Gingin Dandaragan Coastal Hazard Risk Management Workshop

Summary Report

January 2014




Coastal Focus

This document was prepared for the Northern Agricultural Catchments Council, the Shire of Gingin and the Shire of Dandaragan, by Coastal Focus.

Disclaimer:

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Executive Summary

The coastal zone is a dynamic environment that presents a complex challenge for institutions involved in its management. Appropriate short and long term actions need to be established for the effective management of the coastal zone in the face of changing coastal processes, such as rising sea levels, in order to preserve the wide range of assets (and values) that are bound to be impacted. A range of policies and guidelines exist to support local governments to assess risks from changing coastal processes and to identify strategies for managing these in consultation with the community. Local governments (and proponents) are now encouraged to follow the *Coastal Hazard Risk Management and Adaptation Planning* (CHRMAP) process to assess risks to coastal assets and identify appropriate risk mitigation options (WAPC 2013). The CHRMAP is a standardised process developed for dealing with risk in the coastal zone recommended in the *State Planning Policy 2.6 State Coastal Planning Policy* (WAPC 2013).

In recognition of this, the Shire of Dandaragan, Shire of Gingin and the Northern Agricultural Catchments Council (NACC) are in the process of formalising a partnership to collaboratively prepare and adapt to the future impacts of coastal processes and hazards along the *Hill Primary Coastal Compartment*.

The Gingin and Dandaragan partnership recognises the benefits of integrated approaches to coastal planning and management as outlined in the *National Cooperative Approach to Integrated Coastal Zone Management - Framework and Implementation Plan* (Department of Environment and Heritage 2006). Such partnerships are an effective way of maximising limited resources, developing networks across large stretches of coastline, sharing and increasing knowledge between a range of stakeholders, developing consistent policies for landholders and developers, and ultimately ensuring the integration of science and best available information into coastal planning and management responses to coastal recession and inundation.

The first step of the Gingin Dandaragan process was to commission a data and information gap analysis for the study area. The *Hill Primary Coastal Compartment Information & Data Gap Analysis Report* (Danese 2013) was completed in July 2013 and a summary of its recommendations is included in Appendix G of this document. This phase also included a workshop to share the findings of the gap analysis with a number of stakeholder and community representatives. The Gingin-Dandaragan Coastal Hazard and Risk Assessment Workshop was held at Ledge Point on 17 June 2013.

The aim of the workshop was to bring together representatives from a range of organisations and community groups to discuss the risks that coastal communities face as a result of sea level increases, warming ocean temperatures, and other coastal processes. The workshop also discussed approaches for managing and adapting to these risks.

The workshop discussed:

- coastal hazard risk assessments as tools for reducing risk to coastal assets
- coastal processes and hazards affecting the Hill Primary Coastal Compartment
- required next steps for the Hill Primary Coastal Compartment
- methods for strengthening multi-agency partnerships; and
- potential networks and resources available for supporting next steps.

The recommendations in this Document, if implemented, will help the two Shires form a governance and communication framework that will support the implementation of recommendations made in the *Data and Information Gap Analysis* for undertaking coastal hazard risk management and adaptation planning across the Hill Primary Coastal Compartment.

Funding for this workshop was provided by Caring for Our Country through the NACC. Community feedback was recorded on forms and distributed at the end of the workshop. A total of 38 participants attended the workshop. Participation was by invitation (see Appendix D for the list of attendees).

