

Map
1

Effect of Climate
Change on Sea
Level Rise

Plan
2

Assessing
Implications of
Coastal Hazards for
Planning

Comm
3

Communicating Sea
Level Rise

October 2012

Sydney Coastal Councils & CSIRO

Mapping & Responding to Coastal Inundation

3 Supporting
Local Government
to communicate
coastal inundation



ISBN: ONLINE 978-0-643-10943-8: PRINT 978-0-643-10944-5

Climate Adaptation Flagship, Ecosciences Precinct, Dutton Park, Brisbane, Queensland.

Citation

Leitch, A. M., and Inman, M. (2012) *Supporting Local Government to communicate coastal inundation*. Resource kit prepared for the Sydney Coastal Councils Group Inc. CSIRO Climate Adaptation Flagship, Brisbane, Australia.

Copyright and disclaimer

© 2012 CSIRO To the extent permitted by law, all rights are reserved and no part of this publication covered by copyright may be reproduced or copied in any form or by any means except with the written permission of CSIRO.

Important disclaimer

CSIRO advises that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, CSIRO (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.

Acknowledgments

This work was funded by the Sydney Coastal Councils Group through a grant from Emergency Management NSW Disaster Mitigation Grants and CSIRO's Climate Adaptation Flagship. Thank you to the staff from the member Councils of the SCCG, particular Pittwater Shire Council and Sutherland Shire Council, who generously contributed their time and experience to this project. Thank you also to Geoff Withycombe and the Technical Committee of the Sydney Coastal Councils Group for their input and review of drafts.

Contents

How to use this report.....	4
Part I The SCCG project: <i>Mapping & modelling coastal inundation</i>	5
1 Project overview	5
1.1 Phase Three: Supporting Local Government to communicate coastal inundation.....	5
1.2 Project description Phase One and Phase Two: Mapping & Responding to Coastal Inundation.....	5
1.3 Project products.....	6
Part II Explaining sea level rise	8
2 Understanding sea level rise: a brief outline	8
2.1 Projected sea levels for NSW	8
2.2 The height of the sea	9
2.3 Useful coastal terms	11
3 What type of issue is sea level rise?.....	12
3.1 A wicked or post normal science problem.....	12
3.2 Sea level rise – is it just another natural hazard?	13
3.3 Approaches for sea level rise reforms	13
4 Government responses to sea level rise	14
Part III Communicating sea level rise	16
5 Councils, communities and communication	16
6 Community perceptions of climate change and sea level rise	17
6.1 Community perceptions of climate change.....	17
6.2 Brownlash and ‘denial’ of climate change.....	19
6.3 Community perceptions of sea level rise and impacts concerning property	19
7 Councils’ perceptions of climate change and adaptation	22
7.1 Review of LAPP projects	23
8 Summary	24
Part IV: Frameworks for risk communication & community engagement	25
9 Risk communication	25
9.1 Communicating ‘Living with risk’	25
9.2 Background to risk communication	25
9.3 A framework for risk communication	26
10 Community engagement over coastal values	29
10.1 International Association for Public Participation (IAP2)	29
10.2 Tools for communication and engagement.....	32
10.3 Other community engagement resources.....	35

Part V Case studies		37
11	Case studies from Australia.....	38
	11.1 NSW: Lake Macquarie City Council.....	39
	11.2 Victoria: sea level rise plans of Wellington Shire Council.....	40
	11.3 NSW: Gosford City Council planning for sea level rise.....	41
	11.4 Tasmania: Climate change impacts on Clarence coastal areas.....	43
12	Case studies from other countries.....	44
	12.1 Canada: Managing landslip risk in North Vancouver.....	45
	12.2 United Kingdom: Facing up to rising sea levels.....	46
	12.3 USA: Virginia Beach listening sessions.....	48
	12.4 Europe: Coastal Communities 2150.....	49
	12.5 New Zealand: a manual for managing coastal hazards.....	50
Part VI Resources for communication		51
13	Resources for communicating climate change and sea level rise.....	51
Part VII Stakeholder analysis		54
14	Stakeholder ‘plan on a page’.....	54
Part VIII Bringing it together		63
15	Developing a communication & engagement strategy.....	63
	15.1 Identify Council’s communication goals and objectives in engagement with the community.....	64
	15.2 Consider the communication environment.....	64
	15.3 Identify and analyse the stakeholders.....	64
	15.4 Creating a dialogue.....	65
	15.5 Messages.....	65
	15.6 Monitoring and evaluation.....	66
	15.7 Implementation.....	66
	15.8 Summary.....	68
References		69

Figures

Figure 1: Contributions to coastal inundation.....	9
Figure 2: Extreme events will exacerbate sea level rise by adding extra height to existing waves	9
Figure 3: Elements of a communication and engagement strategy	63

Tables

Table 1: Climate change sea level rise allowances in Australian jurisdictions.	15
Table 2: Community perceptions of coastal values.....	18
Table 3: Summary of risk communication framework	28
Table 4: IAP2 spectrum for community engagement.....	30
Table 5: Case study of the use of IAP2 by a Council: Wellington Shire Council Victoria	31
Table 6: Communication and engagement tools	32
Table 7: Community engagement resources.....	35
Table 8 Summary of Australian case studies	38
Table 9: Summary of international case studies	44
Table 10: Media resources for explaining sea level rise.....	51
Table 11: Communication resources for climate change and sea level rise from technical sources.....	52
Table 12: Sample implementation or action plan	67

How to use this report

This is the third and final phase of a project that has mapped areas of risk in the Sydney coastal region using sophisticated modelling of coastal inundation. The first two phases of the project aimed to assist in determining risk and consistent model planning and management responses in consultation with relevant state government agencies and the broader community. All three phases have involved CSIRO: the second phase (planning) also involved the NSW Environmental Defenders Office.

This third phase takes the form of a resource kit that can assist Councils in planning communication for their communities about climate change impacts in relation to sea level rise. Across the Sydney Coastal Councils there are different levels of climate change vulnerability and different Councils are at different stages in considering and responding to sea level rise. This means that different Councils have different contexts and needs for their communication efforts. This resource kit brings together information from a variety of sources so Councils can select information that suits their level of exposure to sea level rise as well as their tools and processes used to communicate with their local community.

This resource kit is presented in seven parts.

Part I: Mapping and modelling coastal inundation

Summarises in simple terms the SCCG project undertaken by CSIRO to model and map coastal inundation under future sea level rise

Part II: Explaining sea level rise

Describes sea level rise and relevant coastal concepts. Also briefly outlines nSW government response to sea level rise

Part III: Communicating sea level rise

Outlines the context for coastal Councils communicating sea level rise and useful information about coastal inundation concepts and resources including some text that can be useful in Council publications

Part IV: Frameworks: risk communication and community engagement

Summarises thinking about communication and engagement of the community around complex issues which requires transparency of governance to build trust and credibility in risk management bodies

Part V: Case studies

Showcases Australian and international examples of local or regional authorities' efforts in natural hazard communication

Part VI: Resources for communication

Lists some resources and examples useful for communicating climate change and impacts such as sea level rise

Part VII: Stakeholder analysis

Provides a series of sample 'plan on a page' for a potential stakeholders

Part VIII: Bringing it all together in a communication and engagement plan

Part I **The SCCG project: *Mapping & modelling coastal inundation***

1 Project overview

1.1 Phase Three: Supporting Local Government to communicate coastal inundation

The resource kit is the third and final phase of a project by the Sydney Coastal Councils Group *Mapping and Responding to Coastal Inundation*.

The resource kit is designed to assist Councils to develop communication plans and material for their own community on this project and related coastal inundation projects. It brings together scientific and practical information from a variety of sources so each Council can select information that suits their level of exposure to coastal inundation as well as their existing tools and processes of communicating with their community.

The resource kit builds on the two earlier phases of the project which aimed to determine risk and build consistent modelling, planning and management responses in consultation with relevant state government agencies and the broader community. These earlier phases involved CSIRO and the NSW Environmental Defenders Office and are described briefly below.

1.2 Project description Phase One and Phase Two: Mapping & Responding to Coastal Inundation

1.2.1 THE SYDNEY COAST

The Sydney Coastal Councils Group region spans about 100km of coastline extending from the Royal National Park in the south to the Hawkesbury River in the north and includes a complex coastal region consisting of open beaches, lagoons and estuarine environments. Over this diverse coastal region, a range of factors contribute to extreme coastal sea levels and inundation events. Storm surges from severe weather events combine with tides to elevate sea levels across the region. On coastal beaches, sea levels are affected by wave breaking processes and so during an extreme event the maximum sea level will vary considerably along the coastline. The amount of this variation will depend on the profile of the coastal sea floor, exposure to prevailing winds and waves. This project aimed to provide better information on the size of this variation in the Sydney coastal region as well as inform some potential local government responses.

1.2.2 MAPPING AND MODELLING

In early 2012 the SCCG finalised the project *Mapping and Responding to Coastal Inundation*. This project evaluated coastal inundation from extreme weather events along Sydney's coastal and estuarine region under current and future sea level rise conditions based on the current *NSW Government Coastline*

Management Manual (1990) which is 0.4 metres by 2050 and 0.9 metres by 2100. This study considers future extreme sea level from tides and storm surge: however a novel aspect of this study is that it also considers how waves contribute to elevated sea levels during future storm events.

The challenge in the first phase of this project was to assemble the necessary modelling tools, techniques and data to develop a consistent approach for estimating the extreme sea levels that contribute to inundation across the entire Sydney Coastal Councils region. It was also necessary to develop a scientific method for calculating and mapping inundation at a scale that is appropriate and relevant for Local Government as the users of this information. Finally, an important consideration was to develop a data framework linking Lidar and bathymetric data that could be utilised for other projects as required.

During this study the research team assessed a number of different approaches to mapping coastal inundation as well as the needs of various Council stakeholders. The study used 'design storm approach' which used data from an actual storm in the region – the 'design storm' event – to determine how real storm conditions interact with tides, storm surge and wave setup to affect coastal sea levels. This model was used to test how coastal sea levels behave under a different set of storm conditions. For example, we tested how the water level changes under storms occurring at different tides, with different surges; and also with different combinations such as a high surge with a moderate tide; or a high tide with a moderate surge etc.

1.3 Project products

This project involved direct liaison with local Councils of the SCCG, establishment and liaison of a national expert panel and identification of issues and needs for potential future work. The final products available from this project include:

Phase 1: Effect of Climate Change on Sea level Rise and Extreme Sea Levels.

A set of high resolution hydrodynamic model simulations produced in order to obtain current climate, as well as storm tide return level estimates and sea level rise considerations.

Technical reports:

- McInnes K., Lipkin F., O'Grady J. and Inman M. (2012) *Modelling and Mapping of Coastal Inundation Under Future Sea Level Rise*. Technical report prepared by CSIRO Climate Adaptation Flagship for the Sydney Coastal Councils Group, Inc.

Maps and data:

- Inundation maps: Maps for each of the Sydney Coastal Councils covering six scenarios that were analysed (1 in 1 year & 1 in 100 year over three sea level rise scenarios)
- GIS layers for the Sydney Coastal Councils region covering the six scenarios that were analysed
- An integrated data set for Lidar and bathymetry for the Sydney Coastal Councils Group

Phase 2: Model planning provisions

Development of model planning provisions to integrate sea level rise and extreme sea level events into relevant planning strategies of the SCCG:

- EDO (2010) *Audit of Sea Level Rise, Coastal Erosion and Inundation Legislation and Policy*. Report by the Environmental Defender's Office, New South Wales for the Sydney Coastal Councils Group, NSW

- Inman, M., Taylor, B. and Harmon, B. (2011) *Incorporating Coastal Inundation & Sea Level Rise into Local and Regional Planning Responses*. Technical report prepared by CSIRO Climate Adaptation Flagship for the Sydney Coastal Councils Group, Inc.

Phase 3: Communication resources

Development of communication resource materials to support Councils to communicate with their communities.

- Leitch, A. M. (2012) *Councils communicating sea level rise: a literature review*. Report prepared by the CSIRO Climate Adaptation Flagship for the Sydney Coastal Councils Group Inc
- Leitch, A. M. and Inman, M. (2012) *Supporting Local Government to communicate coastal inundation: A resource kit*. Report prepared by the CSIRO Climate Adaptation Flagship for the Sydney Coastal Councils Group Inc (this document).

Part II Explaining sea level rise

2 Understanding sea level rise: a brief outline

Sea level rise is described by CSIRO¹ as:

...a response to increasing concentrations of greenhouse gases in the atmosphere and the consequent changes in the global climate. Sea-level rise contributes to coastal erosion and inundation of low-lying coastal regions, particularly during extreme sea level events. It also leads to saltwater intrusion into aquifers, deltas and estuaries. These changes impact on coastal ecosystems, water resources, and human settlements and activities. Regions at most risk include heavily populated deltaic regions, small islands (especially coral atolls), and sandy coasts backed by major coastal developments.

As a largely coastal dwelling nation, most Australians are familiar with the coast and its daily and seasonal processes. This means that the dynamics of the shoreline are well known: high tides, storms, east coast lows, coastal erosion and accretion, flooding and inundation are all events observed by coastal residents. However a changing climate will affect some coastal phenomena causing the rate and pattern of events to change as global temperatures warm, sea levels rise, and extreme events become more intense and or frequent. Sea level rise, along with population and development pressures on our coasts, means that the Australian coastline is likely to look very different in the future.

2.1 Projected sea levels for NSW

Coastal observations show that sea level rise has been occurring around Australia during the last century. Extreme sea level events occurred three times as often in the second half of the 1900s compared with the first half².

The most recent report of the international authority on climate change projections (IPCC 2007³) indicates that sea levels will rise (relative to 1990) by 9-27 cm by 2050 and by 18 to 81 cm by 2100⁴. CSIRO studies (McInnes *et al.* 2007) have shown that sea level rise off the east coast of Australia could be up to 0.1 m higher than the global average by the end of the Century, due to strengthening of the East Australian Current.

In the *CSIRO-BoM State of the Climate* released in March 2012⁵ it was reported that the global-average mean sea level for 2011 was 210 mm (\pm 30 mm) above the level in 1880, the earliest year for which robust estimates of global-average mean sea level are available. The observed global-average mean sea-level rise (since 1990) is near the high end of projections from the most recent assessment by the Intergovernmental Panel on Climate Change (IPCC 2007).

Coastal sea levels vary on different timescales due to a range of physical factors including: daily, fortnightly and annual tidal fluctuation, seasonal contributors (such as El Nino Southern Oscillation), severe weather

¹ www.cmar.csiro.au/sealevel/index.html

² Church, JA, Hunter, JR, McInnes, KL and White, N. (2006) Sea level rise around the Australian coastline and the changing frequency of extreme events. *Australian Meteorological Magazine* 55: 253-260.

³ IPCC (2007): Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) 2007 *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, London.

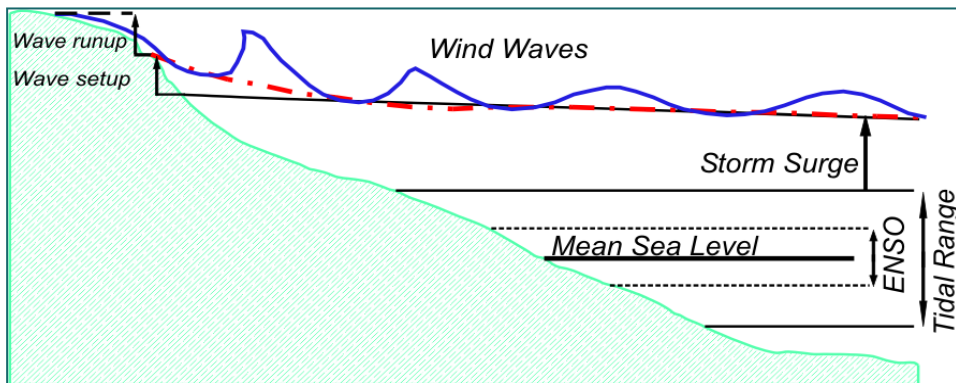
⁴ Check here for an explanation or more detail about these numbers: www.cmar.csiro.au/sealevel/sl_proj_21st.html#21C_ts

⁵ CSIRO-BoM (2012) *State of the Climate*. <http://www.csiro.au/Outcomes/Climate/Understanding/State-of-the-Climite-2012>.

events resulting in storm surges, and wind driven waves that contribute to wave development (wave set up).

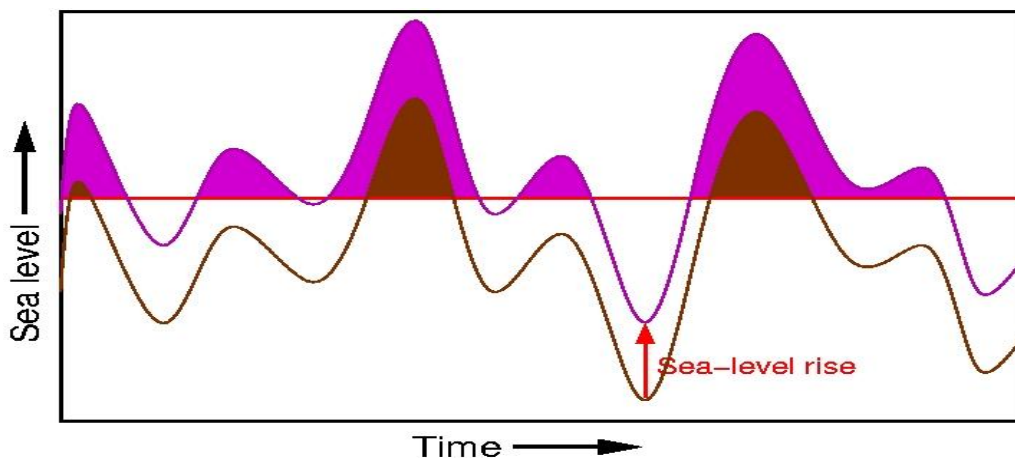
Superimposed on these variations are long term increases in sea level due to global warming. These various contributions are illustrated in Figure 1. Sea level rise due to climate change will increase the impact of extreme sea levels along low-lying coastal regions, potentially causing more frequent inundation events shown in Figure 2. These could be experienced as temporary inundation like nuisance flooding; more frequent inundation or flooding that means areas become unusable; or permanent inundation.

