 11 Eurobodalla

A good number of respondents believed the federal government should be responsible for establishing residential coastal development policy, which could regulate private

decision making on private property (even though this is presently a state government responsibility).

'I think there's got to be a nationwide policy on it, but I think there needs to be some room for movement so that local government can tweak it a bit. A little bit like normal planning policies - there can be an argued local deviation from a template.' Interview 12 Eurobodalla

'Well, I think if you have the right federal government foreshore management policies or whatever you would call them, that local governments have to live with them and that solves a problem.' Interview 50 Mornington Peninsula

A pervading concern in regards to local government planning laws was the inconsistencies in regulation between councils. Many saw federal government as being responsible for handling this aspect of responsibility for private property.

'There was such an uproar about that - because people thought their properties were being devalued. Well, I think that's a thing of concern because if one council is doing it and then not doing it, and another council in similar circumstances is doing and then another one isn't, that sort of approach needs to be co-ordinated and needs to be applied with some sort of force, I think.' Interview 24 Eurobodalla

'Yeah. In essence, the problem lies with if every council goes to a different consultant you're going to have a hotchpotch system.' Interview 27 Eurobodalla

Despite the popularity of the model of private risk responsibility within a government regulated environment, precisely where government responsibility stops and individual responsibility starts remained an incongruous issue.

'Yeah, it becomes a private issue. I agree with planning overlays in this area, but for the government to tell me I can't build a house on my own land because they have assessed the risk, well, it's none of their business if I want to take that risk. So I would say that the people should be able to do what they want to do. It's their property.' Interview 50 Mornington Peninsula

'So people aren't well enough informed to know how to protect their own property and those around them. What they do has an effect on somebody else. I think you have the right to defend your property within the law but I don't think you have a right to outsmart planning issues that have been put there as a science.' Interview 51 Mornington Peninsula

A reoccurring distinction based on knowledge of risk arose during the discussions around responsibility for private assets. Most respondents distinguished between decision making for existing private assets now, and the development of new dwellings in risk areas into the future.

'I'll break that up into two areas, I suppose. One is for established entities or houses or shops or whatever, very hard for the existing owners to manage the risk in any way or to be responsible for it. If you've got a vacant plot of land and

you want to build a house on it, then I think you've got to be to a degree responsible and weigh up the consequences of if you do it.' Interview 46 Mornington Peninsula

'As I was saying before, the properties that have been there for 50 years-plus where they weren't any reports available, that's got to be looked after by local government and state government. If you've had your reports done and it says that you're in an area of risk, it's on you. If you're foolish enough to do it [build], to tempt fate, well, I think you've got to be responsible for your actions.' Interview 28 Mornington Peninsula

Unlike other discussions around responsibility, private assets were seen to be the responsibility of only three groups; community organisations and the 'other' options were almost entirely ignored. Interestingly, despite recent planning controversies in both Eurobodalla and Mornington Peninsula shires, most respondents were happy to see local governments continue to remain the primary agency responsible for planning decisions in their local area. This preference for government regulation has significant implications for the viability of new legislation or regulatory tools to address the legal barriers to adaptation to sea level rise.

5.5.7 Preferences for Responsibility for Local Planning

Q: 'If there is to be a strategic plan on sea level rise for the local area, who should have responsibility for making that plan?'

Equitable, efficient and effective adaptation to sea level rise will require the ability for individuals, communities and governments to decide on and implement a range of adaptation options suitable to local contexts. Strategic planning at a local level is an essential part of adaptation in this context and confusion on the governance aspects of planning processes have been identified in this project as a key barrier to adaptation to sea level rise. While this question asked about *local* planning the majority of participants specified a preference for a combination of actors at different scales to have responsibility for planning.

Local government made up the largest proportion of preferences for responsibility for strategic planning, followed by state and then federal government. Community groups made up the largest percentage of preferences for responsibility in this question than in any other.