The workshop was divided into eight sessions (Appendix E). Each session began with a presentation followed by questions from the floor. The presenter responded to questions supported by a representation of specialists in coastal processes, coastal adaptation and planning and coastal engineering. **Session I** was a presentation on the CHRMAP and its applications at the regional level. **Session II** was a presentation on coastal assets that could be at threat from hazards and what value these assets provide to the community. **Session III** was a presentation on coastal hazards and processes relevant to the Hill Primary Coastal Compartment. An open room discussion followed. **Session IV** provided information about the key data sets necessary for understanding coastal processes at the local and regional scale. **Session V** aimed to inform participants about the availability of funding opportunities and technical support for data collection and hazard management through the Department of Transport. **Session VI** was a presentation on planning requirements and legal implications for local governments. **Session VII** aimed to identify ways to effectively inform internal staff, Councillors and the community throughout the CHRMAP process. **Session VIII** provided information regarding options for managing immediate coastal hazards of erosion and inundation.

Key concerns raised at the workshop included**:**

- immediate coastal risk and how this project will help address these challenges
- accuracy of modelling and coastal data sets
- who is responsible for undertaking CHRMAP
- impacts of off-road vehicles and urban development along already vulnerable coastal areas; and
- Liability of Councillors and councils.

Table 1 summarises the recommendations and steps to move the project and partnership forward based on the author's experience in CHRMAP projects and her case study PhD research findings.

Table 1: Recommendations and Key Steps

1.	Identify lead officer(s) in each local government and partner organisations to provide the necessary internal follow up.
2.	Disseminate the gap analysis and workshop summary reports internally to key staff and elective members via presentations.
3.	Each local government to explore how the outcomes of the CHRMAP are likely to be incorporated into strategic and statutory planning, environmental and engineering strategies, policies and plans, including coastal management plans. This should be undertaken prior to the formalization of the partnership (step 4).
4.	Joint meetings to: ▪ Formalise a collaborative partnership ▪ Develop a Memorandum of Understanding ▪ Discuss common goals, key gaps, indicative of possible shared actions and ways of resourcing the actions (internal and external resources and funding opportunities) in particular discuss the resourcing of a project coordinator to assist with coastal planning and engineering matters; and ▪ Establish key responsibilities (e.g. monthly meetings to monitor progress of the CHRMAP).
5.	Develop a series of support and guiding documents: ▪ Funding Agreement ▪ Communication Strategy ▪ Project Coordinator duty statement; and ▪ Project Plan.
6.	Develop a community and stakeholder engagement strategy which may include: ▪ Disseminate information on the Gingin Dandaragan Coastal Partnership and CHRMAP to external stakeholders including the community. Potential communication channels include: ▪ A website. Community and stakeholder groups can be referred to this site to learn more about the project and the project's scientific and policy framework (see the Eastern Solent Coastal Partnership website http://www.escp.org.uk) ▪ Regular Community Forums ▪ Scientific forums - agency and university can contribute to, and be informed about, the partnership's work to ensure latest science and knowledge is integrated into the project and to foster the development of key networks; and ▪ Regular communication and networking forums with coordinators from other coastal collaborations, such as the Peron Naturaliste Partnership and the Cockburn Sound Coastal Alliance (CSCA), as well as the Australian Coastal Society (ACS). This will ensure that learnings from regional collaborations external to the Northern Agricultural Region (NAR) will be integrated into this process.
7	While undertaking the risk assessment it is recommended to seek advice on the legal implications associated with communicating this information to community and stakeholders. Legal advice provided to other local governments is available through PNP and CSCA.
8	Review the Gap Analysis Recommendations and identify funding opportunities and timeframes for implementing these recommendations.

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1. Introduction

Local governments are best placed to ensure that their coastal communities are informed about, and prepared to deal with, the impacts of hazards caused by changing coastal processes. Assessing historic, current and future coastal change at the local scale provides information that is meaningful for local town and infrastructure planning and management and improves understanding among the community about local coastal dynamics and future risks. However, undertaking site-specific coastal hazard and risk assessment at the local scale can be difficult given the uncertainty of climate change science, the lack of long-term and site-specific data sets, and the amount of resourcing required. A further challenge is that once the information is available it needs to then be incorporated into planning mechanisms, governance and operational actions.

