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Sea no Evil, Hear no Evil – Community Engagement on Adaptation to Sea Level Change

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A change in mean sea levels will require new ways to estimate flood risk, and ways to mitigate this risk. This paper looks at the process of developing Adaptation Plans, which are suburb specific studies on the risks and options for potential sea level rise, and the key component of successful adaptation planning, community engagement.

Many coastal decision makers are actively assessing options to manage coastal flood risk that incorporates rising sea levels. These adaptation options are broadly grouped into three categories - protect, accommodate or retreat and each option has its costs and benefits. The mix of options chosen largely depends on the attitudes and perspectives of the community at risk - without their support, decisions within a democratic political system are unlikely to be successful.

This paper reports the findings of a large survey and series of workshops of 'at risk' residents within Lake Macquarie Local Government Area. The survey helped gauge their preferences for management options and decision-making considerations. Following on from this survey is the current work on community engagement as part of developing Adaptation Plans. This engagement is using an innovative collaborative approach to engaging the community on sea level rise and adaptation that focuses on building the capacity of Council and the community to work together to find a solution that sticks.

The usefulness of this research is to increase understanding on the key concerns of community to coastal adaptation, and more effective collaborative engagement on a topic that is often controversial. As a result, this work aims to develop management strategies that are more appealing to those at risk and the wider community.

1. Introduction

An acceleration in rising mean sea levels would mean that coastal flood risk is no longer considered to be 'static' – a rise in sea levels would see areas outside conventional flood hazard mapping becoming affected in the future. Therefore, sea level rise also changes the ways we manage flood risk – options we have used in the past under a somewhat 'stable' climate may no longer be suitable into the future. This paper looks at how Lake Macquarie City Council (LMCC) have incorporated sea level rise benchmarks into their flood risk estimations and how, moving beyond benchmarks, they are now developing Adaptation Plans to identify appropriate risk responses at a suburb level.

A core component of this sea level rise planning has been community engagement. This paper outlines how LMCC have so far engaged their community on sea level rise adaptation and highlights the significant issues on sea level rise adaptation and how these values can be turned into better policy and planning.

2. Background

Lake Macquarie City Council (LMCC) is located south of Newcastle, NSW. LMCC has close to 4000 hectares, and over 10,000 properties located below 3m AHD, adjacent to the 175km of Lake foreshore (WMAwater, 2011). It has relatively few open ocean coastal properties at risk from coastal hazards. LMCC was one of the first Australian Councils to adopt a Sea-level Rise Adaptation and Preparedness Policy in 2008 whereby setting a projected rise in sea-levels of 0.91m by 2011 on 1990 levels (LMCC, 2008).

2.1. Sea level rise risk identification – hazard lines

In 2011, LMCC updated their Floodplain Management Study and Plan to incorporate sea level rise projections. The updated flood levels were used to develop new flood hazard categories and flood planning levels, as shown in Figure 1.