Figure 1: Contributions to coastal inundation



Extreme sea levels comprise some combination of storm surge and astronomical tide, often referred to as a storm tide. Note that a storm tide can comprise a large surge in combination with a small or even negative tide or a moderate surge in combination with a particularly high tide. Sea levels may be further amplified at the coast due to wave breaking processes such as wave setup and run-up. Source: McInnes et al (2009)

Figure 2: Extreme events will exacerbate sea level rise by adding extra height to existing waves



2.2 The height of the sea

The height of the sea is determined by a complex array of linked factors that vary across:

- time scales from hours to decades and centuries
- geographic scales with many different types of coastlines including sandy beaches, rock shores, and mangrove/wetlands.

Climate change affects the height of the sea in two main ways: firstly through expansion of the ocean and secondly through changes to processes that influence wave action on the coast. These processes are described below with more detail on these concepts in the other documents from this project⁶.

2.2.1 EXPANDING OCEANS

Water expands when it heats up. Increasing global temperatures leads to thermal expansion of the oceans. Also entering the ocean to increase its level is more water from melting glaciers, ice sheets of Greenland and Antarctica as well as contributions from lakes, dams, rivers and groundwater.

2.2.2 CHANGING WAVES

One of the biggest factors in determining sea height is the role played by tides, winds and waves. The next biggest influence is local extreme events through severe weather systems which, in the Sydney region, are east coast low pressure systems or areas of low pressure⁷ and strong winds. This combination of the low pressure and strong winds further elevate sea levels through winds or currents (wave set up or current set up). These can also produce a storm surge on open coasts.

Waves also affect sea levels on the open coast. Two aspects of wave breaking are important for sea levels. Firstly, wave set up is the cumulative effect of wave breaking in the surf zone and is a function of the wave height. On the NSW coast the contribution to coastal sea levels due to storms from wave setup has been estimated to be 0.7-1.5 m⁸. Secondly, wave runup⁹ is the additional height due to the breaking of individual waves on the beach. Although wave runup is short-lived, and therefore doesn't contribute to the 'still water levels', it has been estimated to reach an elevation of 4.0-8.0m higher than the still water level attained by the combination of astronomical tides, storm surge and wave setup⁸.

Wave breaking processes are mainly of concern on the open coastline. Estuaries and harbours are generally sheltered from the additional sea level contributions due to wave setup or runup: although local wave breaking within a harbour may have some effect for winds from particular directions. Similarly storm surges are much reduced in enclosed or semi-enclosed water bodies such as coastal lakes or harbours.

Waves may be 'locally' generated by short period storm waves from strong wind conditions; or generate far away by distant storm systems and propagate through the deep ocean with little loss of wave energy. Similarly local weather events are the main cause of elevated coastal waters through the generation of storm surges. However more remote events moving along the southern coastline can also generate elevated sea levels.

Variations in mean sea level also occur on seasonal and interannual time scales: in NSW the most significant is the El Nino Southern Oscillation (ENSO) phenomenon with higher sea levels during La Niña and lower sea levels during El Niño. The water level change along the NSW coastline due to ENSO has been estimated to be around ±0.1m.

On the NSW coast, eddies from the East Australian Current can also lead to changes in coastal sea levels.

⁶ Available from: www.sydneycostalouncils.com.au/Project/Mapping_and_Responding_to_Coastal_Inundation

⁷ As a rough guide, sea levels rise approximately 1cm for every hPA drop in pressure.

⁸ NSW Government (1990) Coastline Management Manual ISBN 0730575063 available at www.environment.gov.au/archive/coasts/publications/nswmanual/index.html

⁹ Note that this project has not considered wave set up.

2.3 Useful coastal terms

Coastal change

- **Coastal accretion** is a long-term trend of shoreline advance through gaining sand/beach sediment.
- **Coastal erosion** is the loss of beach sand or sediment volume and can be a single event of long term over several decades.
- **Coastal recession** is a long-term trend of shoreline retreat and/or loss of beach sediment volume over several decades through wave action, tidal currents, wave currents, or drainage.
- **Coastal flooding or inundation** is an acute natural event arising from extreme weather events (storms), in which normally dry, but low-lying coastal land is flooded. Storm-related coastal inundation is caused by high tides (normally during spring or perigean tides), combining with storm surge and waves.
- **1-in-100 year flood or %AEP (Annual Exceedance Probability)** The storm tide level that is expected to be exceeded on average only once every 100 years: i.e. has a 1% chance of happening. It is important to note that this is a statistical average, and flood events may occur more frequently within the specified period.
- Note that the term '1-in-100 year flood', although commonly used is actually a **not** useful coastal term¹⁰. The term '1-in-100 year flood' was developed as flooding code in the 1960s and has been used since then by planning professionals. However its effectiveness in communicating risk is criticised because it may confuse, rather than explain, issues of irregularity and uncertainty associated with both the timing and consequences of flooding. Also it is also a measure of flood frequency and yet research shows that residents are mostly more concerned about flood levels than frequency¹⁰.

Current set up occurs if the deflected current from the wind set up encounters a coastal boundary and causes elevated coastal levels.

East coast lows are intense low-pressure systems which occur on average several times each year off the east coast of Australia; in southern Queensland, NSW and eastern Victoria.

Sea levels

- **Bath tub modelling** is done using a single value of water level rise in all locations. This method does not take into account storm tide, waves, or wind.
- **Mean sea level** is the height of the sea surface averaged over a period of time such that changes in sea levels due to waves and tides are averaged out. It is measured both through tide gauges and satellite data.
- **Sea level rise** is a response to increasing concentrations of greenhouse gases in the atmosphere and the consequent changes in the global climate. Sea-level rise contributes to coastal erosion and inundation of low-lying coastal regions, particularly during extreme sea level events. It also leads to saltwater intrusion into aquifers, deltas and estuaries. These changes impact on coastal ecosystems, water resources, and human settlements and activities. Regions at most risk include heavily populated deltaic regions, small islands (especially coral atolls), and sandy coasts backed by major coastal developments as well as cliffs and bluffs.
- **Sea level rise investigation area** can be used by governments as an interim guide to indicate areas likely to be subject to coastal erosion or flooding either now or in the future as a consequence of sea level rise. They inform strategic planning practices including the identification of priority areas for detailed studies for either existing or proposed development.

¹⁰ Bell and Tobin (2007). Efficient and effective? The 100-year flood in the communication and perception of flood risk. *Environmental Hazards* 7:302-311

Storms

- **Storm surge** is a temporary and localised increase in sea level caused by falling pressure and strong winds that occur during extreme storm conditions. These elevated sea levels, once generated, can propagate along the coast to affect distant locations.
- **Storm tide** is the total elevated sea height at the coast above a datum (reference point) during a storm combining storm surge and the predicted tide height. To get the final storm inundation level at a locality wave set-up and wave run-up (not considered in this project) need to be added to the storm tide level.

Waves

- **Overtopping by waves** at any coastal locality is usually quite site-specific and depends on the beach slope, roughness of the beach (sand, gravel or large rocks), wave height, exposure to ocean swell, how close inshore waves penetrate before breaking, and the characteristics of the land above the beach e.g. dunes, seawall, low cliffs.
- **Wave runup** is the additional vertical distance that the water reaches due to the breaking of individual waves at the coast. Although wave runup is transitory and therefore not a contributor to the 'still water levels', it has been estimated to reach an elevation of 4.0-8.0 m during an event which is higher than the still water level attained by the combination of astronomical tides, storm surge and wave setup.
- **Wave set up** is the increase in water level within the surf zone above mean still water level caused by the breaking action of waves. Typically, wave setup at the coast is proportional to the wave height: on the NSW coast the wave set up has been estimated to be 0.7-1.5 m.
- **Contribution of waves to coastal sea levels.** Wave set up and wave runup both contribute to coastal sea levels. Wave breaking processes are mainly of concern on the open coastline. Estuaries and harbours are generally sheltered from waves so don't have these extra contributions to inundation levels.
- **Wind setup, or wind waves** are the increase in mean sea level caused by the "piling up" of water on the coastline by the wind. The magnitude of wind setup is related to the depth and width of the continental shelf: wide and shallow continental shelves tend to result in higher sea levels. If there is not a coastal boundary, for instance if the wind blows obliquely toward the coast or along shore, the wind stress induces a longshore current which, if sustained for several days, can become deflected to the left in the Southern Hemisphere due to the Coriolis force resulting from the Earth's rotation.

3 What type of issue is sea level rise?

3.1 A wicked or post normal science problem

Sea level rise is an example of a 'wicked problem'. A wicked problem is a complex issue that is not easily defined and has no clear solution. Such problems are entrenched in the society that generates them and any potential solutions require a change in that society. Similarly sea level rise can be thought of as a post normal science problem which is defined as an issue in which facts are uncertain, information is incomplete, values are in dispute, stakes high and decisions urgent.

Resolving wicked or post normal problems is difficult as any potential resolution generates further issues and potentially brings stakeholders into conflict.

3.2 Sea level rise – is it just another natural hazard?

Local government already manages a range of natural hazards such as landslips, flooding, bushfires, extreme weather events, coastal erosion and earthquakes. State legislation requires local Councils to manage current and future risk of natural hazards through a range of policies and action including land use planning, disaster management planning and response, and management of Council assets and resources.

Essentially Councils take a similar approach to managing all natural hazards by identifying the risk and planning a series of risk reduction, avoidance or adaptation strategies. Emergency management involves preparations and arrangements designed to reduce, prepare, respond and recover from a range of disasters. The State Emergency Management Act (1989)¹¹ outlines Council responsibilities which include Council developing its own local disaster management, plans and committees.

Many of the impacts of climate change in coastal regions – such as flooding or inundation, erosion, storms – are already familiar phenomena to coastal residents. However, in the future the rate and pattern of some of these phenomena will change as global temperatures warm, sea levels rise, and extreme events become more intense and/or frequent. Therefore in the short term sea level rise will likely be experienced as a series of coastal erosion or inundation events that can be managed as a natural hazard. However the widespread implications of sea level rise will require a broader risk management approach that is more collaborative, more inclusive, and ultimately more adaptive.

3.3 Approaches for sea level rise reforms

How an issue is ‘framed’ or discussed is an important factor in influencing how individuals, and therefore the community, understand an issue and make sense of it in their daily lives. The issue of climate change is currently framed as a highly political issue which means it tends to polarize people and contributes to conflict and inaction.

Alternative approaches that some Councils might consider to be more constructive for their community are communicating these sea level rise actions as a ‘no regrets’ or ‘low regrets’ options or ‘real options’ for coastal management.

3.3.1 ‘NO REGRETS’ APPROACH

A ‘no regrets’ option is one that is worth doing because it makes economic or social or ecological sense with or without climate change; while a low regrets options is one that could cope with a wide range of possible climate conditions. For example, some governments frame sea level rise options within current flooding or coastal management policies and management responses rather than specifically branding them as sea level rise policies (e.g. Tasmania¹², New Zealand¹³)

3.3.2 ‘REAL OPTIONS’ APPROACH

The ‘real options’ approach acknowledges that current information for decision making is uncertain but likely to increase in the future. This approach emphasises taking action where there is great certainty that benefits will exceed the costs of action. Where there is less certainty policy makers should try to identify

¹¹ State Emergency and Rescue Management Act (1989): www.austlii.edu.au/au/legis/nsw/consol_act/searma1989331/

¹² Tasmanian Coastal Works Manual. epa.tas.gov.au/coastal/climate-change

¹³ New Zealand Ministry for Environment www.mfe.govt.nz/publications/climate/coastal hazards-climate-change-guidance-manual

options to address current concerns while retaining flexibility to take further actions in the future. Low-cost, reversible actions should also be considered.

4 Government responses to sea level rise

The NSW Government response to sea level rise is – at the time of going to print in September 2012 – in a state of flux. It was announced on 8 September 2012 that the NSW Government would introduce a series of coastal reforms. There is little detail currently on what this means but it does remove the compulsory application of sea level rise benchmarks.

Previously the NSW government had recommended that assessments of the potential impacts of projected sea level rise in coastal areas should consider 0.4 metres by 2050 and 0.9 metres by 2100 relative to a 1990 reference period¹⁴. In 2009 the NSW government developed a sea level rise policy statement¹⁵ to support adaptation as an addendum to its Coastal Protection Act. This policy includes supporting technical resources:

Sea Level Rise Policy Statement

www.environment.nsw.gov.au/resources/climatechange/09708sealevrisepolicy.pdf

Derivation of the NSW Government's sea level rise planning benchmarks: Technical Note

www.environment.nsw.gov.au/resources/climatechange/09709technotesealevelrise.pdf

Guidelines on incorporating sea level rise benchmarks into flood risk assessment

www.environment.nsw.gov.au/resources/water/coasts/10759FloodRiskManGde.pdf

Guidelines on incorporating sea level rise benchmarks into coastal hazard assessment.

www.environment.nsw.gov.au/resources/water/coasts/10760CoastRiskManGde.pdf

Other Australian jurisdictions have also developed benchmarks for sea level rise (see Table 1 and EDO 2011¹⁶). As a result of the NSW Government Sea Level Rise Policy, and also the Australian government's first pass assessment of *Climate Change Risks to Australia's Coasts* in 2009¹⁷, local Councils in the Sydney coastal region have begun to consider sea level rise in addition to existing flooding and inundation risks covered by the NSW Government Flood Policy. The technical explanation of how the government has derived their coastal policy is also available¹⁸.

¹⁴ NSW Government (2010) Guideline for Preparing Coastal Zone Management Plans
www.environment.nsw.gov.au/resources/coasts/101019GdlnsCZMPs.pdf

¹⁵ Available at www.environment.nsw.gov.au/climatechange/sealevel

¹⁶ EDO (2011) Audit of Sea Level Rise, Coastal Erosion and Inundation Legislation and Policy. Report by the Environmental Defender's Office, New South Wales for the Sydney Coastal Councils Group, NSW. Available from www.sydneycostalcouncils.com.au/Project/Mapping_and_Responding_to_Coastal_Inundation

¹⁷ Department of Climate Change. 2009. National Coastal Risk Assessment. Available at: www.climatechange.gov.au/government/initiatives/australias-coasts-and-climate-change/adapting/national-coastal-risk-assessment.aspx

¹⁸ NSW Government (2009) Derivation of the NSW Government sea level rise planning benchmarks: Technical Note. Available at www.environment.nsw.gov.au/resources/climatechange/09709technotesealevelrise.pdf

Table 1: Climate change sea level rise allowances in Australian jurisdictions.

Jurisdiction	2050	2100	Comment
Commonwealth	-	1.1m	No official policy. Adopted a value of 1.1 metres to 2100 for national coastal vulnerability assessment. They caution this may not be conservative and higher values could be used for risk assessment.
Queensland	0.3m	0.8m	Draft Queensland Policy allows 0.8m to 2100. Previous allowance was 0.3m to 2050.
NSW	-	-	Previous benchmarks of 0.4m by 2050 and 0.9m by 2100 removed Sept 2012 ¹⁹ . Now no statewide benchmarks instead councils have flexibility to determine
Victoria	0.2m by 2040		Provisions were changed in June 2012 to be 0.2m by 2040. Previous provisions were 0.8m by 2100 –this rule still applies for greenfield developments outside existing town boundaries.
Tasmania	-	-	Draft State Coastal Planning Policy was rejected in May 2011 due to a number of deficiencies
South Australia	0.3m	1.0m	
Western Australia	-	0.9m	Advises a 0.9m allowance to 2110 (for 100 years) or slightly less to 2100. (This has been reiterated in draft State Coastal Planning Policy in February 2012.)
Northern Territory	0.3m	0.8m	No policy but recommends 0.3m to 2050 and 0.8m to 2100 consistent with Qld

Source: Lord and Gordon 2011²⁰: checked for updates to planning provisions by authors August 2012

¹⁹ Special Minister for State: Media statement 8/9/2012:
www.planning.nsw.gov.au/DesktopModules/MediaCentre/getdocument.aspx?mid=1058

²⁰ Lord and Gordon (2011). Lord, D. and A. Gordon. 2011. Local government adapting to climate change - where the rubber hits the road. Coasts and Ports 2011 Conference, Perth.

Part III Communicating sea level rise

5 Councils, communities and communication

A changing climate means that coastal communities are facing unparalleled change from a range of impacts including increasing temperatures, changes in frequency and intensity of extreme events, and rising sea levels. Australian coastal settlements – whether they are highly urbanised or small rural towns – face a great challenge in planning to be resilient to these projected climate change impacts. In this section we outline the current research on perceptions of climate change and sea level rise of Council organisations and communities as a precursor to planning communication and engagement about coastal inundation and sea level rise.

Impacts of sea level rise and coastal inundation pose risks to the Council organisation by affecting the regulatory environment, Council's own infrastructure, and other public infrastructure, either directly or indirectly through increased cost of maintenance or insurance. It may also expose Council to increased liability and/or potential litigation through the process of developing and implementing policy and/or taking actions (or not taking actions) that are ineffective or maladaptive. It also adds an extra dimension to land use and disaster planning as Councils balance risks of inundation against costs of relocation, rescue or rebuilding that depend on exposure, events and experiences. Decisions, for example, about the location of settlements, infrastructure and utilities have implications on a scale from decades to centuries. Sea level rise also affects how Councils engage with local communities about coastal values and projected coastal change.