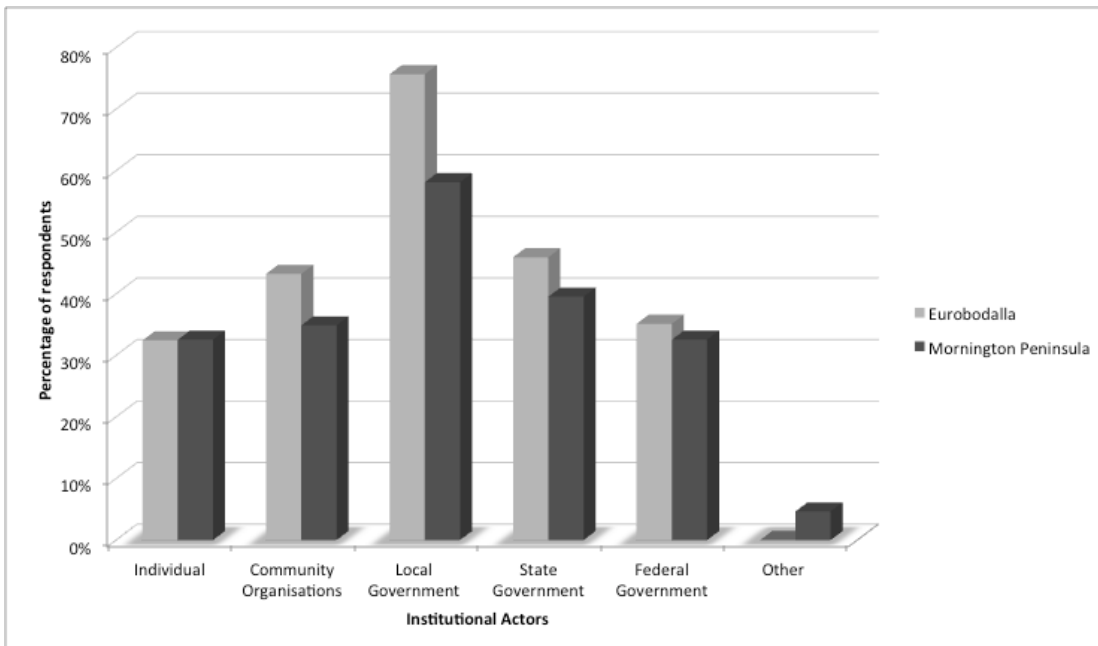


Figure 16: Respondents preferences for responsibility for local strategic planning for adaptation to sea level rise. Respondents were able to choose more than one category.

There was a stronger preference in this question for responsibility to be shared across groups than in any other question on responsibility. Very rarely did anyone see this as a role for any single agency or individual.

'Well, you would want local government, and you'd want community organisations, which would include private property owners. I would say that those two should do it, but that you need an impartial overseer to make sure that the strategic plan includes the inputs of all those people, not just the shire doing what they want to do.' Interview 50a Mornington Peninsula

'Well, the local government and the residents [should be responsible for a strategic plan] but there should be guidelines from state and federal government first. Strict, accurate guidelines, as accurate as possible according to scientists. Then the local government takes over because they are in charge. They have engineers and planners and they're the only people who know the terrain.' Interview 20 Eurobodalla

The federal government was often identified in order to provide a nationally uniform approach and avoid conflict in plans between local government areas. Many believed federal government involvement would empower, engage and provide direction for local governments on an issue struggling to find consistency and traction at the local scale.

'Well I really think the federal government is the only one that's got the overall oversight. I think we've just got to bypass local government and state governments and go with the central government and look at the big picture.'

It's not only Victoria that's affected by sea level rise. It's everywhere around Australia.' Interview 47 Mornington Peninsula

'In an ideal world, if they did the right thing, the place to do it is Federal Government, even though Mornington Peninsula is unique, when it comes to sea level rise, and global warming, it is a national issue. It's not a Mornington Peninsula issue.' Interview 50 Mornington Peninsula

While many respondents mentioned the state governments involvement in formulating a local plan, it was often in the context of an intergovernmental approach and rarely did anyone identify a specific reason why the state alone should be involved.

'There is a lot of Victoria that is under threat if the sea rises, so it should just be a format for that - for the whole of Victoria rather than having different balls for different local governments; it would be very confusing.' Interview 55a Mornington Peninsula

As may be expected, many saw local government playing a significant role in local planning given their familiarity with the local geographic issues and the local community.

'That's traditionally a local government role, I think that should stay with local government and the community because we're essentially the pointy end of sea level rise. When you talk about sea level rise and who it's going to impact, it all happens in small towns and small communities. I think strategic planning is something we do through our local environmental plans and things like that. That should stay in the local government but it should be supported with a stronger base of information.' Interview 2 Eurobodalla

The role of community organisations was identified more often in this question than any other question on responsibility. Much of the justification for this was based on a belief that community organisations are able to represent a range of local interests and are able to more effectively communicate local knowledge.

'More the local and the state governments deciding on what sort of plan. But getting involved the smaller organisations like Blue Wedges and at least discussing with them a strategy, and getting opinions from more sources so that they can make a better decision and look at things from different perspectives.' Interview 41

'It will come from residents and community groups because of the need to incorporate local knowledge which I think is often overlooked. I think quite often the big view down from academia and others is that there is a set of operating principles which really has not a lot to do with the local variances.' Interview 51 Mornington Peninsula

Many interviewees recognised a wealth of knowledge among their fellow residents and believed a local plan was the best place for this knowledge to be utilised.

'There's no doubt about local knowledge. That's relevant. Local people know more about it than somebody sitting in Spring Street or whatever because we're here. So yeah, there should be input from us.' Interview 47 Mornington Peninsula

The discussion of local planning recognised the need for collaboration across government, the utilization of local knowledge and the ways for community organisations to take part in informative and useful dialogue. This may provide an insight into opportunities to engage the public on adaptation to sea level rise and to incorporate community input into adaptation planning.

5.5.8 Preferences for Responsibility for Cost Bearing for Adaptation

Q: 'Implementing adaptation options, whether they be coastal protection or things like relocating assets, is going to cost money; who do you think should be responsible for bearing the costs of adaptation options?'

The potential costs of adaptation to sea level rise will vary depending on the adaptation options that are chosen for particular areas. Whatever choices are made, these costs are likely to be significant and a lack of clarity on which level of government or sector will be responsible for bearing these costs has been identified by this project as a key barrier to adaptation to sea level rise.

Preferences for responsibility for cost bearing were heavily weighted to federal government in both study sites, with over 90% of respondents in Mornington Peninsula believing federal government should bear some responsibility. Similarly state government was favored more frequently than local government in both study sites. The proportion of respondents who thought individuals should pay for adaptation was far greater in Eurobodalla than in Mornington Peninsula.