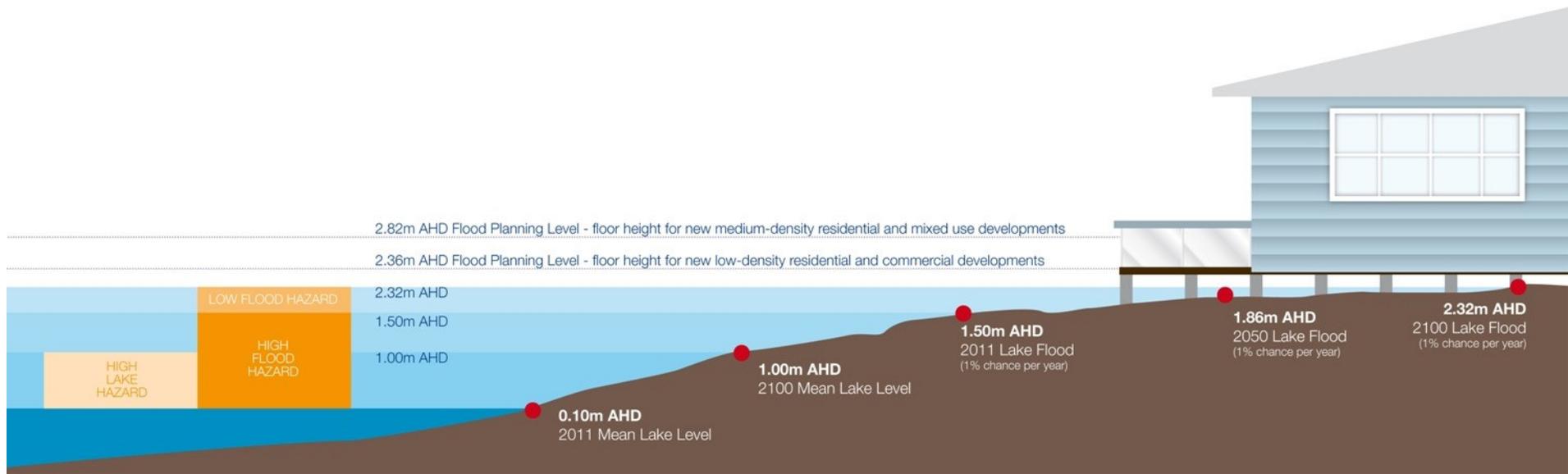


Figure 1: Schematic representation of flood hazard areas and planning floor levels (LMCC, 2011)

Past flood risk estimates, like the 1 in 100 year storm surge, have been mapped as a static line, that is, it is a 'fixed' risk estimate over a period of time. However, with acceleration in mean sea levels, this stationary risk estimate is no longer adequate. Instead, LMCC have used sea level rise benchmarks to create two hazard lines, for the years 2050 and 2100. This allows for a changing level of flood risk as mean sea levels rise, and to accommodate the varying expected asset life of a development. In this case, medium density residential uses the 2100 sea level rise scenarios while low density residential and commercial uses 2050. These hazard lines also differentiate between future mean lake level (permanent inundation) and future extreme weather events using annual reoccurrence intervals (periodic inundation).

These hazard lines were in line with the now repealed NSW Sea level rise Policy Statement and guidelines.

Although a useful tool in first pass risk identification, hazard lines have their problems – for example, they are not easily able to account for uncertainties and local conditions. For example, although sea-level rise is modelled as one of the most certain implications of climate change (Douglas, Kearney et al., 2001), the amount sea-levels may rise, the rate of the rise and the regionally specific consequences of sea-level rise are largely uncertain. Until recently, NSW Councils had been advised by the NSW Government to incorporate sea level rise benchmarks of a rise relative to 1990 mean sea levels of 40cm by 2050 and 90cm by 2100. These figures were considered 'the best national and international projections of sea-level rise along the NSW coast'. (DECC, 2009) However, there is a great deal of uncertainty in the rate of change and where the change will occur. The NSW and Commonwealth benchmarks equates to an increase of around 1cm per year between 2010 and 2100 levels. However, the increase is not likely to be linear, and in fact speed up towards the end of the century (DECCW, 2009), with current rates of change well below the linear increase of 1cm per year.

This uncertainty in rate of change and location was one of the reasons cited for the recent "Stage 1 Coastal Management Reforms" whereby the NSW Government repealed the 2009 NSW Sea Level Rise Policy Statement as Government policy. Instead, local Councils are encouraged to develop regionally specific sea level rise risk estimations.

It is difficult for hazard lines to accurately include local variations in weather conditions like wind or wave energy, or current or proposed land use. The LMCC hazard lines cannot identify the risk of foreshore erosion, which is a significant risk from an increase in mean sea levels. Although LMCC have developed an online tool for estimating the response of estuarine shores to sea-level rise (Stevens, 2010), it is not easily translated into planning policy due to the complexity of shoreline sediment movement and the site specific nature of estimating erosion risk.