Impacts of sea level rise and coastal inundation on the broader community will be felt through negative impacts on private property and potentially on property rights, on public assets and access. These include private residences being inundated occasionally or more permanently; beaches or beach access being eroded and unusable; recreation areas experiencing inundation levels that range from nuisance to more permanent levels thus becoming unusable; and eventually many of these requiring allocation of new lands to house new settlements or infrastructure. Private and public assets will be affected by both chronic events of coastal erosion but also by crisis events of disaster management and longer term progressive inundation affecting access and serviceability of development and localities. Sea level rise will also affect natural assets with loss of species, ecosystems: which is already creating tension between environmental and other community values and assets. It also has impacts across the broader aspects of the Local Government area affecting its economic capacity or competitiveness and causing or exacerbating community disruption or conflict.

While the impacts of sea level rise are familiar ones, the rate of change and/or the scale of change is a new challenge. Inundation and erosion are often existing problems for coastal communities and are already managed through a complex mix of institutional arrangements for disaster management, coastal zone management, land use planning and community futures planning. Local Councils are well versed in dealing with planning and development, hazard management and response, community engagement and negotiating roles and responsibilities with other tiers of government. Yet all these activities are based on what has happened in the past and under a changing climate the future is likely to look very different to the past. On the coast rising sea levels and changes in frequency and intensity of extreme events are expected to lead to more frequent inundation of coastal areas. Response options for rising sea levels are usually discussed as choices between built structures to restrain the sea, adaptation to occasional inundation, retreat from advancing seas, or some combination of these via transitional arrangements. To date one of the key ways for Councils to communicate with property owners has been through notifications on their

planning certificates such as s149 certificates. This has satisfied the regulatory need for communication but has not helped –and often has undermined –a constructive relationship between the Council and community²¹.

However rarely discussed are the practical steps needed to engage the community in discussion of impacts of climate change and what adaptation options are best for *their* coastal community. Such steps would aim to make the community aware of future implications and potential adaptation options that may be available. Decisions about choice and details of the strategy occur at the local level and will have significant and widespread short and long term implications for the value and security of private property, the ecological values of coastal areas, the safety and resilience of settlements, and the cohesiveness of communities. Therefore how a Local Government is able to engage its local community to identify and consider options for future will play an important role in how a community will adapt to a changing climate.

6 Community perceptions of climate change and sea level rise

6.1 Community perceptions of climate change

For Local Governments developing policies to adapt to climate change it is important to understand community attitudes towards climate change and associated impacts such as sea level rise. Here we outline the findings of several recent studies on climate change and related issues^{22,23,24}. Understanding community perceptions can help Local Governments consider how to engage their stakeholders and best tailor climate change-relevant information for their community.

Studies in 2010 and 2011 show that most Australians (around 75%) believe in climate change and largely support the need for action, but are confused about climate change and appropriate policy responses^{22,23,24}. Despite a belief in the need for action, most people are only a little or moderately concerned with climate change as a specific issue and do not consider it poses threat to them personally. Given that people are generally motivated to change their behaviour over issues they consider personally relevant, this presents a challenge for communicating about impacts of climate change in ways that will encourage the community to support policies or take supportive action.

Demographic factors:

- **Gender:** more women likely to believe in human induced climate change than men.
- **Age:** is not a strong influence on beliefs although younger people are more likely to consider the climate is changing
- **Location:** is also not a strong influence on beliefs, but urban individuals are more likely to consider the climate is changing than regional or rural.
- **Political voting intentions:** Beliefs about climate change in Australia are positively influenced by how people intend to vote ('political voting intentions') – left-wing political beliefs are associated

²¹ Morrison, C. and Walmsley, R. 2010 *Is the law a useful communication tool in a changing climate?* NSW Coastal Conference, 2010.

²² Leviston, Z. and I. A. Walker. 2010. *Baseline Survey of Australian Attitudes to Climate Change: Interim Report*. CSIRO, Perth, Western Australia.

²³ Leviston and Walker 2011. Leviston, Z. and I. A. Walker. 2011. *Second Annual Survey of Australian Attitudes to Climate Change: Interim Report*. CSIRO, Perth, Western Australia.

²⁴ Leviston, Z., Leitch, A., Greenhill, M., Leonard, R., & Walker, I. (2011). *Australians' views of climate change*. CSIRO Report. Canberra. www.garnautreview.org.au/update-2011/commissioned-work/australians-view-of-climate-change.htm

with greater belief in human-induced climate change in studies conducted both in Australia and internationally.

- **Source of information:** who or what are trusted sources – is also important for engaging the community programs. Local authorities are not rated highly in terms of trust on climate change information being outranked by other sources of information including, in descending order: scientists, environmental organizations, friends and family, doctors, community people and consumer organisations and then local authorities, government, car companies and oil companies^{22,23}. Hence there is a need for a range of climate change champions across the community. (This approach is being promoted by the National Climate Change Adaptation Research Facility NCCARF through their climate champions program²⁵.)

In NSW, the survey conducted every three years by NSW Department of Environment since 1994, *Who cares about the environment*, most recently published in 2009²⁶, shows that:

Water-related issues and climate change were the most prominent current environmental issues, but this had changed: from 2006 to 2009, nominating water issues decreased from 57% to 42% and climate change increased from 13% to 23%.

In 2009 for the first time, initiatives related to energy and greenhouse were the most often mentioned environmental initiatives for the NSW Government to be undertaking (14%).

More people were optimistic about changes in the environment over the past three years.

Knowledge about the greenhouse effect has increased markedly since 1994, from 24% correct to 51% in 2009.

Over three-quarters believed climate change is happening (78%) and almost as many (69%) believed the NSW Government should take urgent action on this issue.

Some Councils in the Sydney region have also undertaken their own community consultation to determine local perceptions around issues of importance to their constituents. Table 2 shows the coastal values identified by three Councils in the Sydney region through community consultation.

Table 2: Community perceptions of coastal values

Council	Community perception	resources
Manly Council	Community consultation on coastal plans showed sea walls are important to the community	Community consultation North Harbour Coastal Management plans 2010
Pittwater Council	Relevant community priorities: #7 community involvement in Council decision making, #14 managing and protection creeks & waterways, #15 managing natural hazards; #33 coastal environment centre	Community Survey Report 2010 www.pittwater.nsw.gov.au/council/community_engagement/community_survey_results
Randwick Council	Community Survey 2008 shows beaches are a high priority for residents	Community Survey Report 2008 www.randwick.nsw.gov.au/Your_Council/Community_consultation/Buildings_for_our_Community/index.aspx

²⁵ www.nccarf.edu.au/engagement/nccarf-climate-adaptation-champions

²⁶ NSW Government (2009) *Who cares about the environment in 2009?* Department of Environment Climate Change and Water. Sydney.

6.2 Brownlash and ‘denial’ of climate change

Diversity of opinion and scepticism and questioning of science is obviously part of a healthy democracy. However less healthy is a strong denial of environmental problems known as a ‘brownlash’ that sows seeds of doubt amongst policy makers and the broader community through a strong campaign of misinformation in order to bolster a predetermined worldview and support a political agenda.

A brownlash has paralleled a suite of environmental concerns including climate change. For climate change there is a small but vocal and highly visible minority of people who deny either the science or any aspect of climate change. In national polls this is between two and nine percent of Australians²¹ which is consistent with international studies^{27,28}. In developing communication materials about climate change impacts it is useful to understand the characteristics of these denial arguments to better understand these stakeholders.

Denial arguments are classified under five headings by Diethelm and McKee (2009²⁹):

- Conspiracy theories which consider that scientists are engaged in a large conspiracy to create jobs and or funding.
- Use of fake experts who purport to be experts in a particular area but whose views conflict with mainstream science.
- Selectivity by highlighting papers that challenge mainstream science views or using the weakest papers and their flaws to discredit the whole field.
- Creating impossible expectations of research through highlighting uncertainty of models to reject the use and usefulness of models generally.
- Misrepresentation and local fallacies through use of false analogies.

6.3 Community perceptions of sea level rise and impacts concerning property

Until very recently there have been few studies of perceptions of sea level rise either in Australia or internationally. Perceptions of sea level rise determine how people make decisions about both ‘chronic and crisis’ coastal issues including property and preparedness for coastal natural disasters.

In Australia there is a lot of new research underway concerning perceptions relating to land use planning and property issues (the most up to date research project listing is captured in CSIRO’s coastal research portal³⁰). The emerging research shows that the key issues for coastal communities include: perception of risk, how the problem is framed, and tensions over property rights or at least expectations.

²⁷ Doran, P. T. and Zimmerman M. K. 2009. Examining the scientific consensus on climate change. *Eos Trans. AGU* **90**:22

²⁸ Anderegg, W. R. L., J. W. Prall, J. Harold, and S. H. Schneider. 2010. Expert credibility in climate change. *Proceedings of the National Academy of Sciences* 107:12107-12109.

²⁹ Diethelm, P. and McKee M. 2009. Denialism: what is it and how should scientists respond? *The European Journal of Public Health* 19:2-4.

³⁰ www.coastalresearch.csiro.au

6.3.1 PERCEPTION OF RISK

Perceptions of risk are critically important to the social and political context of public policy making as they affect how the risk will be framed and addressed. Public perception of risk relevant to sea level rise include: risks considered in property purchase, the risks to property rights, and risks of natural disasters.

Purchasing property

Governments generally assume that residents will consider and inform themselves about risk to their own properties. In doing so, residents (or potential buyers) either avoid risky or hazardous locations or apply mitigation measures to their homes³¹. However there are many factors taken into account in the purchase of a residence and consideration of natural hazards is just one factor and may depend on variables such as demographics, experience with natural hazards, and length of home tenure. In consideration of where to live, perception of risk of inundation plays a relatively minor role compared to other considerations such as proximity to views or the beach.

Different stakeholders interested in coastal property, such as landowners, property developers and land use planners, have different ideas of what constitutes acceptable risk: developers are found to be less concerned over flooding potential than other stakeholder groups³². Property purchasers have the expectation that if land is approved for development then agencies responsible, i.e. State and Local Government, consider it 'safe'.

For individuals purchasing property, their perception of risk varies considerably. Some people consider the burden of risk is a decision taken by the individual purchaser who should be ultimately responsible for their decision and therefore the principle of 'buyer beware' should be applied^{33,34}). In purchasing property some individuals consider long term issues like sea level rise: but for most property buyers – at least until recently – considering sea level rise in their decision has been overridden by the desire to live near the beach.

People tend to underestimate the risk to their own circumstances. On the Gold Coast, research²⁸ showed that even though residents acknowledged that flooding occurred in their area they underestimated the risk to their own property by not considering that water would cross their property boundary into their home. Also the perception of developers was that residents 'forget' about flooding and their experiences.

Another issue is how coastal erosion is managed compared to other hazard phenomenon. Should extreme coastal erosion events be managed in the same way as other natural hazards such as bushfires³³ Will communities retreat from vulnerable coastal areas? This has been done in other locations to avoid more immediate risks (e.g. retreat from the fire-prone face of Mt. Dandenong in 1970s; abandonment of the Sheltering Palms township in the Byron Shire in the 1970s) or to make way for a valued development (e.g. withdraw from the town of Adaminaby in the 1950s for the Snowy Mountains scheme)?

6.3.2 PROBLEM FRAMING

How an individual considers and responds to an issue involves a series of judgements, perceptions and values that takes place within a social and cultural setting. Thus any communication about climate change impacts is interpreted within a social and cultural setting and so is strongly influenced by how it is 'framed' or organised, presented and debated.

³¹ Zhang, Y. 2010. Residential housing choice in a multihazard environment: implications for natural hazards mitigation and community environmental justice. *Journal of Planning Education and Research* 30:117-131

³² Godber, A., P. Hastings, and I. R. W. Childs. 2006. Local government views on addressing flood risk management on the Gold Coast. *The Australian Journal of Emergency Management* 21:34 - 40.

³³ Leitch A.M. 2010. The role of local media in forming and shaping public opinion on controversial issues: a Byron Shire example. Australian Coastal Council Conference. National Sea Change Task Force. March 2010, Byron Bay, NSW.

³⁴ Beatley, T. 2009. Planning for coastal resilience: best practice for calamitous times. Island Press, Washington, USA.

Important issues of framing that have emerged in the public discourse include:

The uncertainty of the science (or the perceived lack of evidence); affects if and when action needs to be taken. This lack of a clear need for immediate action, particularly if government is perceived to stall, leaves coastal communities questioning the need to act. Why should they act now to halt or reduce development in vulnerable areas if they consider that sea level rise is too uncertain or too far into the future?

Issues of rights and responsibilities: whose role is it to act, whose rights are at stake, who should pay, who should have a say and who decides. (See Section 10 on Community Engagement)

6.3.3 PROPERTY RIGHTS

Rising seas mean a likely increase in conflicts between private property rights and the maintenance of publicly owned coastal ecosystems and beaches. For other conservation issues with a longer history, such as environmental water-flows or native vegetation clearing, conflicts between private property and the environment have proved difficult to resolve.

In terms of rising seas we know that there exist strong and conflicting opinions on issues such as who is responsible for making decisions that affect the risks to private property. The issue of property rights includes debate about:

- The tension between protecting private assets and protecting public assets, for instance should protecting public assets be at the expense of private assets, or vice versa?
- The need to protect or set aside space for environmental assets such as coastal ecosystems³⁵
- Whose role it is to protect affected private assets. Can or should governments be able to alter property rights if sea level rise makes a property unsafe³⁶. There is a related issue of the legitimacy of government intervention to protect coastal communities and ecosystems.
- What are the financial implications of changing property arrangements? Who is responsible for the loss of a property or compensation? Who should pay for property damage; or under what circumstances can individuals be asked to move from their property or accept a change in inundation risk³⁷.
- Will their property values be affected? There are mixed results on effects of property prices through notifications on property certificates or investigation areas being declared. For example, there are media reports of reduced coastal land values in Byron Shire and water front land in Ballina³⁸ assumed to be due to notifications on the title³⁹ or indirectly through reduced confidence in real estate. However the global financial crisis and general downturn in property may also cloud any impacts on property values.

³⁵ Abel, N., Gorddard, R., Harman, B. Leitch, A.M., Langridge, J. Ryan, A. and Heyenga, S. 2011. Sea level rise, coastal development and planned retreat: analytical framework, governance principles and an Australian case study. *Environmental Science & Policy* 14:279-288.

³⁶ Ryan, A., Gorddard, R., Abel, N. Leitch, A.M., Alexander, K. and Wise, R. 2011. Perceptions of sea level rise risk and the assessment of managed retreat policy: results from an exploratory community survey in Australia. CSIRO.

³⁷ Leitch, A. M. and Robinson C. J. 2012 Shifting sands: uncertainty and a local community response to sea level rise policy in Australia. In: T. G. Measham and S. Lockie, eds. *Risk and Social Theory in Environmental Management*. CSIRO Publishing.

³⁸ Walsh, A. 2012. Waterfront land losing value in Ballina. *Property Observer* 5 March 2012.

www.propertyobserver.com.au/residential/waterfront-land-losing-value-in-ballina/2012030453596

³⁹ express-advocate-gosford.wherelive.com.au/news/story/residents-furious-as-home-values-threatened/

7 Councils' perceptions of climate change and adaptation

Local governments have generally recognised the important role they play in adapting to a changing climate but there is a lot of evidence that individual Councils are struggling to plan and implement climate change adaptation. The cited reasons are: lack of information, constrained financial and human resources, lack of skilled / trained personnel, community concerns, competing pressures and responsibilities, and lack of support or progress by other tiers of government. These are discussed.

- Lack of local information sufficient for decision making.

Councils have commonly reported that a lack of information – in terms of locally relevant, accessible and useful information sufficient for guiding action – makes it difficult to make decisions about appropriate and effective action. Science has often been regarded as providing the wrong sort of information. Place-specific projections are called for by Councils: a lack of these is used as an excuse for delaying decisions or action.

- Lack of financial and human resources.

Councils are constrained in their financial resources to deal with sea level rise as well as other climate change impacts. The lack of available information makes action expensive if it is not necessary or is maladaptive. Their financial situation is also complex and constrained by institutional arrangements such as State legislation which outlines Local Government's ability to increase their revenue, and allocate funds.

- Lack of community concern or backlash from the community

Some Councils report that apathy from their community about climate change makes it difficult to allocate resources to what is essentially a low community priority³⁷. Others report strong community opposition, either perceived or real, inhibits action on climate change.

- Complex competing responsibilities

Councils have a broad range of roles and responsibilities with a growing list of complex issues. This competition for attention and resources some Councils give as a reason for delaying action.

- Lack of progress or support from other tiers of governance

Councils – with powers determined by the State government but elected by the community – operate within a complex web of institutional arrangements that pose challenges to how roles and responsibilities are articulated and implemented. For some Local Governments the perceived lack of progress at international and national levels on negotiations on greenhouse gas emissions is sufficient to stall action for governments already struggling with community perceptions or resourcing constraints.

The lack of clear direction from state governments is also constraining. While most Australian States or Territories are developing planning tools in the form of policies and benchmarks, from the Local Government perspective these are often regarded as insufficient. For example the current NSW planning system for sea level rise is considered fragmented and lacking a clear process for implementation although it does provide significant guidance in relation to sea level rise benchmarks and the technical aspects of their application in both strategic planning and development assessment activities⁴⁰. The Environmental

⁴⁰ Environmental Defenders' Office. 2011. Audit of Sea Level Rise, Coastal Erosion and Inundation Legislation and Policy. Report by the Environmental Defender's Office, New South Wales for the Sydney Coastal Councils Group, NSW. Available from www.sydneycoastalcouncils.com.au/Project/Mapping_and_Responding_to_Coastal_Inundation

Defenders Office also suggests that there is a need for more robust and responsive planning framework that allows for impacts of sea level rise to be monitored and adjusted. The NSW government has announced a review of coastal arrangements in September 2012⁴¹.