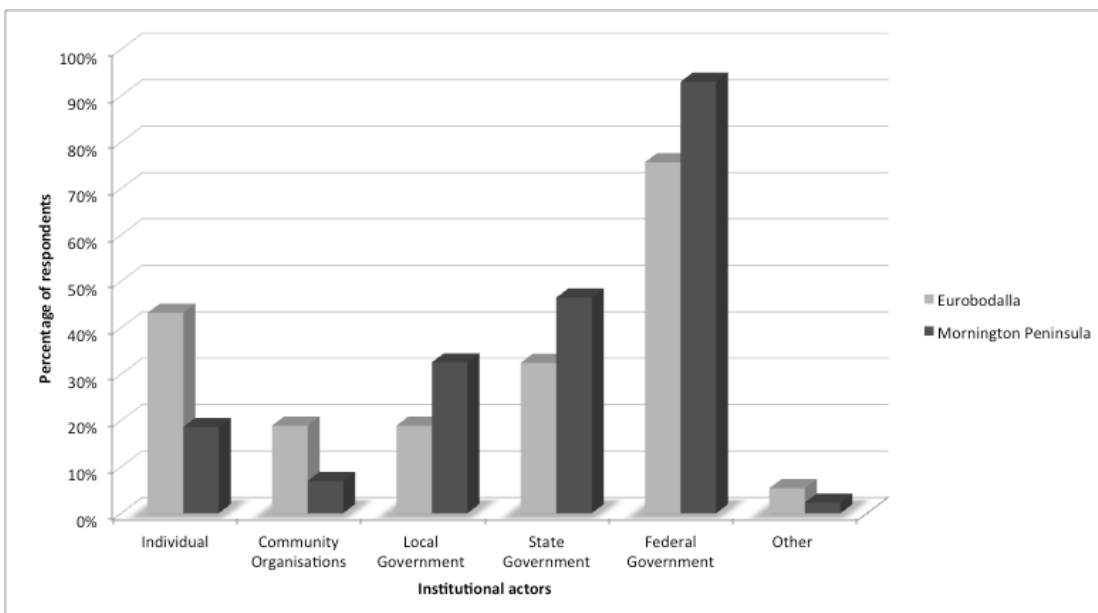


Figure 17: Respondents preferences for responsibility for bearing the costs of adaptation to sea level rise. Respondents were able to choose more than one category.

The discussion on who should bear the costs of adaptation to sea level rise was a nuanced one that, in many cases, took up a significant portion of the interview. There were several reasons that federal government were seen to be the primary responsible entity for funding adaptation; the main reason being that they are the only entity that have the capacity to raise the revenue necessary to cover the considerable costs.

'The Federal Government because they've got the coffers, they've got the GST, they've got the whole lot. I mean, it would have to come from Federal Government. It would have to...' Interview 35 Mornington Peninsula

'Well I suppose when it's a really important asset like a town, for example, then maybe some funding is going to come from the Federal Government because no one else has got the resources when it all boils down.' Interview 4 Eurobodalla

There was recognition by a majority of interviewees that the nature of federal taxation means that all residents of Australia will be contributing financially if money comes from the federal government. For many this idea of collective responsibility was seen to be fair considering that federal taxes are used to pay for things like flood and bushfire recovery and drought assistance.

'I suppose it's everyone's responsibility for the fact that we're all pushing the boundaries to some extent when it comes to Mother Nature, whether we're running a million cattle on two million acres and expecting assistance from the government, to help survive. Well, if Farmer Pat's getting a million bucks every year to keep his farm running, well I'm paying for that and I don't live anywhere near him. So yeah, I think what goes around comes around so if we're helping them I think they should be expected to help us.' Interview 28 Mornington Peninsula

'Well, I think probably most people should be paying. Regardless of your beliefs, it's like everything - whether you believe in Labour or Liberal, one of them is going to be in government and they're going to make you pay for something you don't agree with necessarily.' Interview 11 Eurobodalla

'It's a collective, yes. At the end of the day everyone chips in. The same with our sewage system, our roads, everyone chips in.' Interview 27 Mornington Peninsula

As with other elements of responsibility some respondents justified a federal government responsibility for cost bearing based on the scale of the risk.

'The federal government, well it would be Australia wide. I mean if Dromana was inundated so would Rosebud and Byron Bay and Cairns, right up the coast.' Interview 60 Mornington Peninsula

At the other end of the spectrum there was some argument from interviewees, albeit a small proportion, that local government should be the lead agency responsible for funding adaptation options. This position was based on a proposition that local

governments collect a significant amount in rates from beachfront property owners and that money should be used to fund protection or relocation options.

'We are charged for the benefit of living on the water, by paying extra in rates. We pay at least double what someone would pay on the opposite side of the street. So, therefore, we feel that we pay the rates to the council, they should also look after us in times of need.' Interview 16a Eurobodalla

'If the local government has benefited largely by the rates that they impose on some of these coastal properties - Which are extraordinary - 60,000 a year some of them - it's huge. So if they have benefited from that then they in part could act responsibly and pay some of that back. They obviously don't provide any more services for those properties.' Interview 51 Mornington Peninsula

For those that preferred a combination of state and federal the choice was based on capacity and the belief that local government is incapable of funding the significant projects sea level rise would necessitate.

'It's got to be federal-state funding. It can't be left to local government. It's too fragmented and too small and there's not enough residents. I think a partnership [between state and federal] probably would work well but that's one of the things that this country just doesn't do very well.' Interview 33 Mornington Peninsula

For many there was a belief that the private sector and private property owners also had some responsibility to cover the costs of damage or adaptation options that impacted their assets but that this should be a proportion of a collective effort to bear the costs.