2.2. Beyond hazard lines: Adaptation Plans

As well as updating their flood risk estimation to consider sea level rise, LMCC are also focusing on collaborating with the community to identify and treat risks that may be associated with predicted sea level rise. Recognising that the type and scale of risks and their treatment will vary across the city, there is an inability to match a '1 size fits all' solution to the problem. As such, Council are working to develop suburb specific "Adaptation plans." The aim of the Adaptation Plans is to develop and evaluate, in consultation with the community and stakeholders policies that respond to projected flood and sea level rise for a site specific region (generally a suburb

size). The Adaptation Plans intend to provide a framework for decision making in flood and sea level rise affected areas that is based on good science, in the greater community interest, comply with statutory and policy guidelines, and be widely understood, and that is embraced by the community and provides appropriate mechanisms to limit risk.

Adaptation Plans will identify the long-term environmental, social, and economic goals of a local area and determine how these goals might be impacted by projected sea level rise. They will also provide a decision-making framework for managing flood and sea level rise impacts that considers asset value and life span, community values, and triggers for action. They will consider Council's broader planning policies such as Lifestyle 2030 and eventually feed into Development Control Plans and Local Area Plans.

The Plans will incorporate review mechanisms to ensure that they are based on the best available information at any given time. It is anticipated that reviews will occur regularly, or at least when there are significant updates to the predictions and incidence of sea level rise and climate change. These updates and reviews will include going back to the community to seek their involvement.

The Council Adaptation Planning brief states that the objectives of the Adaptation Planning Process are:

- To ensure the community and stakeholders are engaged with identifying sustainable local adaptation options,
- To provide the community with a realistic expectation about future development and conservation patterns in areas affected by sea level rise, while retaining flexibility for land use decision making in the longer term,
- To develop and test a decision making framework that reduces the uncertainty associated with sea level rise and promotes consistent and transparent decision making,
- To develop and test a decision making framework that considers the value and life span of local assets, infrastructure, and activities up to the year 2100 and identifies the key trigger points and thresholds for action,
- To provide direction in how to manage and protect public interests that will be affected by predicted sea level rise in a way that protects the value of these resources, including public land, environmental assets and heritage,
- To ensure that the Adaptation Plans maintain flexibility and include review mechanisms to accommodate changes to science and projected / actual sea level rise and trigger timelines, and
- To evaluate adaptation options to ensure that implementation of the Plans will avoid a net negative impact on future responses to sea level rise or the local community.

The priority locations for Adaptation Plans in Lake Macquarie are Marks Point, Swansea, and Rocky Point however it is likely that other vulnerable localities will be considered in the future such as Belmont, Blacksmiths, and Dora Creek. As there are relatively few examples of local Adaptation Plans within Australia or internationally, the adaptation planning process will require a precautionary collaborative approach, along with innovation and ongoing appraisal. For this reason, the Marks Point Adaptation Plan will be progressed as a pilot project to allow

for review and refinement of the adaptation planning process over time. Progressing a pilot study will also help to identify gaps in Council wide information and policy that may need to be addressed before progressing further with local adaptation planning.

The Adaptation Plan process will draw from a range of sources including the Hunter Regional Environmental Management Strategy 'Decision Support for Adaptation' handbook and workbook, local physical risk studies, demographics, assets identification and GIS mapping.

Figure 2 shows a diagram of the general Adaptation Plan process.



Figure 2: Adaptation Plan context

As shown in the above figure, there are several key components in developing an Adaptation Plan –and a central one is Community Engagement. Community engagement can result in better uptake of decisions and a wider source of ideas and input into the decision making process.

3. Methods of engaging community on sea level rise adaptation

Lake Macquarie City Council regularly undertakes a range of community engagement processes such as their successful 'Sustainable Neighbourhoods' programs. In relation to sea level rise adaptation, there have been two recent engagement processes. The first was the community workshops as part of the exhibition of the Lake Macquarie Flood Study and Management Plan, and secondly the recent Collaborate Governance workshops as part of building organisational readiness to work with the community on the Adaptation Plan. The methods and results are discussed as follows.