7.1 Review of LAPP projects

A recent review of the Local Adaptation Pathways Program (LAPP), an initiative of the Australian Government to fund Councils response to climate change was undertaken in 2012⁴². This review looks at the efforts of Councils planning for climate change under the LAPP: it gathers information from 94 Councils and consolidates nearly 7000 risks and adaptation actions identified by these local authorities. It also consolidates about 700 actions to reduce the impacts of climate change on their communities. Many of these are already being undertaken by Councils as good risk management practices.

The report suggests that almost half of the actions are already included in Council's actions or plans and so are of little or no extra cost. Other suggested actions are considered to be within Councils reach or could be undertaken in partnership with other agencies or groups to spread the costs and risk burden.

This review found that increase in mean or average sea level rise, and extreme sea levels are regarded by Councils as one of the most important climate hazards. Similar to the types of issues raised by the community, Councils also express concern about coastal infrastructure and how to balance issue of property value and development and devaluation of property. Concerns raised by the Councils in this review include four areas of Council interest: community interest, infrastructure, land use and governance.

The top concerns over risks due to sea level rise are for:

- community support
 - emergency services are stretched or inadequate
 - impaired individual or community health due to loss of homes due to property damage
 - impacts on tourism or ecotourism
 - eroded or altered green areas
- infrastructure
 - disruption to transport infrastructure
 - disruption to power supplies and loss of services
 - strain or failure of solid waste treatment plants
 - salt water intrusion affecting pipe works and freshwater reservoirs
- land use
 - coastal ecosystem change and loss including impacts on wetlands
 - soil impacts such as salinity due to inundation
- governance
 - increased operational expenses as well as capital expenditures

⁴¹ www.environment.nsw.gov.au/coasts/stage1coastreforms.htm. Accessed September 2012

⁴² Climate Risk (2011) Climate change risk, adaptation and evolution in local government. Practical insights from the Local Government Adaptation Pathways Project. Report prepared for DCCEE, Canberra.

- degradation of Council property, building and lands
- loss of value or reduced life span of Council assets
- increased insurance costs for both assets and operations
- damage to Council's reputation and litigation due to under or over action by Councils.

8 Summary

Coastal institutions are more effective if they have the understanding and support of the community. Yet the above description of the context highlights the complexity faced by Local Governments in developing and implementing coastal policies, particularly concerning property.

Gaining the support and understanding of the community requires being able to engage the community and take account of the current and future community aspirations for the coastline. This also highlights the need for and importance of carefully designed and strategic engagement and communication programs that can build on Councils' positive community relationships and work through existing communication and engagement activities. It also highlights the need to deal not only with people directly affected by potential sea level rise but also to initiate broader discussion with the wider community about coastal values.

Clearly leadership, collaboration and consistency from all tiers of government to coastal issues would also support Councils in engaging the community for planning and managing sea level rise.

Part IV Frameworks for risk communication & community engagement

9 Risk communication

As our climate changes there is likely to be changes in our coastline that affect how we live in coastal areas. Increasing there is a move to encourage communities to become more resilient to climate change impacts. This involves taking a risk communication approach that highlights “living with risk”.

9.1 Communicating ‘Living with risk’

Projected changes in climate include increases in extreme weather events and therefore natural disasters. Coastal communities need to adapt and prepare for these events and governments have a role to support this type of adaptation. Increasingly the approach being adopted is to develop the resilience of communities to natural disasters through encouraging ‘living with risk’. Through this approach authorities focus on ensuring the public is aware of the risk and what is an effective personal and community response.

Some Councils are already taking a resilience approach which involves new ways of thinking and communicating about risks and natural hazards as well as new ways of engaging their community.

9.2 Background to risk communication

Communication and roles and responsibilities for hazard management and response are clearly articulated through NSW disaster management plans and planning⁴³. However, current planning legislation across Australia has very few explicit requirements of how to communicate about specific hazards such as coastal erosion, coastal inundation or sea level rise⁴⁴. For example, one tool mandated in legislation in NSW, the Section 149 certificate (s149) within the NSW Environment Planning and Assessment Act 1979, only communicates directly with individual land owners not the community more broadly and are only used at certain times such as when properties are sold. New communication approaches are needed that consistently and appropriately engage a wide variety of residents in planning processes for coastal inundation¹⁹.

Local Governments play a major part in managing risk through their contributing role in emergency management, and significant role in land use planning and community planning in line with community values and aspirations. A risk communication approach is one approach Councils can use to underpin their communication on sea level rise. Risk communication is a large and diverse discipline generally dealing with issues of safety, health, chemical and natural hazard or environmental risks.

Over the past four decades risk communication has evolved from attempts to change public views about risk, or increase public acceptance of particular risks, to attempts to increase public trust in risk management agencies. Whereas traditional risk communication emphasised scientific and expert knowledge and one way communication, contemporary risk communication emphasises balancing a range

⁴³ See the NSW State Disaster Plan: emergency.nsw.gov.au/plans

⁴⁴ Morrison, C. and Walmsley, R. (2010) Is the law a useful communication tool in a changing climate? NSW Coastal Conference, 2010.

of knowledge from different sources and creating opportunities for shared learning and innovation. According to Gilmour *et al.* (2011):⁴⁵

“Risk communication can become a powerful component of risk management if it is undertaken at the local level, with local people determining the way the message needs to be delivered and what its content should be, so that it will align with the motivations and values of local people”

Broadly the principles of risk communication are very similar to the general principles of stakeholder engagement and conflict resolution. However they become more nuanced when applied as the complex nature of the issues tend to bring in a range of types of stakeholders, emotions, values, conflicts and power plays.

Important for risk communication are issues such as reliable and accessible information, the credibility of the organisation communicating or managing the risk, fairness of the process, fairness of the outcome, and trust amongst those involved. It is important however that the process is not just about increasing acceptance of a particular policy or action but a genuine attempt to facilitate and incorporate stakeholder perspectives and knowledge through broad and inclusive community engagement processes.

9.3 A framework for risk communication

There are many risk communication frameworks and one that is useful for local authorities communicating and managing sea level rise is developed by Lundgren and McMakin (2009)⁴⁶. Their framework offers a useful categorisation because the risk of coastal inundation intersects with a Council’s functions in several ways. It impacts how Council and the community prepares for both the crisis aspects of sea level rise in preparing and managing disaster response and the more ‘chronic’ aspects of sea level rise which involves managing community values and aspirations for the coastline into the future.

This framework considers three types of communications based on the direction of communication and the types of knowledge and messages required. How these relate to Councils managing coastal inundation are summarised in Table 3. The three types of communication are:

Crisis communication: Persuasive communication to direct risk related behaviours. This involves predominantly one way communication of expert knowledge. For example, disaster response communication: the Council, together with other disaster managers, has clear roles and responsibilities and lines of communication to deliver clear (one way) messages about harm and avoiding future or potential harm.

Care communication: Predominantly one-way communication mainly aimed at educating the public at risk and to gain consent for risk management practices and measures. It involves a mix of technical and local experience and knowledge. For example, disaster preparedness planning: Council communicates to residents what to do to be ready for potential disasters but can also gather experience from the community about what helps and hinders disaster response based on previous experience. Messages are two way about preparedness and planning.

Consensus communication: Multi directional communication and exchange in which all actors engage with, and learn from, each other. This involves a range of different types of knowledge including expert and local

⁴⁵ Gilmour, J., R. Beilin, and T. Sysak. 2011. Biosecurity risk and peri-urban landholders: using a stakeholder consultative approach to build a risk communication strategy. *Journal of Risk Research* 14:281 - 295.

⁴⁶ Lundgren, R. and McMakin, A. 2009. Risk Communication: A Handbook for Communicating Environmental, Safety and Health Risks, Wiley-IEEE Press.

knowledge including values and aspirations. For example, 'futures' planning: Councils use a mixture of technical knowledge and local knowledge (including values and aspirations) to plan for the future. Councils need to take care to ensure the dialogue encompasses a broad cross section of the community including traditionally 'hard to reach' groups (e.g. older people, women, youth, shift workers).

Different risks have differing proportions of need for expert and non expert knowledge. Expert knowledge is used to determine the scientific basis of the risk: and local knowledge determines how the community interprets and responds to the risk including in the past as well as the future. Across the community there is a diversity of levels of awareness and concern about particular risks. Both levels of awareness and concern present challenges for communication. Low levels of awareness can mean it is difficult to motivate interest or action: while high levels of concern may mean that strong emotions present challenges in communicating with upset or angry people.

Designing risk communication plans for sea level rise requires attention to all three types of risk communication.

Table 3: Summary of risk communication framework

Characteristics	Three types of risk communication		
	Crisis communication	Care communication	Consensus communication
Direction of communication	One way information from Council to community	Mostly one way information from Council to community. Some information from community to Council about: local knowledge of barriers and enablers for action; what has occurred in the past	Multi directional between experts, Council and community sharing and integrating knowledge
Types of knowledge	High expert knowledge Some community knowledge about how they have managed in the past	Moderate expert knowledge including technical & policy knowledge Moderate community knowledge including historical knowledge of events, socially relevant experience	A range of knowledge used Local expert knowledge High community knowledge
Types of messages	Information about harm mitigation, procedures, possible additional harm; e.g. what to do in emergencies	Information about avoiding future risk, preparedness, planning; e.g. how to reduce risk of disasters	Sharing information about values and aspirations; e.g. being a resilient community
Examples of Council activities	Disaster response planning at the community scale	Land use planning Disaster preparation planning at individual & group scale Integrated coastal management	Integrated coastal management
Examples on the coast	Expert understanding of the nature, scale, likely impact of the hazard e.g. storm events, tsunami, extreme events	Response/ responsibility of community to prepare for natural hazards e.g. household evacuation plan	Community engagement to ascertain community values and aspirations for the future including tradeoffs
Typical methods	Advertisements, fact sheets, web pages designed to impart facts, directives	Community consultation through surveys, focus groups	Scenario planning for future
Typical preparation and resourcing	Council staff prepare facts for local context from existing or commissioned knowledge such as Council process and projects, state government information etc	Council staff organise events to gather local input on barriers and enablers, provide feedback to community Mostly uses existing consultation processes of disaster planning, land use planning	Council organises knowledge sharing events to blend expert and local knowledge, values and aspirations. Requires expert knowledge to prepare scenarios. Requires genuine engagement processes across the community
Resourcing	Moderate – mostly staff time Generally uses existing information from Council's and other government resources (e.g. NSW DISplan). Involves: range of disaster expertise	Moderate Mostly uses existing information and Council processes Some experts needed Involves Local scale	High Requires Councils to facilitate community engagement and community knowledge processes Involves experts and series of community events

Source: adapted from Lundgren and McMakin (2009)

10 Community engagement over coastal values

‘Community engagement’ has become a broad and loose term for Councils to describe the process of information sharing and gathering: not all of which are strictly community ‘engagement’. Genuine community engagement processes are defined in a recent review by the Australian Centre for Excellence in Local Government⁴⁷ as: ‘a two way process of dialogue by which the aspirations, concerns, needs and values of the community are incorporated into policy development, planning, decision making, service delivery and assessment’.

Citizens are increasingly seeking direct ways to be more involved in public decision making particularly on issues in which they have a direct interest⁴⁰. A key challenge for Local Governments is finding ways to involve these citizens in an effective way but also to engage with citizens who have a less direct interest (for any number of reasons) or who tend to have barriers or constraints over their involvement.

A Council can use the risk communication framework of ‘crisis, care and consensus’ together with the International Association for Public Participation (IAP2) framework to develop an approach to structure their communication around coastal inundation.

10.1 International Association for Public Participation (IAP2)

One model increasingly used by Local Governments for thinking about community engagement at the local level is a participative approach based on the principles of IAP2.

The IAP2 spectrum of public participation has been adopted by many Local Governments in Australia. The IAP2 spectrum identifies five participation goals on a progressive scale of public participation forms ranging, based on levels of information and consultation, from weaker to stronger goals. The spectrum is a valuable tool because it recognises that ‘higher’ levels of community participation allow for increased capacity for conflict resolution, innovation and problem solving. It is important to match the issue with the right level of engagement: not every issue or problem requires more significant levels of engagement such as ‘collaboration’ or ‘engagement’. Many issues are dealt with through ‘informing’ the community.

The different phases of the IAP2 spectrum are described in the table below (Table 4). Local government tends to use the steps ‘inform’, ‘consult’ and occasionally ‘involve’ and rarely ‘collaboration’ or ‘empowerment’. Some Councils (e.g. Wellington Shire Council and City of Onkaparinga in Victoria) remove the ‘empower’ column when they use the IAP2 framework as they consider ‘empowerment’ occurs when Council is elected through local elections.

Table 4 outlines the general elements of the IAP2 including the phases, the goals of each phase, the ‘promise to the public’ of each phase and various techniques appropriate to each phase. Note that these techniques while considered to be generally suited to a particular phase, their suitability actually depends on how each is implemented. Table 5 outlines a case study of IAP2 being used by Wellington Shire Council. Methods of engagement used in the Wellington Shire include, but are not restricted, the methods outlined in the Table. More information on the Wellington Shire case study is also in Part V, 11.2).

⁴⁷ Herriman, J. 2011. Local Government and Community Engagement in Australia. Working Paper No 5. Australian Centre of Excellence for Local Government, University of Technology Sydney.

More information about IAP2 is available from their website (www.iap2.org.au). Councils need to join this association to have full access to materials, tools and training.

Table 4: IAP2 spectrum for community engagement

Inform	Consult	Involve	Collaborate	Empower
Public participation goal				
To provide balanced and objective information to assist understanding of topic, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work with the public throughout the process to ensure that concerns & aspirations are consistently understood & considered	To partner with the public in each aspect of the decision including development of alternatives and identification of preferred solution.	To place final decision making in the hands of the public
Promise to the public				
We will keep you informed	We will keep you informed, listen and acknowledge concerns and aspirations, and provide feedback on how input influenced the decision	We will work with you to ensure that your concerns & aspirations are directly reflected in the alternatives developed & provide feedback on how input influenced the decision.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advice & recommendations into the decisions to the maximum extent	We will implement what you decide
Techniques to consider (see also Table 5 for case study)				
Fact Sheet Web site Advertisement Media release Newsletter Email list Social media	Public comment Focus group Surveys Stakeholder meeting Shopfront Phone hotline Briefings Feedback forms Social media	Workshop Deliberate polling Social media Advisory groups Discussion forums	Advisory Committees Deliberative Dialogue	(Empowerment depends on how this information is incorporated – i.e. how much power is handed to community) Summits Deliberative Democracy Deliberative forums Citizen’s panels Citizen juries

Source: IAP2 adapted by authors

Table 5: Case study of the use of IAP2 by a Council: Wellington Shire Council Victoria

Case study: Wellington shire Council implementation of IAP2

Wellington Shire Council in Gippsland Victoria developed a Community Engagement Framework using the IAP2 framework. Tools and methods of engagement identified in the Wellington Shire community engagement framework include, but are not restricted to, those outlined below.

Inform

Letters - personally addressed letters to affected households. It will outline the issues and invite comments and participation in engagement activities.

Unaddressed mail - this is a non-addressed leaflet, flyer or letter that summarises the issues. It may invite feedback or simply provide post engagement feedback to participants.

Advertisements in local newspapers - Ads in Wellington News or other sections of the newspaper are important means of communicating with a large number of community members. Advertisements are often used to invite residents and ratepayers into the community engagement process.

Special publications – Council may produce special publications to provide updates to community members on special projects, areas of interest or engagement. Special publications are distributed via mail, unaddressed mail, Council facilities and Council’s internet.

Shopping centre displays - shopping centre displays are an opportunity for community members to drop in and talk to Council staff. They are a useful information tool and can obtain feedback from the community on Council initiatives.

Wellington Matters - is produced quarterly and distributed to homes in the Shire. It includes articles on community engagement activities, special projects, infrastructure works and capital projects. Wellington Matters can also be used as a way of distributing survey’s and engagement updates.

Consult

Survey – survey’s can be conducted by independent survey specialists or Council using staff expertise. Survey’s can be conducted by phone, online, written, doorknock or telephone.

Focus groups – focus groups are often used to distribute information and gather ideas and views from community members.

Information sessions – information sessions are similar to public meetings where the community is broadly invited to attend, however there is no public meeting forum involved. Individuals who attend are given one on one time with Council staff to discuss specific issues, concerns or recommendations. One-on-one sessions were identified through the community engagement activities as important opportunities for community members who don’t feel comfortable discussing their private concerns or business in a large public gathering.

Involve

Working groups/special interest/user groups - individuals are invited to assist Council by representing various interest, points of view and fields of expertise.

Working groups and special interest groups etc are often formed when engaging with a broad group of community members for an extended period of time. Members are often self nominated or nominated by groups already involved with Council such as Community Representative Groups.

Collaborate

None identified

Empower

Through Council elections

10.2 Tools for communication and engagement

There are a variety of tools available for different types of communication or engagement. These are summarised in the Table 6. For each tool there is a brief description, an indication to what level of engagement it is most suited, and a relative indicator of resources required in terms of staff time ☹, cost \$. (Many of these tools can be outsourced to communication professional if there is no internal expertise.)

There is also an indicator of 'caution required' 🙅 for different tools: these tools need to be used thoughtfully with clear objectives and design. For example; ensure the members of advisory group understand their role; expert panel – are the experts accepted as experts by the community?