'In that sort of situation it's going to have to be everyone who's going to have to foot the bill. The property owners, the local government, the state government and federal government - they're all just going to have to chip in.' Interview 15 Eurobodalla

'I think that the adaption should be a combination of private and state money, because local government will be paying for it anyway in the sense that they will be renewing infrastructure... So the greater community has to look after those at risk from what they don't know, but also the private sector has a responsibility to play, because they choose to put themselves in potentially a vulnerable situation, and therefore I think they have a responsibility to look after their own safety, to a certain extent.' Interview 6 Eurobodalla

Some interviewees, the majority from Eurobodalla, believed that those individuals at risk should be paying. In most cases this was based on the idea that owning a property is a financial risk that is not a public responsibility.

'Depends what assets you're protecting. I think where it's private assets, I think the private property owner has to take responsibility for their own actions. I don't think public money should be spent improving the asset value of private property. Public money should be spent on protecting the general coastal

landscape and the general community interest, not individual properties.'
Interview 30 Mornington Peninsula

'I think again there's an interest in your private property, so you've got to bear some of that. I think you'd bear some of that cost yourself. You couldn't just shelve it off to government, because you can always make choices about moving' Interview 17 Eurobodalla

Overwhelmingly the interviewees in both study sites had a preference for federal government to bear the costs of adaptation options. Perhaps more than any other question, this one resulted in complex discussions about the nature of individual and collective responsibility, the practicalities of adaptation and issues of fairness and efficiency when it comes to dealing with sea level rise.

6. CONCLUSIONS

6.1 *Barriers to Adaptation to Sea Level Rise*

Our analysis of barriers in this project offers a number of conclusions for adaptation research and policy. In terms of research, we draw two major conclusions. First, the evidence from submissions to the Productivity Commission's inquiry into *Barriers to Effective Climate Change Adaptation* helps to consolidate the existing knowledge on barriers to adaptation reviewed earlier in this paper: governance, uncertainty, psychological and cultural factors, and resources matter to those actors in Australia that are engaged in adaptation. Our typology advances understanding about barriers as it is informed by detailed data from a wide sample of actors from multiple sectors, and the categories of barriers that have emerged are sufficiently distinct, and logically consistent.

Second, based on the data in Figure 7, it seems that researchers may misunderstand what it is that decision makers want to know. Despite the fact that governance and policy were seen to be major concerns by decision maker respondent groups (government and industry), the researchers that made submissions to the inquiry do not consider governance to be a major barrier to adaptation. Instead the academic group considered uncertainty to be most important barrier. Knowledge about issues such as the de facto situation with respect to the governance of adaptation; preferences for the distribution of roles and responsibilities for adaptation between levels of government and sectors; and the risk of liability for negligence for failing to act on adaptation, or for the costs of adaptation is, to most decision makers, more important than the concern of academics to reduce uncertainties in climate models. This suggests that the shift in emphasis from researching climate impacts to adaptation is not yet complete, at least in Australia (Burton et al. 2002)

We also draw two important implications for adaptation policy from our analysis. First, as Figure 7 shows, the groups that made submissions prioritized barriers differently according to the sector in which they operate. For example, because academics are in the business of reducing uncertainty they prioritize this as a barrier; community organisations and NGOs are typically underfunded, and so prioritize resources highly; and local governments, who are policy takers more than makers, prioritise clarity with respect to governance and policy. Nevertheless, some barriers are generally more important than others, with ambiguity about governance and policy being important barriers to most groups of respondents, as well as the categories in which there was the most specification of discrete issues (see Table 1). Thus, there is a strong message coming from the majority of respondent groups; that adaptation first and foremost requires clear governance arrangements, and appropriate policy and legislation to implement change. The impediment to adaptation therefore isn't uncertainty about what to, but rather, now knowing who is to do whatever needs to be done.

The second implication of our analysis for adaptation policy is that there is a sequence to action to enable adaptation, at least in Australia. The focus must first be on governance: put simply, actors need to know what they are responsible for, and what is

to be left to others. This suggests a contract of sorts, where the division of roles and responsibilities among levels of government, and between sectors, is clarified. Secondly, then, these actors need statements of purpose and statutory support to begin to act. Once these institutional preconditions are in place, uncertainty about risks and responses can be addressed in a more purposeful way, there can be a better assessment of the resources needed to adapt, and psychosocial factors can be tackled. This strongly implies a central role for government in adaptation efforts (at least initially), rather than it being left up to the autonomous actions of individuals and sectors.

6.2 Responsibility for Adaptation to Sea Level Rise

As a starting point on what a contract of distributed responsibility for adaptation might look like we investigated the preferences of 80 people from two case study sites, representing the key groups for which the outcomes of this contract will matter to most; home owners, business owners and local coastal managers. The interviews provided a rich data source with which to explore this issue; the subject was one that people were able to articulate opinions and preferences in detail.

Separating the questions on responsibility into key adaptation tasks confirmed that people preferred different levels of government or sectors to be responsible for different aspects of adaptation. In other words, our results suggest that the community at large does not expect or want adaptation to be a conglomerate responsibility of one sector or level of government. There is recognition that adaptation to sea level rise should be a shared responsibility, however, rather than that being a throw away phrase, the results demonstrate sophisticated expectations and preferences of how that responsibility should be distributed and why.

The Productivity Commission analysis suggested that uncertainty about community support for specific policy choices is also a barrier to adaptation. Our results point to some overarching preferences across key groups in the community for different types of policy options. Both the general opinions on adaptation options and highest priority results suggest strong support for land use planning options for adaptation to sea level rise. There is some opposition to these land use planning options including the perceived right of property owners to make decisions about risks and the fairness and efficacy of relocation without compensation, however the opposition is outweighed by support across the 80 interviews. Engineering options like hard coastal protection attracted the largest amount of opposition and the least preference as a priority option in Mornington Peninsula.