3.1. Stakeholder consultation on Flood Study and Plan

In NSW, local Councils have primary responsibility for flood risk management, with technical and financial support from the NSW Government. When Lake Macquarie City Council began to update the assessment of flood risks for the Lake Macquarie waterway, it was a requirement of the NSW Government at that time to include the effects of predicted sea level rise on lake levels and flooding.

It was envisaged that the review study and its recommendations would have direct and significant impacts on some lakeside property owners and residents, as well as on public foreshore activities and access. As such, LMCC engaged consultants Molino Stewart Pty Ltd to help prepare and implement a stakeholder consultation plan associated with the public exhibition of the draft Flood Study and Plan.

The methods used in the consultation plan included:

- Six community workshops with potentially flood-affected residents held in locations around the lake;
- A survey of residents' views relating to the attributes of Lake Macquarie;
- A survey that gauged residents' views on proposed flood risk management options; and,
- A web page on Council's website informing readers of the consultation process, providing links to the draft Flood Study and Plan, and providing opportunities to comment using the surveys and/or written submissions.

3.1.1. Workshops

Approximately 350 people attended the six community workshops. More than 90% of workshop participants were residents who own foreshore properties that are vulnerable to flooding and sea level rise. These owners were direct-mailed information about the draft Flood Study and Plan, and an invitation to attend the workshops. The workshops were also advertised through the local press and Council's website.

The workshop program, facilitated by Molino Stewart, consisted of three main parts:

1. Briefing by Council and the flood consultants on the draft Flood Study and Plan
2. Questions from participants regarding aspects of the draft Flood Study and Plan
3. Facilitated small groups to discuss and identify suitable floodplain risk management options

3.1.2. Surveys

Participants could complete the two short surveys either at the workshop or online at Council's website. There were 690 respondents to each of the surveys. Approximately 84% of survey respondents owned or lived in a property that is likely to be affected by flooding with only six percent lived more than one kilometre from the lake foreshore.

The first survey asked respondents to rank a list of eight attributes of Lake Macquarie that might be considered by Council when making decisions to manage the effect of floods and sea level rise. A summary of results are shown in Figure 3.

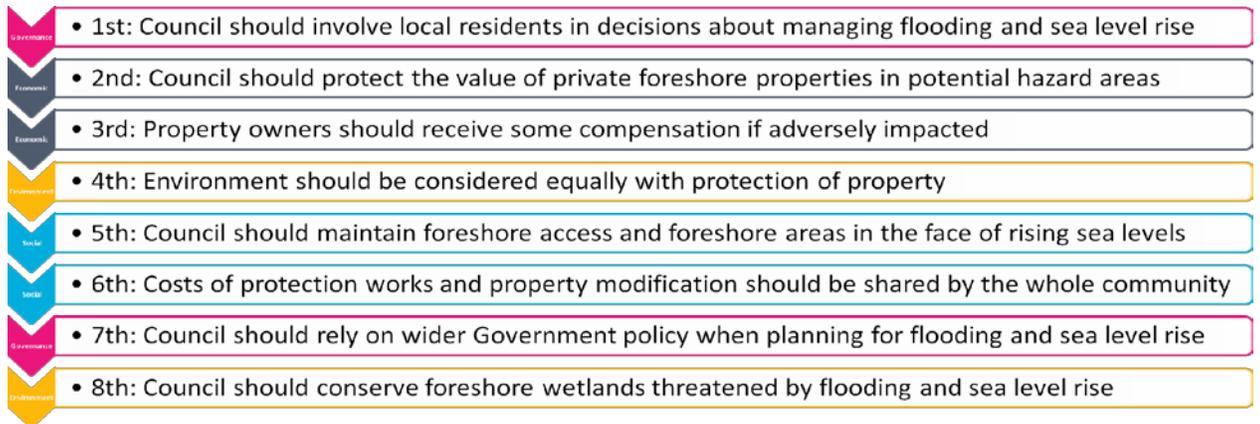


Figure 3: Survey results asking residents to rank a list of factors council should consider when making decisions on changing sea levels.