Table 6: Communication and engagement tools

Key: Staff time ☹; cost \$; caution 🙅

Tools	Information	Engagement Level					Resources
		Inform	Consult	Involve	Collaborate	Empower	
Advertisements	Consider more effective media for your audience	!					\$\$
Advisory group	Group of representative people meet to provide input to planning process	!	!	!	!		☹☹, \$, 🙅
Appreciative enquiry	Systematic process exploring narratives to build innovation and commitment to action	!	!	!			☹☹☹, \$\$\$, 🙅
Bill stuffers	Information sent with Council bills	!					\$
Briefings	Given at existing social club meetings	!	!				☹
Certificates	Information included on planning certificates	!					☹, 🙅
Citizen juries	Small groups gather to learn or examine expert information	!	!	!	!	!	☹☹☹, \$\$\$, 🙅
Community fairs	Central event with multiple activities to raise awareness	!					☹☹☹, \$\$\$
Community profiling	Desktop review of aspects of community. Can be done with, or prior, to survey method						☹, \$
Conference	Large meeting with range of speakers around related topics	!					☹☹☹, \$\$\$,
Consensus conference	A public meeting in which citizens assess an issue. Dialogue is between citizens and experts with the citizens leading the agenda. Citizens are selected for their diversity of views	!	!	!	!	!	☹☹☹, \$\$\$,
Deliberative opinion polls	Measures informed opinions on an issue – over 2-3 days	!	!	!			☹☹☹, \$\$\$,
Delphi study	Tool to obtain opinions and agreement without formal meeting.	!					☹, \$

Tools	Information						Resources
		Inform	Consult	Involve	Collaborate	Empower	
Design charrettes	Intensive session to design project features – joint problem solving	!	!				⊕, \$
Display & exhibits	Posters, displays. May have interactive element	!	!				⊕⊕, \$\$
Expert panel	Public meeting with technical experts. Need the right experts who are credible, articulate!	!	!				⊕⊕, 🖐️🖐️, \$
Feedback forms	Include in range of materials. Use prepaid post. Staff follow up	!	!				⊕, \$
Field trips	Tours of facilities, affected sites. Lots of logistics	!	!				⊕⊕⊕, \$
Fishbowl	A meeting where decision makers show work transparently – in a ‘fishbowl’ – so observing public understands process	!	!				⊕⊕⊕, \$
Focus groups	Use randomly selected people to test decisions, messages, ideas	!	!	!			⊕, \$
Future search conference	Considers the future of network, organisation, or community	!	!	!	!		⊕⊕⊕, \$\$, 🖐️
Information hotline	Specific phone line or social media feed to access specific knowledge	!					⊕⊕
Information repository	Libraries, Council offices, schools. Need to be current and monitored	!					\$
information kiosks	Temporary or permanent information stations	!					\$\$\$
List serves – e.g. email lists	Residents opt to join an electronic mailing list that requires updating, maintenance.	!					⊕
Kitchen table discussions	Small neighbourhood meeting in home – relaxed setting	!	!				⊕⊕⊕, \$
Media release	Also media kits with background information	!					⊕
Multi objective decision making	A decision making tool for complex problems where there is not optimal solution and many parties are affected. It takes account of multiple criteria using decision makers preferences to differentiate between solutions.	!	!				⊕⊕, \$\$
Newsletters (or any direct mail)	Printed or email, requires effective distribution. Include opportunities for feedback	!					⊕, \$
Newspaper inserts	Fact sheet, wrap around in local newspaper	!					⊕, \$\$\$
Open house	Public tours facility at their own pace, includes several information stations	!					⊕⊕⊕, \$, 🖐️

Tools	Information						Resources
		Inform	Consult	Involve	Collaborate	Empower	
Open space technology	Participants decide on agenda and participate in sessions according to interest	!	!	!	!		⊕ ⊕, \$
Photo-voice, aural histories	Collecting and studying historical information articulated by individuals or groups through photos or recordings	!	!	!			⊕ ⊕, \$\$
Print information	Fact sheets, brochures	!					⊕ ⊕, \$\$
Public meeting	A large group meeting open to the public. May be organised by interest group	!	!				⊕, 🖐️ 🖐️
Surveys or questionnaires	Can be representative or non representative so result needs careful interpretation. Can be mailed or web based.	!	!				⊕ ⊕, \$\$
Samoan circles	Leaderless meeting 10-500 people that stimulates participation	!	!	!			⊕ ⊕, \$, 🖐️
Scenario testing, visioning	Group learning activity to develop an understanding of a situation.	!	!	!			⊕ ⊕, \$\$
Social media: twitter, facebook	Reaches different demographic. Can be used in more interactive way to consult	!	!	!			⊕
Stakeholder analysis	Desktop review of what is known about key stakeholder groups. Can be done with survey						⊕, \$
Study circles	Highly participatory involving many small groups aiming to contribute to their community	!	!	!			⊕, \$
Submissions	Citizens are invited to comment on specific policies or activities	!	!				⊕ ⊕, \$
Technical assistance	Access to technical experts such as planners	!	!				⊕ ⊕, \$
Technical report & discussion papers	Report technical, research or policy information, reasoning. Need plain English summaries	!					⊕, \$
Websites	Need to be clear, searchable Can be more interactive	!					⊕
Workshops	Meeting moves from formal presentations to informal and interactive group discussions	!	!				⊕ ⊕, \$\$
World cafe	Concurrent meetings to discuss series of topics. Groups move around tables	!	!				⊕ ⊕, \$

Source: author plus information adapted from Coastal CRC Citizen science tool box, IAP2 tool kit

10.3 Other community engagement resources

Community engagement is a strong feature of modern democracy which means there are a growing number of resources available to support Councils in identifying novel but tested tools and processes. Table 7 provides a list of such resources and a brief evaluation to help guide users.

Table 7: Community engagement resources

Scale	Name	Resource	Description	Access at:
International	Active Democracy (Australia based)	Website	An Australian-based site with links to many community engagement resources, reviews and some case studies. It also features information on engagement methods	www.activedemocracy.net
	People and Participation.Net (UK based)	Website	A UK based site featuring practical information for those working to involve people. You can upload case studies, put questions to experts.	www.peopleandparticipation.net
	National Coalition of Dialogue and Deliberation (NCDD) (USA)	Website	A US-based website attracting members from more than 1,400 organisations and professionals from 40 countries. It offers free access to thousands of resources and best practices including 'best of the best resources' which highlights recommended books, guides and tools about dialogue, deliberation and public engagement	ncdd.org
	Participedia (international)	Wiki	This wiki allows researchers and practitioners around the world to post narratives and data about any kind of process or organization that has democratic potentials. It includes articles on a range of participatory methods and participatory governance	www.participedia.net
National	National Standards for community engagement	Guidelines	Best practice guidelines for engagement between communities and public agencies. Developed through interviews with community and agency representatives.	www.scdc.org.uk/what/national-standards/
	Review of Local Government and community engagement in Australia	Working Paper	A national snapshot of current community engagement practices of Local Government. It also identifies the challenges for Councils in engaging the community. It outlines influences on community engagement such as legislative change, changing expectations of the community and knowledge exchange amongst Local Government around engagement.	acelg.org.au/upload/program1/1320191471_Community_Engagement_web.pdf
State	Building Sustainable Communities, NSW	Website	This site aims to help local communities across the state share ideas on how to enhance and strengthen their community. Users contribute to the content and ongoing development of the website with case studies and tips. The site features practical resources including checklists, case studies, a discussion forum and an events calendar.	environment.nsw.gov.au/resources/community/110563BldSustComs.pdf
	A Guide for Engaging Communities in Env Planning & Decision Making, NSW	Booklet online	An older resource (2006) designed specifically for environmental planning but still has useful concepts	environment.nsw.gov.au/resources/warr/2006288_engagingcommunities.pdf
	Community Engagement Guide, Qld	Online resources tools	A series of generic guides designed to provide practical advice and information for community engagement practitioners including: community engagement methods and techniques, community engagement for government and engaging different types of groups.	www.qld.gov.au/web/community-engagement/

Scale	Name	Resource	Description	Access at:
	Community Engagement Handbook, SA	Online guide	A model framework for leading practice in community engagement in South Australia	www.lga.sa.gov.au/goto/engage
	Community Engagement Policy Development Guide, LGAQ	Online guide	Guide to assist Local Governments to develop and implement a policy (rather than strategy) for community engagement	lgaq.asn.au/c/document_library/
	Pittwater Shire Council, NSW	Online Community Engagement Toolkit	Guide to ensure that all consultation between Pittwater Council and the community is conducted in a manner that is transparent, seeks to engage the community and demonstrates a genuine approach to this process. It is devised to strengthen and promote carefully planned community engagement strategies that achieve the desired outcomes of informing the community, gaining valuable feedback and connecting with the community in a way that enhances decision making outcomes.	www.pittwater.nsw.gov.au/council/community_engagement
	Warringah Shire Council, NSW, Community Engagement Framework	Online framework and toolkit	A guide to provide Council staff with practical guidance on different tools and techniques that can be used to undertake different types of community engagement. The Toolkit is part of a total Community Engagement Framework developed by Council to encourage effective engagement with the community and internally.	www.warringah.nsw.gov.au/council_now/com_consult.aspx
	Sutherland Shire Council, NSW, Community Engagement Policy	Online	The purpose of this Policy is to define Council's commitment to community engagement, and in doing so, ensure that Councillors, Council officers and the community apply this to their own role.	www.sutherlandshire.nsw.gov.au/Council_The_Shire/Policies_Forms
Local	Randwick City Council, NSW, Community Consultation Principles and Planning Guide	Online framework and guide	Consultation Planning Guide has been developed to assist staff in implementing Randwick Council's Community Consultation Principles. It is a dynamic document that will evolve over time taking into account community and organisational needs, emerging technologies and developing best practice. Outlines different methods for different levels of engagement indicating which are essential and which should be considered. Also includes a consultation plan template.	www.randwick.nsw.gov.au/Your_Council/Community_consultation/index.aspx
	Clarence Community Participation Plan 2010, Tasmania	Guidelines	A guide for community participation in the Clarence region. It includes a communication planning guide as well as case studies of communication plans for participatory processes.	www.ccc.tas.gov.au/webdata/resources/files/community_participation_policy.pdf
	City of Onkaparinga, Victoria, Engagement Framework	Online framework	A very concise framework based on a reduced IAP2 and OECD engagement models. It aims to ensure Council provides clear and objective information and offer opportunities for people to participate in decision making that affects them.	www.onkaparingacity.com/custom/files/docs/community_engagement_framework.pdf
	Gosford City Council, NSW, Draft Climate Change Community Engagement Strategy	Online draft strategy	A draft community engagement plan around climate change issues but incorporating sea level rise issues. It outlines engagement that has been undertaken to date and suggested activities for specific stakeholders.	www.gosford.nsw.gov.au/tenders/climate-change-awareness-raising-and-issues-management/Community%20Engagement%20strategy%20draft.pdf

Source: authors

Part V Case studies

A number of Australian and international case studies are presented here to highlight how local or regional, or even national, organisations in various contexts are approaching communication around natural hazards, coastal inundation or sea level rise.

The case studies were chosen because they highlight examples of planning for natural hazards, preferable coastal, and were organised at the local scale, engaged (or attempted to engage) the community in planning, and their efforts have been highlighted through either community or peer evaluation.

All of these case studies are 'works in progress' at the time of writing: the emerging nature of planning and communicating coastal inundation in a climate changed world means that they are taking place in a changing and challenging legislative and institutional arena. We hope that these case studies provide useful examples from which others can learn or take innovation or inspiration.

Australian case studies include four Local Governments currently planning for sea level rise:

- Lake Macquarie City Council
- Gosford City Council
- Wellington City Council in Victoria
- Clarence Council in Tasmania.

International case studies are more varied and include:

- North Vancouver, Canada and their experience of managing landslips
- UK and an interesting 'visioning' project
- Virginia Beach in the United States and a community engagement project
- A European Union project supporting community engagement in coastal planning in several countries
- New Zealand's approach to coastal hazards and sea level rise

We now present these in some more detail.

11 Case studies from Australia

Many local authorities are considering how to respond to sea level rise and are in various stages of planning for it. Many of these local Councils are grappling with how to inform or engage their local community with varying degrees of success.

Table 8 Summary of Australian case studies

Location	Summary	Key resources
Lake Macquarie, NSW	Lake Macquarie is a NSW coastal erosion hotspots Lake Macquarie City Council has used a broad community engagement strategy in planning for coastal inundation Council's sea level rise planning was named as a Climate Adaptation Champion by NCCARF in 2011	www.lakemac.com.au/environment/climate-change www.lakemac.com.au/eshoreance www.lakemac.com.au/downloads/Lake Macquarie Sea Level Rise Preparedness and Adaptation Policy.pdf
Gosford, NSW	The Gosford area has a long history of flooding and is highly vulnerable to coastal inundation Gosford Council tried to engage the community around issues of sea level rise but there was little community interest until it began to formally advise property owners through S149 certificates. This formal notification has recently been taken off the certificates due to community backlash.	www.gosford.nsw.gov.au/gis/slr Includes fact sheets, slr maps
Wellington Shire Council, Victoria	Wellington Shire has a coastline vulnerable to rising seas and is under pressure from development Council developed the Coastal Towns Design Framework in 2008 as a joint initiative with East Gippsland Shire Council to engage the community on coastal issues	www.wellington.vic.gov.au – look for the <i>Coastal Towns Design Framework</i>
Clarence City Council, Tasmania	Lauderdale in Tasmania is highly vulnerable to sea level rise impacts. A highly participative process, more recently through the LAPP program, is identifying scenarios of preferred options through a series of community workshops	www.ccc.tas.gov.au/page.aspx?u=1630 Includes a range of workshop materials

11.1 NSW: Lake Macquarie City Council



- **Lake Macquarie City Council (LMCC) is one of NSW's coastal erosion 'hot spots'. It also has to consider projected impacts of sea level rise for Lake Macquarie, which is still water and sits higher than the ocean, and which will be affected by a number of localized processes.**
- **LMCC was named one of six 2011 Climate Change Adaptation Champions from around Australia, for climate change preparedness planning. Their 2012 residents' survey was very positive with around three quarters or participants pleased with Council across a range of indicators.**
- **Source: Information adapted from Lake Macquarie Council's website, 2012 and DCCEE 2009**
- **Useful resources: [www.lakemac.com.au/downloads/Lake Macquarie Sea Level Rise Preparedness and Adaptation Policy.pdf](http://www.lakemac.com.au/downloads/Lake%20Macquarie%20Sea%20Level%20Rise%20Preparedness%20and%20Adaptation%20Policy.pdf)**

The City of Lake Macquarie (population approximately 200,000 people) is part of a coastal metropolitan area, known for its 'leisure lifestyle', located approximately 200 km north of Sydney and 15 km south of Newcastle. This area was identified as one of the places most vulnerable to sea level rise in NSW by the Department of Climate Change's First Pass Assessment in 2009. About 5,100 and 6,800 buildings will be potentially affected by sea-level rise and storm tide inundation by 2100: the upper range is approximately 10 per cent of the current residential building stock.

The lake area is also vulnerable: the average level of the Lake is currently about 0.1 metres higher than the Pacific Ocean. Council expects the waters of the Lake will rise in line with sea level rise: the pumping effect of tides through Swansea Channel and other localised factors mean there will be local variations. Council will use the predicted sea level rise of 0.90 metres by 2100 as the basis for further research and modelling to more accurately predict how the Lake will respond, and predict the impacts on the Lake foreshore.

The Council has been actively preparing for climate change for the past few years. In 2007 it began to seriously consider its response to sea level rise through reviewing existing plans and information and undertaking studies on coastal and estuaries wetlands, effects of increased sea levels. This included conducting a community consultation on its flood risk management and waterway studies. In 2011 Council's actions for its sea level rise planning was recognised by NCCARF through its Climate Adaptation Champion program. The award recognised both planning and engagement aspects including:

Policy:

- Being one of the first Australia Local Governments to adopt a sea level rise policy and action plan (August 2008). The policy adopted a predicted rise of 0.91 metres by 2100, and incorporates this prediction in Council's risk and planning decisions
- Developing planning guidelines for foreshore areas affected by predicted sea level rises, placing restrictions in new development areas, and increasing requirements for floor levels and other structural adaptations in existing development areas

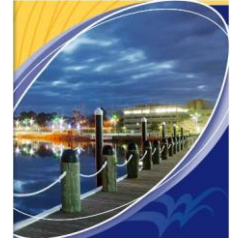
Community engagement:

- Engaging communities vulnerable to sea level rise (Dora Creek, Swansea, Belmont) in a community empowerment process to discuss and develop local climate change adaptation plans
- Partnering with Sydney University's Architecture Faculty to develop 2100 vision for adaptable urban design and building designs in communities vulnerable to sea level rise (2009 & 2010)
- Developing the *eShorance* web-tool to assist planners and residents to understand to potential impact of sea level rise on coastal estuaries (www.lakemac.com.au/eshoreance)
- Note that, despite constructive and proactive attempt to engage with the community, LMCC is experiencing a backlash from its some local developers and residents: in March and August 2012

there were public meetings to rally against LMCC's proposed planning guidelines and put pressure on Council to reconsider its inundation strategy.

11.2 Victoria: sea level rise plans of Wellington Shire Council

- **Wellington Shire Council developed a design framework used to engage the community around coastal development issues and because of the tension between responses to coastal vulnerability by State and Local Governments.**
- **A legacy of inappropriate coastal development in Central Gippsland has left a housing estate highly vulnerable to damage by coastal processes. The local Council was struggling to balance expectations of property owners, the broader community and other tiers of government.**
- **Source: Information summarised from Serrao-Neumann et al (2012)**
- **Useful resources: www.wellington.vic.gov.au – look for the *Coastal Towns Design Framework***



Wellington Shire Council is located in Central Gippsland at approximately 200 kilometres east of Melbourne. The Shire has coastal and lake areas which are vulnerable to flooding and inundation. These include the Ninety Mile Beach area identified by the DCC's First Pass Assessment (2009) to be one of the most vulnerable coastal areas in Australia.