There were a number of concepts that explained the choices of participants in both the policy options and who should be responsible for what. These included; fairness and equity, cost effectiveness and capacity and efficacy of the governing entity. As these concepts have emerged from discussions on community preferences it could be said that these could function well as principles for addressing barriers and negotiating responsibility for adaptation. There is scope for more analysis on this issue.

Overall the interviewees indicated a strong preference for a significant role for government in all aspects of adaptation to sea level rise. Respondents saw

responsibility for adaptation tasks as being either weighted to local or federal levels for quite different reasons. When expressing preferences for local government, justifications revolved around the importance of local knowledge and the value of having responsible authorities in close proximity to the local impacts of sea level rise. Justifications for federal government responsibility centered on capacity to undertake adaptation and a view that distance from the local politics of adaptation gave legitimacy and credibility to federal adaptation planning. Very few saw the state government as having a primary role. In responses where combinations of entities were given, the state government had a facilitating role, a secondary funding responsibility or a responsibility for coordination of plans and policies across local government areas. Even though the questions were framed in hypotheticals and were asking for normative judgments on who should be responsible there was some bias to the way that responsibility for public policy is currently distributed.

Due to the scale and cost of information provisions for adaptation to sea level rise the participants showed a strong preference for responsibility to be taken by the top two tiers of government. Alongside this preference however, there was significant concern about the credibility of information coming from government due to the perceived influence of rent seeking and politics. Academic institutions were seen to have a role in mediating this issue of credibility with funding coming from federal and state governments.

The results found a preference for a strong role for local government in the management of public assets for adaptation, which is an extension of their current role in coastal management. The interviewees indicated that this responsibility would need to be supported with funding and coordination from higher levels of government; the preference here was for State government.

Preferences for responsibility for managing private assets favoured a combination of individual responsibility with government regulation, reflecting current de facto responsibility arrangements in this aspect. Interestingly despite recent planning controversies in both Eurobodalla and Mornington Peninsula shires, most respondents were happy to see local governments continue to remain the primary agency responsible for planning decisions in their local area. This preference for government regulation has significant implications for the political will to implement new legislation or regulatory tools to address the legal barriers to adaptation to sea level rise.

Preferences for local planning favoured local government overall but recognised the need for collaboration across government, the utilization of local knowledge and the ways for community organisations to take part in informative and useful dialogue. This may provide an insight into opportunities to engage the public on adaptation to sea level rise and to incorporate community input into adaptation planning.

Overwhelmingly the interviewees in both study sites had a preference for federal government to bear the costs of adaptation options. Perhaps more than any other question, this one resulted in complex discussions about the nature of individual and collective responsibility, the practicalities of adaptation and issues of fairness and efficiency when it comes to dealing with sea level rise.

Future research opportunities

For the purposes of this project and in the interests of value for end users, we have analysed this data at a high level, for the most part comparing only across study sites. There is scope however for much more detailed examinations of possible explanatory variables in the data. Specifically, by targeting the sample to groups that had similar stakes or interests in adaptation we have data that could investigate the role that self-interest plays in preferences for options and responsibility for adaptation to sea level rise.

At a broad level there is a clear need for policy makers to begin working on how responsibility might be distributed for adaptation to climate change, the institutional settings that will encourage effective, equitable and efficient distribution of responsibility and the legislative requirements to support those settings. The findings of this research are designed to provide some evidence on community expectations and preferences for this process. This is useful because it gives an indication of the types of regimes of responsibility that different groups would find acceptable. As policy makers begin to form adaptation policies in Australia there is an opportunity to incorporate these findings, undertake more comprehensive research into community preferences and develop, with policy makers, a framework for negotiating responsibility for adaptation to sea level rise across levels of government and sectors.

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APPENDIX 1: INTERVIEW SET

LOCAL GOVERNMENT

<p>Current State of Roles and Responsibilities for coastal management <i>Intro: The first section of this interview is about the current state of coastal management in the area</i></p>
<p>1. Can you tell me about your role here at council? –</p>
<p>2. What are the main coastal management issues that local government is dealing with now? –</p>
<p>3. Are there issues that are likely to become bigger in the future? –</p>
<p>4. What role does local government play in dealing with these issues? Are there particular responsibilities that local government has? –</p>
<p>5. What role do other levels of government play in dealing with these issues? – <i>Prompt: Does state government have particular responsibilities?</i> – <i>Prompt: Does federal government have particular responsibilities?</i> –</p>
<p>6. At the moment, do private property owners play any role in coastal management? –</p>
<p>7. What about community organisations like landcare or others, do they have roles? –</p>
<p>8. Thinking about coastal management in this area, Are there things that are working well? –</p>
<p>9. Are there things that are not working well? –</p>
<p>The impact of sea level rise and adaptation planning on responsibilities <i>Intro: “Some researchers and policy makers have suggested that the risk of sea level rise may change the mix of who is responsible for things like decision making, risk management and bearing the costs of adaptation options...”</i></p>
<p>10. Firstly, how do you imagine sea level rise impacting this area? – <i>Prompt: Timeframes? Level of impact?</i> –</p>
<p>11. Thinking about the local area, do you think there are specific things or places at risk from sea level rise? –</p>
<p>12. What do you think will need to be done to deal with these risks and adapt to sea level rise? –</p>

13. Is the risk of sea level rise or adaptation planning processes **already changing the roles and responsibilities** of local government?
- If no – Why not? Does it have potential to do so in the future?
 - If Yes – How? Do you have any local examples? How is local government dealing with these changes?
 -

Preferences for the distribution of responsibility

Intro: “Eurobodalla/Westernport region is already starting to plan for adaptation to sea level rise. With that in mind, the last stage of this interview is about your preferences for how responsibility for adaptation to sea level rise should be distributed across different levels of government, private property owners and community organisations.”