The overall findings of this survey was that community want to be included in decision making and don't trust national or state policy for local decisions. Economic considerations were the most important to residents, with protection of the value of property and provisions of compensation being highly ranked. Conservation of threatened wetlands was the least popular however, considering the effect of foreshore protection on natural environments was of moderate importance

The second survey involved respondents using a Likert scale to review a list of 16 possible management measures that could be used by Government, Council, businesses, residents and property owners to reduce the risks from lake flooding and permanent inundation.

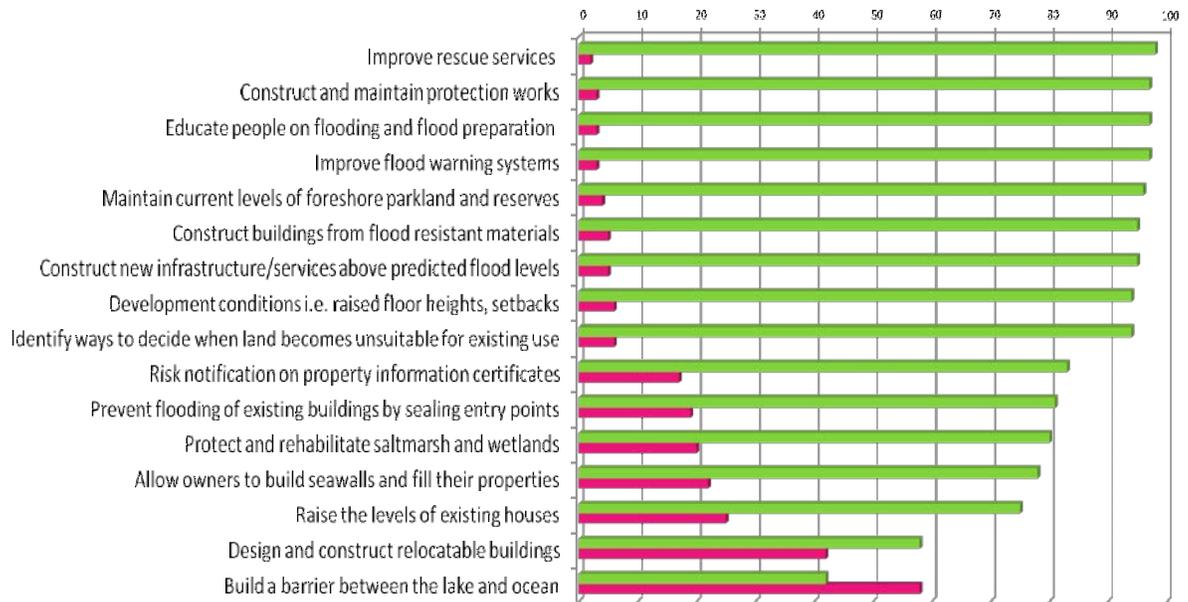


Figure 4: Results from residents on percent agree (green) / disagree (red) on management options for changing sea levels

The findings of this survey question was that the most favourable options include improvement of rescue services, construction and maintenance of protection works, education of people about risks, improvement of flood warning system and

maintenance of foreshore parkland and reserves. Least popular options included design and construction of relocatable buildings and the building of a barrier between the lake and the ocean to reduce the effects of king tides and ocean storm surge into the lake. Also notification of risk to potential buyers and developers.

3.1.3. Non survey responses

As well as the surveys, qualitative data was collected from residents through discussions and online and written submissions to the flood study. A range of issues were raised through this collection, Figure 5 shows the some of the issues raised and example quotes on those issues.