Ninety Mile Beach is a 25 km strip of ocean foreshore which was developed in the 1950s and 1960s with housing estates, in particular an estate called The Honeysuckles. Since the 1970s authorities have attempted to address these estates' vulnerability to coastal hazards. Wellington Shire Council's response was through a subdivision strategy and also through the Coastal Towns Design Framework which was a joint initiative with East Gippsland Shire Council from 2004 - 2008.

Development of the design framework involved community consultation through community advisory groups and networks. This built on Council's public engagement initiatives underway since the late 1990s and was consistent with current efforts to improve public engagement. Implementation of the design framework meant that Council initiated a process to amend its planning scheme which involved further consultation and a review by an independent panel.

While climate change related impacts were clearly identified in the design framework, the consultation and hearing processes associated with the amendment of the planning scheme revealed the sensitivity surrounding the issue. In 2008 the release of a climate change study on impacts upon the Ninety Mile Beach area by ETHOS NRM Pty Ltd and Water Technology, and subsequently Council's intention to impose a ban on development through its coast subdivision strategy, triggered a strong reaction from the public. This was mainly due to the perception there would be a decrease in property values in the area.

The independent panel, however, recommended that the amendment for the planning scheme should clearly state that development in The Honeysuckles in particular should be 'consistent with any coastal hazards vulnerability assessment for the town'.

Furthermore, a planning regime was installed by the Council to enforce the preparation of a Climate Change Response Plan to be attached to property titles by landowners seeking further development in The Honeysuckles. Landowners appeared to be satisfied with this solution as it allowed them to continue to develop their land. However, since 2009 a moratorium on further development in The Honeysuckles has been imposed by the Victorian State Government. Yet at the local level there still persists a reluctance to specifically include climate change as an issue for The Honeysuckles.

While the current amendment submitted for approval by the State government identifies the issue of climate change, it does not incorporate coastal hazards specifically as recommended by the independent panel.

11.3 NSW: Gosford City Council planning for sea level rise

- **This case study highlights the issue of public apathy often faced by councils when they try to plan.**
- **Gosford Council found it difficult to make issues of coastal inundation salient to the community through its community forums until it began to formally advise property owners through S149 certificates.**
- **The Gosford area has a long history of flooding. Following the release of the NSW Draft Sea Level Rise Policy in 2009, Gosford Council developed and released publicly two sets of sea level rise maps to provide an initial indication of the areas that may be potentially impacted by increases in sea levels of up to 90cm.**
- **Source: Summarised from Serrao-Neumann et al (2012)**
- **Useful resources: www.gosford.nsw.gov.au/gis/slr**



The Gosford City Council area is identified as the third most vulnerable area to sea level rise in the State of New South Wales by the DCC First Pass assessment in 2009. Located 77 kilometres north of Sydney, Gosford has a population of over 16,000 people. Gosford's coastal zone includes approximately 140 kilometres of foreshore area, including Brisbane Water and Hawkesbury River, four major coastal lagoons and 14 kilometres of beaches.

The Council began to formally plan for sea level rise impacts in 2009 when it adopted the New South Wales State sea level rise planning benchmarks which suggests an increase in sea levels (above 1990 mean sea level) of 0.4m for 2050 and 0.9m for 2100 (Gosford City Council, 2009). In 2009 - 2010 Gosford City Council prepared a statutory development control plan (DCP125 – Coastal Frontage) which included a series of hazard maps and outlines development standards in coastal areas. This included two sets of sea level rise maps which provided an initial indication of areas potentially impacted by increased of sea levels. The hazard maps were publicly exhibited and made available through the Council website. A number of local forums to discuss the content of the maps were held in across the Local Government area. However, Council staff report that these forums struggled to attract more than a handful of people at each event. Despite trying to engage the community in discussion about the risk and potential strategies for sea level rise the Council struggled to gain traction on an issue not yet salient to the community.

These hazard maps were also used to encode properties through a notification on the planning certificate S149(5). In 2010 Gosford City Council began to advise property owners that they are potentially impacted by sea level rise of up to 90 cm by 2100 through planning certificate notifications and that this meant that development controls and strategies for sea level rise may arise for some areas. Despite there being little community interest in the hazard maps, once the notification began to appear on the planning certificates the community, and the local and national media, began to take notice. After protracted discussions this resulted in notifications being taken off s149 certificates in August 2012.

Council provides sea level rise and related planning information through a series of fact sheets, web pages and links on its web site. It also acknowledges in the information it provides that there are key knowledge gaps and high levels of scientific uncertainty. The Council has undertaken community consultation forums such as public meetings, workshops and community surveys related to its sea level rise planning processes. Such forums aim to provide residents with the opportunity to help shape the adaptation management options.

More recently Council is attempting to increase the detail of scientific knowledge for the local areas for urban and undeveloped areas through detailed planning processes for specific areas. It has also commissioned a detailed community consultation and engagement plan to guide its interactions with the community.

11.4 Tasmania: Climate change impacts on Clarence coastal areas

- **Clarence City Council in Tasmania has attempted a high level of community involvement in the planning for its vulnerable coastline.**
- **Source: Summarised from Serrao-Neumann et al (2012)**
- **Useful resources:** www.ccc.tas.gov.au/page.aspx?u=1630
- **www.ccc.tas.gov.au/webdata/resources/files/Attwater_-_Lauderdale_Scenario_Planning_Summary_Final_120308.pdf**



Clarence City is located to the east of Hobart, Tasmania. The Clarence City Council manages 191km of coastline. Much of the coastline is low lying and so vulnerable to sea level rise and inundation. The Clarence region has a history of coastal erosion and flooding which has triggered a number of previous investigations. DCC's first pass national assessment indicates that between 1,850 and 2,250 residential buildings in the area may be affected by sea level rise and storm tide inundation by 2100. Impacts are likely on coastal infrastructure such as salt water intrusion in sewage pipes along the coast.

In response to community concerns about erosion and flooding events in coastal areas and recognising the potential consequences of future sea level rise and storm surge events, the Clarence City Council initiated a project *Climate change impacts on Clarence coastal areas*. The purpose of the project was to assess the risk, risk perception and vulnerability of the city to climate change. Community consultation and dissemination of information was also a critical component of the project. A community survey and focus groups were conducted in the early phase of the project to analyse current knowledge, sentiments, opinion and attitudes regarding climate change impacts as well as identify factors for successful communication.

In total, two focus groups were conducted and a phone survey of 300 Clarence residents was undertaken in early 2007. Half of the residents surveyed lived in coastal areas and the other half were non-coastal. In addition, interviews were conducted with local businesses, government and community organisations. The findings from the survey indicated that residents are aware and concerned about climate change and sea level rise in particular. However, the responses also indicate that many residents have not translated this information into the impacts potentially affecting them, particularly amongst non-coastal residents. While most residents believed that climate change is real there were only a few sceptics who did not believe climate change was occurring. More than 80 percent of the residents interviewed strongly support the need to mitigate greenhouse gases, disseminate information, and introduce new planning controls to minimise flood risk. However, it was expressed that any measure that was considered being less favourable by community but necessary on behalf of Council needed to be well justified and communicated to the community to gain acceptance. In general, the survey indicated that the community trusts the Council and is supportive of the Council taking a proactive and lead role in the climate change debate.


In 2008, a comprehensive communication plan was developed to disseminate the information to relevant stakeholders. The communication plan included 'objectives, principles, target audiences and appropriate media for each, and detailed planning for the release of the report and an evaluation plan'. The plan was submitted and adopted by the Clarence City Council in June that year. Communication activities included a series of well attended public meetings, discussion in the media, direct mail of project material and meeting details to all residents. Residents also contacted the Council to obtain additional information as opposed to objecting to the proposed approach.

In 2012 the Clarence Council, as part of the Tasmanian Coastal Adaptation Decision Pathways (TCAP), is building on its previous work to develop medium to long term responses to climate change in Lauderdale area. Again this involves a high degree of community consultation and engagement including information evenings, scenarios workshops. To date the community has identified a series of pathways and potential options for further discussion.

12 Case studies from other countries


This section considers some international case studies however this is a rapidly growing list of communities who are taking innovative and effective approaches to community engagement over risks and hazards. More case studies are available in the EDO report prepared as Phase 2 of this project: *Audit of Sea Level Rise, Coastal Erosion and Inundation Legislation and Policy* available: www.sydneycostalcouncils.com.au/Project/Mapping_and_Responding_to_Coastal_Inundation

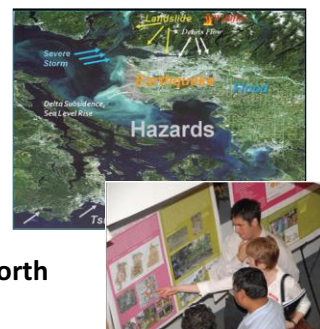
Table 9: Summary of international case studies

Location	Summary	Key resources
North Vancouver, Canada	<p>Winner of the 2011 United Nations Sasakawa Award for Disaster Risk Reduction.</p> <p>This case study is interesting because of the highly participatory nature of the risk and hazard planning.</p> <p>Located on steeply sloping terrain the District of North Vancouver is subject to extreme weather activity including heavy rainfall. A natural disaster in 2005 resulted in a new approach in managing natural hazards based on 'risk tolerance' and including high levels of transparency of hazard information and public engagement.</p>	<p>Source: This information is summarised from the District of North Vancouver's website: www.dnv.org</p> <p>The case for the United Nations Sasakawa Award for Disaster Risk Reduction www.unisdr.org/eng/sasakawa/index.php</p> <p>The District utilizes the CAN/CSA Q850-97 The risk management framework to manage natural hazards www.dnv.org/upload/documents/Engineering/CSAriskframework.pdf </p>
United Kingdom	<p>This case study presents scenarios of three potential responses to rising sea levels. The scenarios were developed by a diverse team which included many different professions.</p> <p>The scenarios are presented as a series of maps and this visual presentation should be highly effective in engaging a lay audience.</p>	<p>Source: This information is summarised from the resource: Building Futures/ICE (2010) Facing up to rising sea levels: Retreat? Defend? Attack? RIBA, London.</p>
Virginia Beach, USA	<p>This case study describes a project undertaken by academics, planners, NGO staff in Virginia Beach 2011 as part of a broader project on integrated coastal zone management.</p> <p>It involved a series of four facilitated public listening sessions around sea level rise which is a first for the state of Virginia and one of the few opportunities for public engagement on sea level rise that has occurred in the nation.</p>	<p>Source: Information on the broader project: www.virginia.edu/ien/sealevelrise</p> <p>The report on the listening sessions: www.virginia.edu/ien/sealevelrise/listeningessions.html</p>
Europe	<p>This case study includes a series of communication projects across Europe, coordinated from the UK, that are engaging with vulnerable coastal communities to look broadly at coastal change.</p>	<p>Source: CC2150 website: www.environment-agency.gov.uk/aboutus/wfo/128455.aspx</p>
New Zealand: Coastal Hazards and Climate Change: A Guidance Manual for Local Government in NZ	<p>New Zealand has a high level of vulnerability to sea level rise with most of its population living in coastal cities and towns. Governments at all levels are developing policies to account for sea level rise.</p> <p>A manual outlines decision making framework for addressing sea level rise in New Zealand. This involves a paradigm shift in the framing of coastal change and the engagement of the community</p> <p>The manual recommends that local authorities incorporate</p>	<p>Source: www.mfe.govt.nz/publications/climate/coastal-hazards-climate-change-guidance-manual</p>

sustainable integrated approaches that consider precautionary approach, [progressive risk reduction, and protect the coastal margin

12.1 Canada: Managing landslip risk in North Vancouver

- **Winner of the 2011 United Nations Sasakawa Award for Disaster Risk Reduction.**
- **This case study is interesting because of the highly participatory nature of the risk and hazard planning.**
- **Located on steeply sloping terrain the District of North Vancouver is subject to extreme weather activity including heavy rainfall. A natural disaster in 2005 resulted in a new approach in managing natural hazards based on 'risk tolerance' and including high levels of transparency of hazard information and public engagement.**
- **Source: This information has been summarised from the District of North Vancouver's website: www.dnv.org**
- **The case for the United Nations Sasakawa Award for Disaster Risk Reduction www.unisdr.org/eng/sasakawa/index.php**
- **The District utilizes the CAN/CSA Q850-97 risk management framework to manage natural hazards www.dnv.org/upload/documents/Engineering/CSAriskframework.pdf** 



The wet, coastal climate and mountainous terrain of the relatively affluent suburbs of North Vancouver have high vulnerability to landslide. In recent decades, increasing population growth in urban areas of the district had led to intense development of these hillsides placing people and property at risk.

The local authority – the District of North Vancouver (DNV) – overhauled their approach to managing natural hazards 2007 following a fatal landslide in Berkeley for which the local authority was held responsible by the community. The new approach by DNV is based on transparency of hazard information and high levels of public education and engagement and covers a wide range of natural hazards including landslides, debris flows, wildfires, flooding, storm surge and earthquakes. The program uses a risk-based approach in which risk tolerance criteria is applied to understand natural hazards and make decisions about reducing the risk to the public.

In developing the risk tolerance criteria, the District of North Vancouver engaged the community as well as engineering and geoscience professionals. Geotechnical engineering consultants developed a set of risk tolerance criteria in partnership with a task force comprised of volunteer community members. These criteria were compatible with the recommended approaches outlined by the Association of Professional Engineers and Geoscientists of BC (APEGBC) in their Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia. The risk tolerance criteria were formally adopted by the District of North Vancouver Council as policy in November 2009.

The District held community consultations-hosting public meetings, a public open house, and conducting a survey to gather information about the public's concern regarding types of natural hazards, their level of risk tolerance, residents' level of preparedness, and allocation of funds for hazards management.

Public education remains an important component of the program. The District still holds public meetings around matters related to natural hazard risk. It also devotes a significant part of its website to provide information about the different kinds of geohazard risk in the municipality

A notable feature of the District's Natural Hazards Management Program is its transparency. The District provides publicly available online maps that outline areas prone to natural hazards as well as areas where assessment studies have been completed. These reports are available on the District's website and are distributed to public libraries. The maps are continually updated, and new reports are posted as new information becomes available. This allows a prospective buyer to access reports on the property.

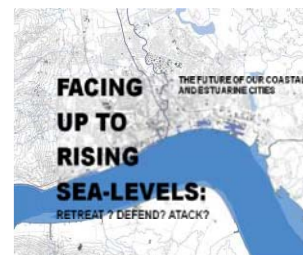
The District of North Vancouver received the prestigious United Nations Sasakawa Award for Disaster Risk Reduction. Nominated for the award by the Canadian National Platform for Disaster Risk Reduction and the Canadian Risk and Hazards Network, DNV is considered a visionary local authority as it is the first, and only community in Canada to meet the criteria for the designation of “Campaign City” as part of the international disaster risk reduction campaign, Making Cities Resilient – My City is Getting Ready. The District is recognized as a “Role Model City” for the United Nations Resilient Cities campaign.

12.2 United Kingdom: Facing up to rising sea levels

- **This case study presents scenarios of three potential responses to rising sea levels. The scenarios were developed by a diverse team which included many different professions.**
- **The scenarios are presented as a series of maps and this visual presentation should be highly effective in engaging a lay audience.**
- **Source of information: this case study was summarised from the resource:**

Building Futures/ICE (2010) Facing up to rising sea levels: Retreat? Defend? Attack? RIBA, London. Other resources

- **Download *Facing Up To Rising Sea Levels*: www.buildingfutures.org.uk/projects/building-futures/facing-up/facing-up-to-rising-sea-levels-pdf**



A consortium of British engineers and architects - Royal Institute of British Architects (RIBA), their think tank organisation Building Futures, and the Institution of Civil Engineers – have developed a resource to stimulate debate of options for the UK’s eroding coastline. Considering the climate change projections over the next century the project considers options for the built environment.

Outlining the pressing need for strategies the project outlines three broad solutions – “retreat, defend, and attack” with the idea that this will help the community to determine which approaches are suitable in which contexts. RIBA Building Futures and the Institution of Civil Engineers will explore the future decision-making processes on coastal management strategies. A story in three parts, the project uses the following definitions:

- **Retreat:** To retreat is to step back from the problem and avoid a potentially catastrophic blow. It is to move critical infrastructure and housing to safer ground and to allow the water into the city to alleviate flood risk. This is critically different from abandonment, as we propose a long-term planned and managed process.
- **Defend:** To defend is to ensure the sea water does not enter the existing built environment. This will require built defences to ensure the standard of protection will be met in the distant future as sea-levels rise. Although it is currently an expensive policy to adopt, can the defences themselves be designed in a way to make them economically and commercially viable?
- **Attack:** To attack is to advance and step seaward of the existing coastline. There is massive development potential for coastal cities by building out onto the water. This further reduces the need to sprawl into the countryside and ensures their sustained social and economic vitality. Although it leaves parts of the city still vulnerable to flooding, can the long term benefit of new development outweigh this risk?”

In July 2009, Building Futures and the Institution of Civil Engineers hosted a design charrette, bringing together a number of professionals from various relevant sectors. They had a select group of top architects, civil engineers, city designers, planners, developers, policy-makers, ecologists and futurologists. The brief was to produce both architectural and infrastructural responses to rising sea-levels on two case study cities; addressing the issue with our three proposed future scenarios – Retreat? Defend? Attack?

This work builds on previous projects into the challenges as a result of more frequent and serious flooding, 2007’s publication *Living with Water: Visions of a Flooded Future* the 2008 debate, *This House Believes the*

Thames Gateway Area is Sunk and the team has supported and advised on the RIBA's Climate Change Toolkit Document *Designing for Flood Risk*.