*I’m going to give you this **card** that outlines some of the groups that could have roles or responsibility for planning and ask a series of questions about who you think should be responsible for different things. There might be others that you can think of, it’s just a guide...*

14. Who do you think should be **providing information and creating knowledge** on the risks of sea level rise?
- Local government
 - State government
 - Federal government
 - Private property owners
 - Community organisations
 - Combination?
 - Other?
- Can you explain why? *Prompt: What might this depend on?*
-

15. Who do you think should make decisions about the risks of sea level rise to **public assets** in the local area (eg roads, beaches, parks and gardens)?
- Local government
 - State government
 - Federal government
 - Private property owners
 - Community organisations
 - Combination?
 - Other?
- Can you explain why? *Prompt: What might this depend on?*
-

16. Who do you think should make decisions about the risks of sea level rise to **private property** in the local area?
- Local government
 - State government
 - Federal government
 - Private property owners
 - Community organisations
 - Combination?
 - Other?
 -

<p>17. If there is to be a strategic plan on sea level rise for the local area, who should have responsibility for making that plan?</p> <ul style="list-style-type: none"> - Local government - State government - Federal government - Private property owners - Community organisations - Combination? - Other? <p>Can you explain why? <i>Prompt: What might this depend on?</i></p>
<p>1. Implementing adaptation options, whether they be coastal protection or things like relocating assets, is going to cost money; who do you think should be responsible for bearing the costs of adaptation options?</p> <p>18.</p> <ul style="list-style-type: none"> - Local government - State government - Federal government - Private property owners - Community organisations - Combination? - Other? -
<p>Conclusion Intro: "Thank you for your time today..."</p>
<p>19. Is there anything you would like to talk about that we haven't covered in the interview?</p> <p>-</p>
<p>Demographics sheet</p>

COMMUNITY ORGANISATION GROUP LEADERS

<p>Current State of Roles and Responsibilities for Coastal Management</p>
<p>2. Firstly, can you tell me a bit about your organisation and what it does?</p> <p>-</p>
<p>3. Our study is interested in coastal management in this area, what do you think are the big issues for coastal management here?</p> <p>-</p>
<p>4. Does your organisation have a role in these issues?</p> <p>- <i>Prompt: Does it have any particular responsibilities?</i></p> <p>-</p>
<p>5. Who do you think are the key organisations or levels of government that have responsibility for coastal management?</p> <p>-</p>

<p>6. Thinking about coastal management, are there things that are working well?</p> <p>–</p>
<p>7. Are things that are not working well?</p> <p>–</p>
<p>The impact of sea level rise and adaptation planning on responsibilities <i>Intro: “Some researchers and policy makers have suggested that the risk of sea level rise may change the mix of who is responsible for things like decision making, risk management and bearing the costs of adaptation options...”</i></p>
<p>8. Firstly, how do you imagine sea level rise impacting this area?</p> <p>– <i>Prompt: Timeframes? Level of impact?</i></p> <p>–</p> <p>– <i>If no impact: Can you explain?</i></p> <p>– <i>Intro: The rest of the interview is about who should do what to manage the risk of sea level rise. Government is attempting to put policies in place to deal with sea level rise so it’s important for us to get your views about that process even if you don’t think sea level rise is a threat. If you’re happy to, I’ll continue with the interview with that in mind?</i></p> <p>–</p>
<p>9. Thinking about the local area, do you think there are specific things or places at risk from sea level rise?</p> <p>–</p> <p>– <i>Do you think that other coastal processes such as erosion or storm damage might pose a risk to specific things or places in the area?</i></p>
<p>10. What do you think will need to be done to deal with these risks and adapt to sea level rise?</p> <p>–</p> <p>– <i>Do you think anything needs to be done about sea level rise?</i></p>
<p>11. Is the risk of sea level rise or adaptation planning processes already impacting the work of your organisation?</p> <p>– <i>If no – Why not? Does it have potential to do so in the future?</i></p> <p>– <i>If Yes – How? Do you have any examples?</i></p> <p>–</p>
<p>Preferences for the distribution of responsibility <i>Intro: “Eurobodalla/Westernport region is already starting to plan for adaptation to sea level rise. With that in mind, the last stage of this interview is about your preferences for how responsibility for adaptation to sea level rise <u>should</u> be distributed across different levels of government, private property owners and community organisations.”</i></p> <p><i>I’m going to give you this card that outlines some of the groups that could have roles or responsibility for planning and ask a series of questions about who you think should be responsible for different things. There might be others that you can think of, it’s just a guide...</i></p>
<p>12. Who do you think should be providing information and creating knowledge on the risks of sea level rise?</p> <ul style="list-style-type: none"> – Local government – State government – Federal government – Private property owners

- Community organisations
 - Combination?
 - Other?
- Can you explain why? *Prompt: What might this depend on?*
-