Figure 5: Common themes and responses from non-survey feedback

3.2. Sea level rise Adaptation Planning: A collaborative approach

One of the key findings of the Flood Study community engagement was that residents want the opportunity to have input into decision-making, and tend to have low levels of trust in current governance systems. There was also a preference for 'bottom-up' decision making on management measures -local scale flood modification measures like sea walls and drains were favoured over large-scale works or wider state or national responses.

As such, it was clear that a strong level of community engagement and 'bottom up' decision-making would be essential for a successful Adaptation Planning Process. The long-term success of the adaptation plan requires that it is created 'with' affected and interested stakeholders and not prepared in isolation and then delivered as a fait accompli. Traditional consultation models could not deliver the innovation and commitment required to create an enduring plan. The risk of community and stakeholder opposition to any plan was sufficiently high that a more collaborative approach was required.

3.2.1. The Theory of Collaborative Governance

Council chose an approach based on Twyford's Collaborative Governance roadmap (See Figure 6). The roadmap was selected for its ability to deliver enduring solutions to wicked dilemmas through diversity, innovation, and collaboration.

The five steps of the Collaborative Governance (CG) approach are as follows:

1. Commit to Collaboration
2. Co-define the Dilemma to be resolved
3. Co-design the process
4. Co-create the solution
5. Co-deliver actions.

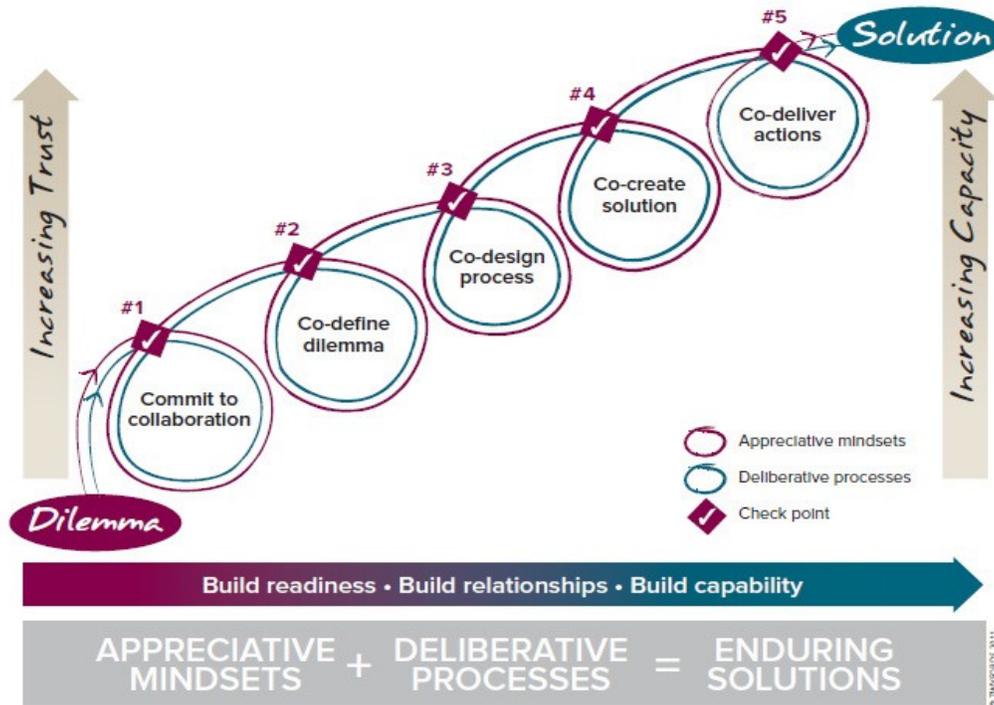


Figure 6: Twyford's five-step Collaborative Governance Model

The rationale Council accepted for this approach was that:

- In order for the adaptation plan to succeed, all stakeholders need to play a part in, or at least understand and accept, its implementation;
- In order to accept their role in implementation, stakeholders need to own the plan and the actions it recommends;
- In order to own the plan stakeholders, need to have a meaningful role in developing it;
- In order to participate in developing the plan stakeholders need to own, that is, help design, the process by which the adaptation plan will be created;
- In order to help design the process, stakeholders need to understand and own the dilemma to be solved;
- In order to share in defining the dilemma, stakeholders need to know that Council is committed to collaborating with them; and,
- In order to do all of the above, Council must first make an informed commitment to working in partnership with the community.