- Local government should not allow redevelopment in flooded areas

12.4 Europe: Coastal Communities 2150



- This case study includes a series of communication projects across Europe, coordinated from the UK, that aim to engage with vulnerable coastal communities to look broadly at coastal change.
- Source: CC2150 website
- Other resources CC2150 website contained project meeting minutes and while there is not much detail to date it is likely that it will eventually contain more detailed project material:
www.environment-agency.gov.uk/aboutus/wfo/128455.aspx

Coastal communities across Europe face the prospect of rising sea levels, higher storm surges and increased erosion, flooding and salinisation. Coastal changes will impact all areas of life and construction of ever-greater levels of traditional flood defences are not always a realistic option, either socially or environmentally.

Coastal Communities 2150 (CC2150) is a communication project to engage vulnerable communities who are at risk from coastal change. This aims to help communities to understand the long-term risks from a changing climate and shoreline. By looking at changes over a long-term timeframe, communities will be able to see a broad view of coastal changes, both positive and negative. This project will encourage local decision-making and allow communities to be open to developing their own responses.

The Project was launched in April 2011 and project partners have begun working together, producing a common 'Risk Profiling Framework' and stakeholder engagement analysis for each of their pilot areas. Examples of current best practice and case studies will be analysed to identify barriers to understanding and engagement and how they might be overcome. Partners are forming local engagement groups who will advise them on the development of new tools to explain the effects, risks and benefits of long term coastal climate change. Reports on best practice, stakeholder engagement and barriers to engagement will be published in early 2012.

Two international cross border workshops have taken place with a third to be held in December 2011. Representatives from Partner community engagement groups met in March 2012 to meet each other and begin developing project engagement tools.

12.5 New Zealand: a manual for managing coastal hazards

- **This case study presents a decision making framework for addressing sea level rise in New Zealand which involves a paradigm shift in the framing of coastal change and the engagement of the community.**

New Zealand is vulnerable to coastal change because a high, and increasing, proportion of urban development is located in vulnerable coastal areas. Coastal properties are increasing in value presenting an increasing challenge for planning authorities and governments.

The manual recommends “that local authorities incorporate the following principles into all aspects of their decision-making about coastal margins:

- **Precautionary approach:** A precautionary approach is adopted when making planning decisions relating to new development, and to changes to existing development within coastal margins. Decision-making takes account of the level of risk, utilises existing scientific knowledge and accounts for scientific uncertainties.
- **Progressive risk reduction:** New development is not exposed to, and does not increase the levels of, coastal hazard risks over their intended serviceable lifetime. Progressively, the levels of risk to existing development are reduced over time.
- **Coastal margin importance:** The dual role of natural coastal margins as the fundamental form of coastal defence and as an environmental, social and cultural resource is recognised in the decision-making processes and, consequently, natural coastal margins are secured and promoted.
- **Integrated, sustainable approach:** An integrated and sustainable approach to the management of development and coastal hazard risk is adopted, which contributes to the cultural, social and economic wellbeing of people and communities. “ (p10)

The manual also considers that to achieve these principles Local Government will need to “communicate effectively to build community awareness, and public and political support for activities associated with coastal hazard risk planning; and engage the community in consultation and participation in achieving effective community planning outcomes.” (p10).

Coastal erosion and inundation are framed as natural processes and vulnerability is due to urban development being located too close to the shoreline and therefore interfering with natural coastal processes. The new paradigm for management involves principles of consultation with communities and affected people: consultation is considered to require informed input into decision making through access to plain English information about sea level rise projections, risk assessment, and transparency of what is ‘certainty’ or ‘uncertainty’.

However despite its commitment to community participation this manual does not give much guidance to how this should occur.

Part VI Resources for communication

13 Resources for communicating climate change and sea level rise

The most up to date and comprehensive information on the current climate and potential for change is prepared by the Intergovernmental Panel for Climate Change (IPCC) and released approximately every four years (www.ipcc.ch). However this information is both too detailed, and yet not detailed enough, for the local level: that is, it offers a lot of technical detail but at a global scale. However it is considered the definitive reference on climate change projections.

Other guides provide the same credibility of descriptive information but in a more accessible format. There are also resources useful for communicating climate change and its impacts.

Less developed than climate change communication, there are few explicit resources for sea level rise science or communicating about coastal hazards. The resources summarised below represent the few that are current available. Table 10 provides science communication or media resources that can be used to explain sea level rise: councils might find it useful to provide links to these pages on their own websites.

Table 11 provides guides on communicating the science of climate change as well as the ‘how to’ of communicating climate change. They include comprehensive guides that outline the psychology of communication to current communication planning strategies used by local authorities.

Table 10: Media resources for explaining sea level rise

Source	Title	Resource Type	Description	Access at:
ABC Science Show	measuring and accounting for sea level rise	Transcript & audio	John Church from CSIRO explains how sea level rise is measured.	www.science.org.au/policy/climatechange.html
PBS video	Rising tide	Video	A simple sort video of how city of Norfolk, Virginia in the US is grappling with flooding caused by sea-level rise.	video.pbs.org/video/2227741130
Website	Skeptical science	webpage	This site aims to explain what peer reviewed science has to say about global warming	www.skepticalscience.com/sea-level-rise-predictions.htm
article	National Geographic	article	Ocean levels are getting higher – can we do anything about it?	ocean.nationalgeographic.com/ocean/critical-issues-sea-level-rise/

Table 11: Communication resources for climate change and sea level rise from technical sources

Topic	Title	Resource	Description	Useful for	Access at:
Climate change science	Science of Climate Change: Questions & Answers	Scientific publication for lay audience	This publication aims to address confusion created by contradictory information in the public domain. It sets out to explain the current situation in climate science, including where there is consensus in the scientific community and where uncertainties exist. The <i>Science of Climate Change: Questions and Answers</i> is considered highly credibility by the scientific community because of the scientific teams involved in preparation and oversight of this document.	Background information for staff Fact sheets for community Snippets for webpage	www.science.org.au/policy/climatechange.html
Climate Communication	Climate Communication	Simple science explanations	This US website outlines in simple terms and images what is happening to the global climate.	Background information	climatecommunication.org
US: Psychology of climate change communication (2009)	US: Psychology of climate change communication (2009)	Guide for communication & psychology of climate change	Intended for anyone who communicates about climate change, from scientists, journalists, educators, clerics, and political aides to concerned citizens, the guide's purpose is to assist reaching two key audiences—the general public and decision makers from government and businesses. The principles found in this guide can support climate change presentations and discussions	Helps in identifying communication messages and tactics	www.cred.columbia.edu/guide/
Communicating climate change	UK: Climate Change Communication Strategy: West Sussex	Strategy developed for a UK local authority	Developed by the UK Department for Communities and Local Government, this document aims to develop a more systematic and effective approach to communicating climate change in a Local Government areas in the UK. It draws on UK and European efforts in raising awareness of climate change. It uses large surveys of the UK population to address gaps in understanding and misunderstandings of climate change to improve communication	Good example of local authority's strategy for communicating climate change	www.espace-project.org/part1/publications/reading/WSCClimateCommunications%20Strategy.pdf
Sea level rise management & adaptation tools	New Zealand: Coastal hazards & climate change: a guidance manual for Local Government	Online manual developed for local authorities	This guidance manual is intended to help local authorities manage coastal hazards by: providing information on the effects of climate change on coastal hazards; presenting a decision-making framework to assess the associated risks; and providing guidance on appropriate response options.	Good example of a NZ authority's strategy of preparing for coastal hazards	www.mfe.govt.nz/publications/climate/coastal-hazards-climate-change-guidance-manual/
United States: Adaptation tool kit: sea-level rise and coastal land use	United States: Adaptation tool kit: sea-level rise and coastal land use	Land use planning toolkit for use by US local and state government	This toolkit outlines practical land use planning measures for use by local and state governments (in isolation or working together) in the US to help adapt to sea-level rise in a prudent and balanced manner. It describes US legal, planning and management devices that can reduce future vulnerability. It recognizes that not all tools are available or suitable for all communities, and so anticipates and supports choice of approaches by each local and state government.	Includes practical information for the US context that could be adapted for NSW	www.georgetownclimate.org/resources/adaptation-tool-kit-sea-level-rise-and-coastal-land-use

Topic	Title	Resource	Description	Useful for	Access at:
			Outlining four different types of response including planning tools, regulatory tools, spending tools and tax /market based tools, the kit analyses benefits and costs of each as well as examples of use.		
	United States:	Online toolkit and resource guide	This online resource is a very useful repository of tools and information for communicating sea level rise for a US audience. However many of the principles and resources are useful for other contexts. It highlights the five step process of 'Understand, identify, visualise, communicate, discover'.	US context but can be adapted for NSW	www.csc.noaa.gov/digitalcoast/inundation/communicate
	Australia	State of the Climate 2012	This State of the Climate is the second paper produced by CSIRO and the Australian Bureau of Meteorology. It provides a summary of observations of Australia's climate and analysis of the factors that influence it.	Current Australian observations	www.csiro.au/en/Outcomes/Climate/Understanding/State-of-the-Climate-2012/Oceans.aspx
		CSIRO	A collection of current sea level rise science publications – including some relatively simple explanations	Science explanations	www.cmar.csiro.au/seal
	Victoria	Victorian Government	A fact sheet to explain sea level rise and its impact for Victoria's coastline in simple terms	Simple explanation	www.climatechange.vic.gov.au/___data/assets/pdf_file/0006/124935/Sea-Level-Rise-Factsheet.pdf

Part VII Stakeholder analysis

An important part of communication planning and planning for community engagement is identifying, analysing and prioritising stakeholders and then identifying the most appropriate ways you can engage with them. There are a number of ways for Councils to consider which groups and individuals they need to engage in communicating about coastal change and risk. For example, stakeholders could be categorised by level of physical exposure to inundation, level of social or economic vulnerability, or level of concern about the planning process.

Councils should spend time brainstorming their local stakeholders, how they can be grouped and what are the most effective approaches in their local area. An efficient way of structuring this brainstorming information is through a 'plan on a page' outlined below.

14 Stakeholder 'plan on a page'

These are provided as a guide so you can start thinking about your local stakeholders and context.

Stakeholder: Councillors/elected representatives

Council's goals	Council elected representatives understand the need to take action on erosion, inundation, sea level rise
	Council elected representatives understand the rationale and process for community engagement around these issues
	Council considers climate change, SLR and community when making decisions (also another one about legal ramifications for acting and not acting)
	Council is aware of legal implications of acting or not acting on climate change
Stakeholder concerns	Changes to the status quo will be unpopular electorally – backlash from community
	Climate change is not proven/certain
	Why should Council take action when others don't? Are we/should we act in isolation?
Key messages	Council presents a united front on these issues and decisions
	Council has a duty of care to do something – community expectations, litigation , duty of care, responsible government, acting on current science, assisting to ensure good investment
	There are risks in doing nothing

Tactic	Delivery (when, how)	Who	Measured by
Information sessions for councillors to discuss hazard maps, communication strategies around maps	Organise for meeting for councillors invite experts where needed (local where possible)	Community engagement & planners, hazard managers	feedback from councillors
Provide councillors with community information	Deliver at Council meeting	Community engagement & planners	feedback from councillors

Stakeholder: Council staff

Council's goals	Council staff understand the need to take action on erosion, inundation, sea level rise
	Council staff understand the rationale and process for community engagement around these issues
	Council considers climate change, SLR when making decisions (again maybe mention legal (and maybe community trust / moral issues as above)
	Council considers legal issues and 'duty of care' related issues in decisions about sea level rise
Stakeholder concerns	Climate science is not proven/certain
	What are the local impacts
	Insufficient information or resources to act
Key messages	Council needs to present a united front on these issues and decisions
	Council has a duty of care to do something – community expectations, litigation
	Council has a duty under State legislation and other State guidelines (OEH, Dept Planning)
	There are risks in doing nothing (e.g. Local Government Act (section 733)
	This is what Council is going to do around this issue OR this is the process Council is going to put in place to work out how best to manage this issue

Tactic	Delivery (when, how)	Who	Measured by
Information session for general staff	As part of Council processes	Elected representatives with support from staff & planners, hazard managers	Feedback from staff – use feedback to refine other communication material

Stakeholder: Existing property owners – segment these by level of risk of inundation to property

Council's goals	Existing property owners are aware of responsibilities for their property as well as Council's role responsibilities
	Council's position is regarded as defensible – legally and morally
Stakeholder concerns	Will the value of my property be affected
	Will I be able to develop my property
	Why is Council doing this? Can I have a say?
	How is Council doing this? Do they have the right to do this?
	Will the beach be affected?
	Why can we do what we have done in the past
	What alternatives (within limits) has Council investigated?
Key messages	Council is acting responsibly and legally – in line with national guidelines (Building Code of Australia) and State guidelines and policies
	Council has investigated this using the best available scientific knowledge
	Residents have local knowledge to contribute and have opportunity for input
	Council wants to work in partnership with residents to ensure the best outcome for all
	Decisions made now affect the sustainability of our coasts in the future
	We need to act now to protect our coast

Tactic	Delivery (when, how)	Who	Measured by
Council makes hazard maps available with supporting information	Letter to existing property owners re rationale how/where maps can be viewed	Community engagement & planners	Stakeholder feedback
Meetings by locality – aim for 'small groups in safe environment'	Invitation by areas – most affected, moderately affected, least affected	Community engagement & planners	Stakeholder feedback
Local knowledge project	Project to canvas local knowledge: historical, events, solutions, photos	Community engagement	No of responses useful for staff and project improvement
Fact sheet for existing owners , coastal processes: erosion, inundation & SLR	Posted out & available on website	Community engagement & planners	Pre-test with focus group

Stakeholder: Potential property owners

Council's goals	Potential property owners are aware of their rights and responsibilities for their property as well as Council's rights and responsibilities
	Potential property owners get good advice during purchasing process
	Council's position is regarded as defensible – legally (EP&A Act – 149 certificates etc) and morally
Stakeholder concerns	What are the potential risks in purchasing this property
	Will the value of my property be affected in the future
	Will I be able to develop my property in the future
Key messages	Council is acting responsibly and legally.
	Council has investigated this using the best available mix of scientific and local knowledge
	Council is a responsible manager of the coast (in partnership with State Government)
	Council wants to work in partnership with residents to ensure the best outcome for all
	Other Councils are also developing similar coastal management plans, policies etc.
	Decisions made now affect the sustainability of our coasts in the future
	We need to act now to protect our coast

Tactic	Delivery (when, how)	Who	Measured by
Fact sheet for potential residents that explains council policies and options for residents in coastal areas.	On web site Available through real estate and conveyance industry	Community engagement staff & planners Get ideas from customer service staff (e.g. reception or counter staff)	Stakeholder feedback Number of views of maps (e.g. print run, hits to web)
Council makes hazard maps available with supporting information	On website	Planning Elected representatives	Stakeholder feedback

Stakeholder: local business and industry

Council's goals	Local businesses who will be highly affected are aware of their rights and responsibilities for their property and business as well as Council's rights and responsibilities
	Local businesses who are indirectly affected are aware of issues of access or supply
	Council's position is regarded as defensible – legally and morally
Stakeholder concerns	Highly affected businesses (affected through location e.g. recreation clubs, tourist operators) will be concerned about their premises and businesses
	Indirectly affected business would be concerned about broader issues such as a loss of trade if coastal area access or attractiveness is diminished
	Concerns about changes in land use or to economic viability of business
Key messages	Council is acting responsibly and legally
	Council has investigated this using the best available scientific knowledge
	Residents have local knowledge to contribute also
	Council wants to work in partnership with residents to ensure the best outcome for all
	Decisions made now affect the sustainability of our coasts in the future
	We need to act now to protect our coast
	Residents have opportunities for input (outline depending on the Council)

Tactic	Delivery (when, how)	Who	Measured by
Work with chamber of commerce to identify affected businesses and engage them in sharing local knowledge. Also with individuals and small businesses most affected	Shared knowledge of impacts and responses	Community engagement & planners	Level of engagement of businesses.
Highly affected business would need tailored information session	tailored discussion session in business sectors or interest groups	Community engagement & planners Hazard managers, Elected representatives	How many people attend and then follow up in some way (given that capacity for involvement will vary)
Indirectly affected businesses	Organise chamber of commerce	Community engagement & planners	

Stakeholder: Property industry (major landholders, realtors, developers, solicitors, architects)

Council's goals	Potential property owners are aware of their rights and responsibilities for their property as well as Council's rights and responsibilities
	Potential property owners get good advice during purchasing process
	Council's position is regarded as defensible – legally and morally but also in the eyes of the broader community
Stakeholder concerns	Will the value of properties be affected in the future?
	What are the legal, insurance and finance implications?
Key messages	Council is acting responsibly and legally.
	Council has investigated this using the best available mix of scientific and local knowledge
	Council is a responsible manager of the coast
	Council wants to work in partnership with residents to ensure the best outcome for all
	Decisions made now affect the sustainability of our coasts in the future
	We need to act now to protect our coast

Tactic	Delivery (when, how)	Who	Measured by
Fact sheets for different stakeholders of property industry	On website, available through realtor officers	Community engagement & planners	Stakeholder feedback
Meetings with property industry Meetings with major land owners	Information events by invitation – ensure there is a process to elicit industry knowledge around coastal property	Community engagement & planners Elected representatives	Stakeholder feedback
Council makes hazard maps available with supporting information	On website	Planning staff	Stakeholder feedback

Stakeholder: Emergency services

Council's goals	Council and emergency services have a clear understanding of roles and responsibilities for preparedness and action
	Council and emergency services staff have clear communication channels and opportunities for knowledge sharing
Stakeholder concerns	Roles and responsibilities during emergency event (NB: while who has the power to act should be clear through legislation it has been found to be unclear at implementation i.e. during a disaster)
	Link with activities of other emergency service providers
Key messages	Effective implementation at time of 'crisis'
	Existing plans may not be sufficient in light of new hazard information so need to be reviewed locally with relevant stakeholders
	Supporting community to prepare for new scale hazards is necessary

Tactic	Delivery (when, how)	Who	Measured by
Review existing local emergency planning procedures (e.g. DISPLANS) in light of new hazard information. Develop and workshop scenarios and responses	Workshops with local government and emergency staff. Plans available on council and emergency services website. Plans shared across regional scale.	Council emergency staff, engineers and staff from other emergency agency	Plans developed and trialled
Support /lobby for integration of these plans at regional/broader scale.	Through council channels to influence state government	Council CEO and senior staff	Effective regional arrangements developed tested and understood.