13. Who do you think should make decisions about the risks of sea level rise to **public assets** in the local area (eg roads, beaches, parks and gardens)?
- Local government
 - State government
 - Federal government
 - Private property owners
 - Community organisations
 - Combination?
 - Other?
- Can you explain why? *Prompt: What might this depend on?*
-

14. Who do you think should make decisions about the risks of sea level rise to **private property** in the local area?
- Local government
 - State government
 - Federal government
 - Private property owners
 - Community organisations
 - Combination?
 - Other?
-

15. If there is to be a **strategic plan** on sea level rise for the **local** area, who should have responsibility for making that plan?
- Local government
 - State government
 - Federal government
 - Private property owners
 - Community organisations
 - Combination?
 - Other?
- Can you explain why? *Prompt: What might this depend on?*

16. Implementing adaptation options, whether they be coastal protection or things like relocating assets, is going to cost money; who do you think should be **responsible for bearing the costs** of adaptation options?
- Local government
 - State government
 - Federal government
 - Private property owners
 - Community organisations
 - Combination?
 - Other?

Can you explain why? <i>Prompt: What might this depend on?</i> –
Conclusion <i>Intro: “Thank you for your time today...”</i>
17. Is there anything you would like to talk about that we haven't covered in the interview? –
Demographics sheet

BUSINESS OWNERS

Current State of Roles and Responsibilities for Coastal Management
1. Can you tell me a bit about your business ? – <i>Prompt: How long have you been here? What does your business do?</i> –
2. Our study is interested in the coast and coastal management, how important is the coast to your business? –
3. What would you say the big issues are for coastal management in this region? –
4. Does your business have a role or any responsibilities in these issues? –
5. Who are the key organisations or levels of government that have responsibility for coastal management? –
6. Thinking about coastal management in this area, are there things that are working well ? –
7. Are there things that are not working well ? –
The impact of sea level rise and adaptation planning on responsibilities <i>Intro: “Some researchers and policy makers have suggested that the risk of sea level rise may change the mix of who is responsible for things like decision making, risk management and bearing the costs of adaptation options...”</i>
8. Firstly, how do you imagine sea level rise impacting this area? <i>Prompt: Timeframes? Level of impact?</i> – – <i>If no impact: Can you explain?</i> – <i>Intro: The rest of the interview is about who should do what to manage the risk of sea level rise. Government is attempting to put policies in place to deal with sea level rise so it's important for us to get your views about that process even if you don't think sea level rise is a threat. If you're happy to, I'll continue with the interview with that in mind?</i> –

9. Thinking about the local area, do you think there are **specific things or places at risk** from sea level rise?

–

– *Do you think that other coastal processes such as erosion or storm damage might pose a risk to specific things or places in the area?*

–

10. What do you think **will need to be done** to deal with these risks and adapt to sea level rise?

–

– *Do you think anything needs to be done about sea level rise?*

–

11. Is the risk of sea level rise or adaptation planning processes **already impacting** the way you run your business?

– *If no – Why not? Does it have potential to do so in the future?*

– *If Yes – How? Do you have **any examples**?*

Preferences for the distribution of responsibility

Intro: “Eurobodalla/Westernport region is already starting to plan for adaptation to sea level rise. With that in mind, the last stage of this interview is about your preferences for how responsibility for adaptation to sea level rise should be distributed across different levels of government, private property owners and community organisations.”

*I’m going to give you this **card** that outlines some of the groups that could have roles or responsibility for planning and ask a series of questions about who you think should be responsible for different things. There might be others that you can think of, it’s just a guide...*

12. Who do you think should be **providing information and creating knowledge** on the risks of sea level rise?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

13. Who do you think should make decisions about the risks of sea level rise to **public assets** in the local area (eg roads, beaches, parks and gardens)?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

14. Who do you think should make decisions about the risks of sea level rise to **private property** in the local area?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

15. If there is to be a **strategic plan** on sea level rise for the **local** area, who should have responsibility for making that plan?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

16. Implementing adaptation options, whether they be coastal protection or things like relocating assets, is going to cost money; who do you think should be **responsible for bearing the costs** of adaptation options?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

Conclusion

Intro: "Thank you for your time today..."

17. Is there anything you would like to talk about that we haven't covered in the interview?

Demographics sheet

PROPERTY OWNERS

Current State of Roles and Responsibilities for Coastal Management
1. How long have you lived in the local area ? –
2. How long have you owned your house for? –
3. Is this your primary residence ? –
4. Is the coast an important part of your life here? If so, in what ways? –
5. Our study is looking into coastal management, what would you say are the big issues for coastal management in the region? –
6. Do you think you have a role or particular responsibilities that relate to these issues? –
7. Who do you think are the key organisations or levels of government that have roles and responsibilities in coastal management here? –
8. Thinking about coastal management, are there things that are working well ? –
9. Are there things that are not working well ? –
The impact of sea level rise and adaptation planning on responsibilities <i>Intro: "Some researchers and policy makers have suggested that the risk of sea level rise may change the mix of who is responsible for things like decision making, risk management and bearing the costs of adaptation options..."</i>
10. Firstly, how do you imagine sea level rise impacting this area? – <i>Prompt: Timeframes? Level of impact?</i> – – <i>If no impact: Can you explain?</i> – <i>Intro: The rest of the interview is about who should do what to manage the risk of sea level rise. Government is attempting to put policies in place to deal with sea level rise so it's important for us to get your views about that process even if you don't think sea level rise is a threat. If you're happy to, I'll continue with the interview with that in mind?</i> –
11. Thinking about the local area, do you think there are specific things or places at risk from sea level rise? –
12. What do you think will need to be done to adapt to deal with these risks and adapt to sea level rise? –

13. Is the risk of sea level rise or adaptation planning processes currently impacting you as a property owner?

- If no – Why not? Does it have potential to do so in the future?
- If Yes – How? Do you have any examples?