The implications of this model and rationale were that Council committed to working with the affected community throughout the project in a way that was qualitatively different to any previous engagement. It meant stepping back from decisions. It

meant inviting stakeholders into the dilemma at every opportunity. It meant engaging before Council fully understood what it was engaging about.

This approach builds trust and invites stakeholders into a problem-solving mindset. Jointly identifying the dilemma and jointly working on solving it will provide Council and the community with the best opportunity to ensure that the adaptation plan is not just another plan, but represents a lasting solution to the complex challenges of flood risk.

3.2.2. Collaborative Governance in Practice

The first step of the CG roadmap required Council to first understand the meaning and implications of collaboration. Secondly, it meant making the commitment to work differently, to collaborate with the community to create the adaptation plan. Importantly, this commitment has to be made at a senior level and had to be made across the organisation, rather than by only the responsible department.

To achieve these ends we developed and ran a one-day commitment workshop over two consecutive half days with 30 staff from across the organisation. The workshop provided an opportunity for staff to share and learn from their experiences of working with stakeholders. We undertook Twyfords' Collaboration readiness Diagnostic reviewing strengths and opportunities for capacity building. Participants interviewed each other to explore successful examples of engagement. We used Twyfords' analytic tools to assess the level of complexity of the sea level rise dilemma. We used complexity science models to determine how best to work with stakeholders. From this work came an understanding that this project presented a truly complex dilemma for which collaboration would be the key to creating an enduring plan.

During the second half-day workshop, stakeholders were identified and participants discussed their successful experiences of engaging those stakeholders. The Twyfords' Appreciative Stakeholder Analysis tool was applied to identify the most positive contribution each stakeholder is able to make to the adaptation plan. Finally, participants did some planning for step two of the CG roadmap.

The second step is Co-Define the dilemma. This step is about working with the community of interest to build a shared understanding of the problem to be solved and what a successful solution must deliver - the criteria.

To do this in an efficient way Council has chosen to piggy back this process on existing engagement processes. Informal discussions are being held with a range of community members to explore what matters to them with regard to flood risk and managing those risks. Input gathered during the flood study was also used to help build a picture of the dilemma from all perspectives.

The task of co-defining the dilemma will take place during a series of community workshops scheduled for February 2013.

The third step in the roadmap is to co-define the process. In this case, this means working with a cross-section of community members to co-design the engagement plan, thereby creating an engagement plan that works and to which all stakeholders are committed. The conversation about co-defining the dilemma will take place at the same workshop in February.

The fourth and fifth steps in the CG roadmap are co-creating the adaptation plan and co-delivering the actions. The detailed process for these activities will be developed during step three.

3.2.3. Results of workshops

At this early stage in the adaptation-planning project, only the first of the five CG step – Commit to Collaboration - has been completed. The cornerstone of this step was the highly interactive cross-Council workshop, which gave the organisation an opportunity to think about the pros and cons of collaborating. The readiness diagnostic allowed the group to think about its experience of collaboration and how ready it is to embark on the journey. The results indicated that Council's processes for collaborating with stakeholders were seen to be quite strong, but the formal skills and training around how to collaborate is an area for some improvement.

One of the key outcomes of the diagnostic was the group discussion around each of the elements. The conversation about leadership and decision making itself helped the group to build a commitment to collaboration. It also built a common vocabulary across the organisation.