Part VIII Bringing it together

15 Developing a communication & engagement strategy

Once the Council has determined its level of exposure to the risk of sea level rise it is necessary to develop a communication and engagement strategy. The simplicity or complexity of the strategy would depend on the level of exposure: will inundation have a small or transformative impact on residents, business, industry and other stakeholders?

Communication by local Councils about sea level rise - or other contentious policy issues - requires carefully planned strategic communication that engages broadly across the community.

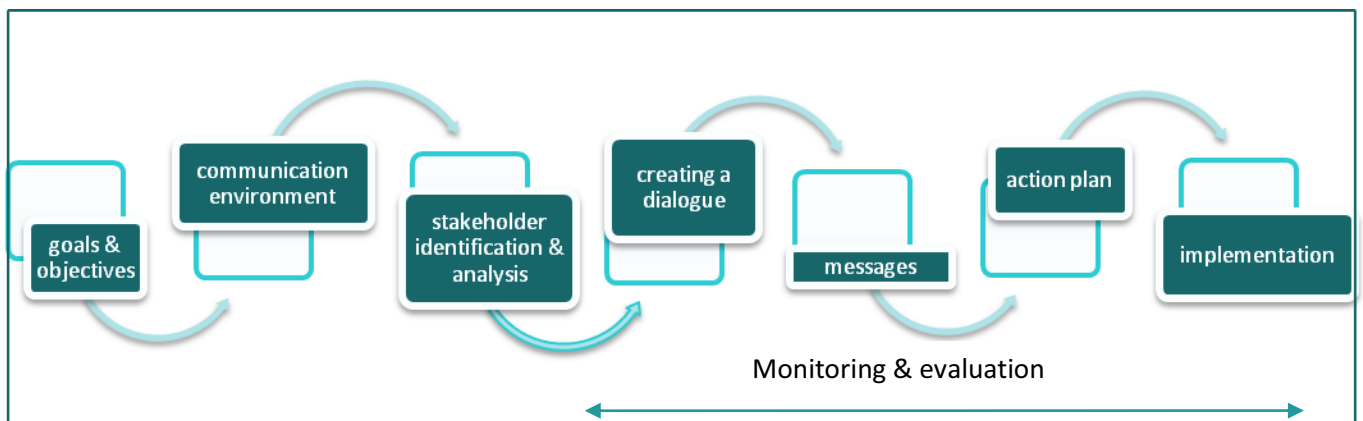
Council can use both the IAP2 framework and the risk communication framework of 'crisis, care and consensus' to think through how they structure their communication around coastal inundation which requires both short and long term communication processes. They can capture this thinking through a communication and engagement strategy.

An effective communication strategy means that Council is able to develop consistent and transparent goals for engagement, allocate and prioritise resources, and evaluate and learn from activities. It also means that stakeholders are involved in a systematic way. At the same time Council is communicating with, and learning about, a broad section of the community and can modify what they do in response to the gathered information and learning

A communication and engagement strategy is the written document that outlines and details the communication objectives, needs and processes for a particular issue or project. It can be a simple or complex document depending on the complexity of the project.

A variety of information contributes to a comprehensive communication and engagement strategy and your Council may have an existing template (e.g. Pittwater Council). Figure 4 shows the elements of a communication and engagement strategy. The strategy, although represented as one way here, is iterative and repeats with re-clarifying goals and checking the changing communication and learning environment. Some steps are done in sequence or concurrently.

Figure 3: Elements of a communication and engagement strategy



15.1 Identify Council’s communication goals and objectives in engagement with the community

Communication goals tend to be big picture. Consider the risk framework – is this a care, consensus or crisis communication goal? Depending of which type of goal will help you decide on the rest of the steps of the communication and engagement strategy.

Does achieving the goal require the community to be informed, consulted, involved, collaborated, or engaged? What are the communication objectives that will help you achieve the goal? Communication objectives should be measurable so Councils can use them to judge their progress.

15.2 Consider the communication environment

This step involves considering what is the local context for your communication. For example, what is currently happening in the broader landscape of your community and also around this issue that might affect how your communication efforts are perceived? What are the things your community cares about?

See Part III to consider what might affect the communication environment for your Council

See Part V: A case study about Northern Vancouver outlines how risk planning was brought on by a fatal landslide

What is the type of risk framework: is this crisis, care or consensus communication? (Part IV: risk communication frameworks and IAP2 engagement framework)

How does that help you balance types of information required (expert, local knowledge) and information flow (one-way, two-way) (see Table 4 which outlines different types of information required under different circumstances)

IAP2 framework: what level of community participation is required? (See Table 4 for a description and Table 5 for a Council example).

15.3 Identify and analyse the stakeholders

Who are the important groups and individuals that need to be involved in the communication processes to achieve the goal? What are the community values? What do they know/ think/ care about this topic already? What are the characteristics of these stakeholders? What is the best way to communicate with these stakeholders? What might help them to think about this? What might help them get involved or change their behaviour?

Also important is to understand your own Council to consider how the current staff and elected representatives perceive the issues. Also what is the existing relationship between you Council and the community - how will the community perceive potential communication on this issue?

See Section VII for sample stakeholder ‘plan on a page’ which can help you think about specific stakeholders and what might be most effective communication tactics

See Part V case studies.

15.3.1 UNDERSTAND YOUR COUNCIL

Councils as organisations vary enormously. Some Councils are highly conservative and risk averse; others are more willing to innovate and try new things. Similarly the relationship between Councils and their community varies enormously. What is the community perception of your Council? How well are you

already communicating and engaging with your residents? What is working: and what isn't? How will the character of your Council affect how you can communicate? Do you have to do a lot of work internally as well as externally?

Most Councils already have ways of gaining feedback from their community to understand how they are perceived. Consider feedback through community surveys, media coverage, and counter staff. Use the available information (e.g. resident surveys, community feedback) to consider what residents think of your organisation and how this may affect any communication from Council or how people will approach engagement efforts.

Also ensure that education and training has been provided for councillors and staff. Ensure that front line staff, in particular, are equipped to support the process with sufficient information.

15.3.2 UNDERSTAND YOUR COMMUNITY

Consider what is the composition of your community? How will the broad composition of your community affect your communication? Are there any strong community patterns that will affect your ability to engage with them? Are people strongly conservative, strongly green, mostly single parents, elderly, have challenging work habits such as long commutes to jobs elsewhere?

See Part III Section 7: Community perceptions

See Part IV Section 11: Tools for community engagement.

One interesting stakeholder analysis process: Like many Councils, Leichhardt City Council uses a lot of Australian Bureau of Statistics tools to better understand their audience – www.leichhardt.nsw.gov.au/Community-Profile.html

15.3.3 COASTAL STAKEHOLDERS

Consider who are the important stakeholders in your community for this issue? Suggested stakeholders include community and business groups and individuals that use the coast in some way. In most places that means just about everyone will have an opinion!

How have you communicated with these groups in the past? What has worked? What hasn't worked? What existing communication channels does Council have – or does the group have – that you can use to engage with particular groups?

See Section VII: Stakeholders 'plan on a page'

15.4 Creating a dialogue

Given your objective and the stakeholders identify what are the most appropriate tactics or channels to use to engage these stakeholders. You might need to think creatively and be flexible to engage broadly as it is difficult for some groups to get involved.

See Part IV: Table 3: Risk communication framework

See Part IV: Table 4 Tools for engagement

See Appendix: Stakeholders on a page

15.5 Messages

List the main ideas and messages council needs to discuss with their stakeholders as part of the engagement activities.

Think about how to explain council's position in simple terms that avoid council jargon or acronyms. Make sure you trial difficult explanations with sample audiences to be sure they are understood in the intended way.

For complex concepts, like sea level rise, that have been widely debated in the media there are a range of perceptions and misconceptions held by the community. Therefore it is useful to think about what these might be.

What do your stakeholders already know?

What is it useful for stakeholders to know to be able to engage in productive discussions?

What could they misunderstand?

See Section IV: Table 3: Risk communication framework

See Part VI: Resources for communicating sea level rise - e.g. Table 7 and 8

See Section VII: Stakeholders 'plan on a page'

Consider the 'broader messages as well as simple explanations of scientific, technical, planning terms. Look for different ways of communicating technical information using some new media like podcasts, vodcasts, links to websites that have useful graphics etc.

Remember people will ignore or react adversely to a message if the source isn't trusted or the message isn't perceived as relevant.

15.6 Monitoring and evaluation

It is important – both for short term effectiveness of activities and longer term progress towards meeting your goals – to identify how you can monitor activities and evaluate overall progress towards goals.

Suggestions for monitoring include monitoring each activity undertaken (see Part IV on communication and engagement tools and the IAP2 framework: both these sections provide suggestions for monitoring). There should also be broader monitoring of broader progress towards engagement goals through existing council monitoring strategies such as community feedback via frontline staff, community surveys, media monitoring of coastal issues.

Research shows that feedback from community consultation activities commonly includes disappointment, frustrations and cynicism about the lack of post consultation feedback. Respondents described community consultation as a 'black hole' – they provide ideas and energy with little return in terms of feedback on how the information is used or decisions made.

15.7 Implementation

Use the above six steps to develop an implementation plan so you can identify what needs to be done and how you can allocate resources and responsibilities. In Table 12 we present a sample implementation plan to provide an example of two potential goals for your Council.

Table 12: Sample implementation or action plan

Goal	Stakeholders	Media/ Tool	Action	Responsibility / timing/ resources	Evaluation metric
To increase awareness in the general community of the implications of climate change for coastal areas so that these become a factor in their future plans	Councillors and Council staff	Briefing	Planning, engineering, community engagement staff present Council information and approach (including hazard maps)	Council staff Maps, fact sheets	Councillors and Council staff indicate they understand broad concepts and Council's approach
	All stakeholder groups	Website Fact sheets Support front line staff to respond	Develop general communication background material on sea level rise and Council response to distribute through general channels. Specific information will be presented through	Communication consultant engaged to develop technical material Council staff tailor this for their use	Communication material tested with community reference group
To consult with the community to stimulate practical, creative and constructive responses that recognise and respond to risks without loss of the amenity, use and enjoyment of coastal	Existing property owners	Meetings by locality/ risk Fact sheets and background	Segment affected residents by risk Planning staff invite groups of affected residents beginning with least affected, to information sessions	Planning and community engagement staff work to prepared background information including letter; Residents segmented by risk level; Meetings organised	Feedback from residents used to inform and improve meetings and information
	Coastal organisations	Design charrettes or public listening sessions Local knowledge project	Work with coastal groups to capture coastal values from past and future and also any creative ideas e.g. develop set of risk tolerance criteria	Community engagement staff to design with planning staff – also engage historical groups	Indicated by level of engagement and continuity in the projects
	Business/industry	Meetings by locality/ risk			

15.8 Summary

Developing a communication and engagement strategy should be a collaborative process between the communication specialist (who may be a staff member or external consultant) and the staff who will be responsible for undertaking most of all of the activities.

The communication and engagement strategy should be a working document rather than a finalised plan that sits on a shelf. It needs to be an iterative learning process that Council uses to guide and reflect on its activities. Each Council's strategy is likely to be quite different.

References

- Abel, N., Gorddard, R., Harman, B. Leitch, A.M., Langridge, J. Ryan, A. and Heyenga, S. 2011. Sea level rise, coastal development and planned retreat: analytical framework, governance principles and an Australian case study. *Environmental Science & Policy* 14:279-288.
- Anderegg, W. R. L., J. W. Prall, J. Harold, and S. H. Schneider. 2010. Expert credibility in climate change. *Proceedings of the National Academy of Sciences* 107:12107-12109.
- Beatley, T. 2009. Planning for coastal resilience: best practice for calamitous times. Island Press, Washington, USA.
- Bell, H. M. and G. A. Tobin. 2007. Efficient and effective? The 100-year flood in the communication and perception of flood risk. *Environmental Hazards* 7:302-311.
- Church, J.A., Hunter, J.R., McInnes, K.L. and White, N. 2006. Sea level rise around the Australian coastline and the changing frequency of extreme events. *Australian Meteorological Magazine* 55: 253-260.
- Climate Risk (2011) Climate change risk, adaptation and evolution in local government. Practical insights from the Local Government Adaptation Pathways Project. Report prepared for DCCEE, Canberra.
- CSIRO-BoM (2012) State of the Climate. At www.csiro.au/Outcomes/Climate/Understanding/State-of-the-Climate-2012.
- Department of Climate Change. 2009. National Coastal Risk Assessment. Available at: www.climatechange.gov.au/government/initiatives/australias-coasts-and-climate-change/adapting/national-coastal-risk-assessment.aspx
- Diethelm, P. and McKee M. 2009. Denialism: what is it and how should scientists respond? *The European Journal of Public Health* 19:2-4.
- Doran, P. T. and Zimmerman M. K. 2009. Examining the scientific consensus on climate change. *Eos Trans. AGU* 90:22.
- Environmental Defenders' Office. 2011. Audit of Sea Level Rise, Coastal Erosion and Inundation Legislation and Policy. Report by the Environmental Defender's Office, New South Wales for the Sydney Coastal Councils Group, NSW. Available from www.sydneycostalcouncils.com.au/Project/Mapping_and_Responding_to_Coastal_Inundation
- Gilmour, J., Beilin, R. and Sysak, T. 2011. Biosecurity risk and peri-urban landholders: using a stakeholder consultative approach to build a risk communication strategy. *Journal of Risk Research* 14:281 - 295.
- Godber, A., P. Hastings, and I. R. W. Childs. 2006. Local government views on addressing flood risk management on the Gold Coast. *The Australian Journal of Emergency Management* 21:34 - 40.
- Herriman, J. 2011. Local Government and Community Engagement in Australia. Working Paper No 5. Australian Centre of Excellence for Local Government, University of Technology Sydney.
- IPCC 2007: Solomon S., Qin D., Manning M., Chen Z., Marquis M., Averyt K.B., Tignor M. and Miller H.L. (eds.) 2007 *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, London.
- Leitch A.M. 2010. The role of local media in forming and shaping public opinion on controversial issues: a Byron Shire example. Australian Coastal Council Conference. *National Sea Change Task Force. March 2010, Byron Bay, NSW.*
- Leitch, A. M. and Robinson C. J. 2012 Shifting sands: uncertainty and a local community response to sea level rise policy in Australia. In T. G. Measham and S. Lockie, editors. *Risk and Social Theory in Environmental Management*. CSIRO Publishing, Melbourne.

- Leviston, Z. and I. A. Walker. 2010. Baseline Survey of Australian Attitudes to Climate Change: Interim Report. CSIRO, Perth, Western Australia.
- Leviston, Z. and I. A. Walker. 2011. Second Annual Survey of Australian Attitudes to Climate Change: Interim Report. CSIRO, Perth, Western Australia.
- Leviston, Z., Leitch, A., Greenhill, M., Leonard, R., & Walker, I. (2011). Australians' views of climate change. CSIRO Report. Canberra. www.garnautreview.org.au/update-2011/commissioned-work/australians-view-of-climate-change.htm
- Lord, D. and Gordon, A.. 2011. Local government adapting to climate change - where the rubber hits the road. *Coasts and Ports 2011 Conference*, Perth.
- Lundgren, R. and McMakin, A. (2009). Risk Communication: A Handbook for Communicating Environmental, Safety and Health Risks. Wiley-IEEE Press.
- Morrison, C. and Walmsley, R. (2010) *Is the law a useful communication tool in a changing climate?* NSW Coastal Conference, Bateman's Bay November 2010.
- NSW Government (1990) Coastline Management Manual. Available at www.environment.gov.au/archive/coasts/publications/nswmanual/index.html
- NSW Government (2009) Who cares about the environment in 2009? Department of Environment Climate Change and Water. Sydney.
- NSW State Emergency Management Act (1989). At www.austlii.edu.au/au/legis/nsw/consol_act/searma1989331/
- NSW Government (2009) Derivation of the NSW Government sea level rise planning benchmarks: Technical Note. At www.environment.nsw.gov.au/resources/climatechange/09709technotesealevelrise.pdf
- Ryan, A., Gorddard, R., Abel, N. Leitch, A.M., Alexander, K. and Wise, R. 2012. Perceptions of sea level rise risk and the assessment of managed retreat policy: results from an exploratory community survey in Australia. CSIRO: Climate Adaptation National Research Flagship.
- Walsh, A. 2012. Waterfront land losing value in Ballina. *Property Observer*. 5 March 2012. www.propertyobserver.com.au/residential/waterfront-land-losing-value-in-ballina/2012030453596
- Zhang, Y. 2010. Residential housing choice in a multihazard environment: implications for natural hazards mitigation and community environmental justice. *Journal of Planning Education and Research* 30:117-131.

CONTACT US

t 1300 363 400
+61 3 9545 2176
e enquiries@csiro.au
w www.csiro.au

YOUR CSIRO

Australia is founding its future on science and innovation. Its national science agency, CSIRO, is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation.

FOR FURTHER INFORMATION

Climate Adaptation Flagship

Anne M Leitch
t +61 7 3833 5652
e Anne.Leitch@csiro.au
w www.csiro.au

Matthew Inman
t +61 2 9490 5499
e Matthew.Inman@csiro.au
w www.csiro.au/

Sydney Coastal Councils Group

Geoff Withycombe
t +61 2 9246 7791
e Geoff@sydneycoastalcouncils.com.au
w www.sydneycoastalcouncils.com.au