Preferences for the distribution of responsibility

Intro: “Eurobodalla/Westernport region is already starting to plan for adaptation to sea level rise. With that in mind, the last stage of this interview is about your preferences for how responsibility for adaptation to sea level rise should be distributed across different levels of government, private property owners and community organisations.”

14. Who do you think should be **providing information and creating knowledge** on the risks of sea level rise?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

15. Who do you think should make decisions about the risks of sea level rise to **public assets** in the local area (eg roads, beaches, parks and gardens)?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

16. Who do you think should make decisions about the risks of sea level rise to **private property** in the local area?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

17. If there is to be a **strategic plan** on sea level rise for the **local** area, who should have responsibility for making that plan?

- Local government
- State government

- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

Can you explain why? *Prompt: What might this depend on?*

18. Implementing adaptation options, whether they be coastal protection or things like relocating assets, is going to cost money; who do you think should be **responsible for bearing the costs** of adaptation options?

- Local government
- State government
- Federal government
- Private property owners
- Community organisations
- Combination?
- Other?

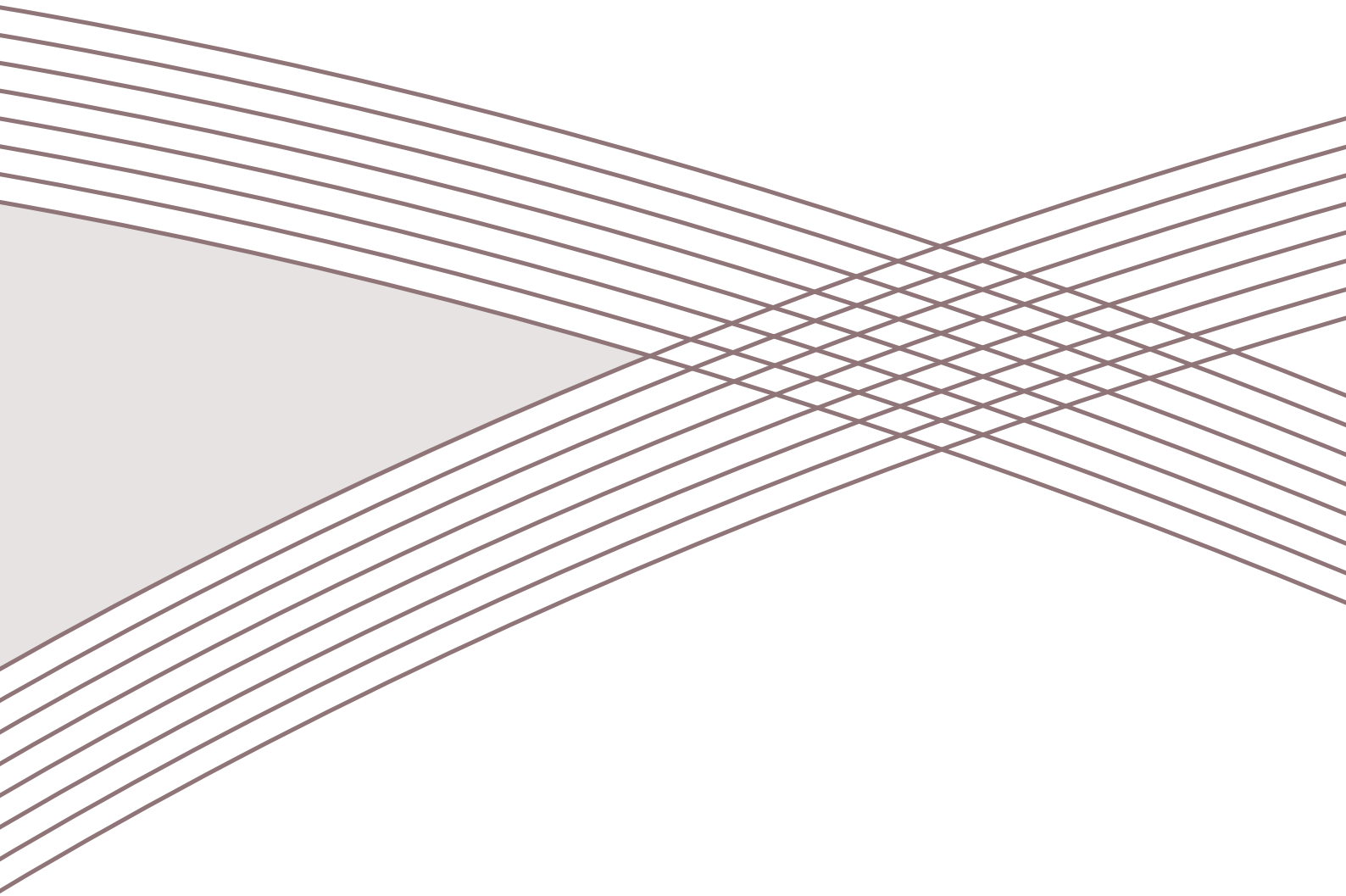
Can you explain why? *Prompt: What might this depend on?*

Conclusion

Intro: "Thank you for your time today..."

19. Is there anything you would like to talk about that we haven't covered in the interview?

Demographics sheet



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