The internal feedback from the workshop indicated that many departments across Council have not incorporated sea level rise policy into their planning, or are experiencing difficulties in making decisions or applying the policy. The general implication seemed to be that consistent sea level rise decision making could not occur without a 'whole of Council approach' to the issue.

In choosing the Collaborative Governance approach Council recognises that when embarking on a process of collaboration with external stakeholders it is essential that a similar level of collaboration be supported within the organisation. Organisations that collaborate well internally are much more able to do the same with their external stakeholders. The commitment workshop was an opportunity to model good internal collaboration and to reflect on the implications of this experience for collaboration on the adaptation plan.

Building the internal commitment to collaborate sets the rest of the project up for success and is an essential component of the collaborative governance approach.

Step two in the CG roadmap is to co-define the dilemma. At the time of writing, this process has begun. Having spent some time in conversation with a wide range of stakeholders, Council and a cross-section of the community will come together in February to explore the issues raised and create a shared definition of the dilemma. This is a very important step because only when we all agree on the nature of the dilemma to be resolved can we work constructively together to find the solution. Without agreement on the dilemma, there is a far higher risk of resistance, pushback, and political pressure being applied.

It is anticipated that at the end of a series of deliberative workshops in February there will be an achieved consensus on the dilemma facing Council and the community.

At the same workshops, step 3 of the Collaborative Governance roadmap will be addressed- Co-design the process. The output will be an engagement framework. The difference is that Council and the community will create this framework through collaboration. Co-design builds commitment. It also creates better processes as well as building trust, breaking down barriers, and giving everyone an experience of

collaboration. In short, it builds readiness for the next difficult conversation about adaptation planning.

4. Discussion

The community consultation on the flood study found that a dominating concern to residents was that they be included in decision making relating to management of flooding and sea level rise. Workshop participants wanted Council to provide more and clearer information to them about flooding, climate change, and sea level rise, and keep them up-to-date with the latest trends and reports.

A secondary concern was that residents want local-scale flood modification measures such as drains, levees and sea walls to be used by Council to manage flood risk, but was not supportive of 'big' projects such as dams and entrance barriers. Response modification measures (e.g. community education and improved warning systems) and property modification measures (e.g. house-raising) were also favoured to manage flood risk and sea level rise impacts. Again, the Adaptation Planning process may help to either identify local solutions, or help the community understand why a more broad solution could be a better option.

Regardless of what options are, chosen, economic considerations were also very important. The first economic consideration was the protection of private property prices and the provision of compensation where the property usability or value is negatively impacted.

Ranking not as highly as current mainstream media may promote, the scepticism on climate change was only a moderate concern. The scepticism seemed to stem either from perceived lack of undeniable proof of climate change or from the fact that no sea level rise change has been observed through the personal experience of respondents.

The Adaptation Planning process and the collaborative engagement process seeks to address these issues. They allow community consultation to be sought and incorporated. They allow local scale adaptation measures to be considered in direct response to the local risk and community values. They also allow for clear and transparent decision making to occur so that decisions that are made are more defensible, and hopefully more palatable.

Moving into the future, LMCC aim to continue to collaborate throughout the adaptation planning process. In February stakeholders will define the dilemma and draft the engagement strategy. This strategy will be put on public exhibition to ensure that the process meets the expectation of those involved. Once adopted, the collaborative process will be piloted in the first Adaptation Plan area of Marks Point. Through this process it will be reviewed and improved before being applied in other at risk areas.

5. Conclusion

Sea level rise changes the way council manages coastal flood risk. It changes both the way risk can be mapped and the management options for minimising this risk. LMCC have actively incorporated sea level rise risk into their flood planning levels and now working towards localised Adaptation Plans to identify best management options. A core part of this process is to collaborate with the community, and ensure that the plan emerges from those most affected – specifically ensuring that decisions are kept localised and that the process is open and transparent. Good collaborative engagement will ensure a more effective uptake of adaptation measures.

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