A range of policies and guidelines are in place to support local governments to assess risks from changing coastal processes and to identify strategies for managing these risks in consultation with the community. Figure 2 shows the standardised approach recommended by the *Western Australian State Planning Policy 2.6 (SPP 2.6)* for dealing with risk in the coastal zone. The risk-based approach is widely used by local governments across Australia for dealing with the complexity of decision-making for the coastal zone and is widely used by many local governments across Australia. Other initiatives include:

- State Government (2010) *Sea Level Change in Western Australia - Application to Coastal Planning (Bicknell 2010)*
- WA Department of Transport's *Coastal Adaptation and Protection Grants (CAP)*; and
- WA Department of Environment and Conservation (2012) report, *Adapting to Our Changing Climate* (DEC 2012).

Figure 1: Gingin Dandaragan Coastal Workshop July 2013

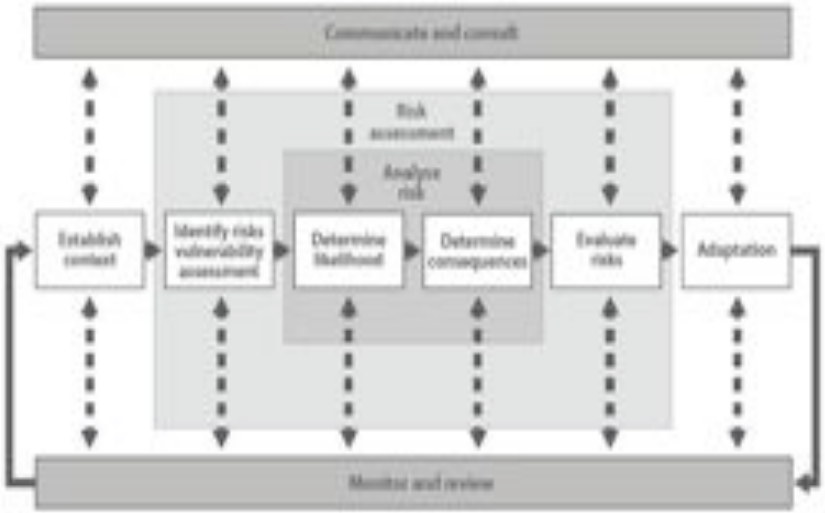

Figure 2: The Coastal Hazard Risk Management and Adaptation Planning process (CHRMAP) (WAPC, 2013)

1.1 The Gingin Dandaragan initiative

Coastal processes do not stop at a local government boundary. Partnerships between adjacent coastal councils have formed to collaboratively undertake coastal hazard and risk assessments and develop adaptation plans. Examples of successful partnerships are the *Peron Naturaliste Partnership* (PNP), the *Sydney Coastal Councils* group (SCC) and the *Cockburn Sound Coastal Alliance* (CSCA). Amongst the numerous benefits are sharing data and resources, increasing funding opportunities, developing consistent policy for landholders and developers, and avoiding duplication of effort. Aligned agencies sending consistent messages attained through joint studies can achieve a greater lobbying voice with state and federal ministers and departments (Vickery and Danese 2013).

The Shire of Dandaragan, the Shire of Gingin and NACC are in the process of considering a partnership to undertake the first steps of the CHRMAP process. The aim of this partnership is to take an informed and measured approach to decision-making for the coastal zone between south of Guilderton and North Head to help identify suitable locations for future development and placement of coastal infrastructure as well as indicative timeframes to help maximise public and private investment.

The first step of the Gingin-Dandaragan-NACC initiative was to:

- establish the project context by convening project partners to discuss aims, objectives and priorities
- undertake a data and information gap analysis; and
- discuss with key stakeholders the findings of the gap analysis and the required key steps for undertaking a CHRMAP process in the *Hill Primary Coastal Compartment* (Figure 3).

This Document collates the outcomes of the Workshop held at the Ledge Point Country Club on 17 July 2013.

1.2 Aim and Objectives

The objectives of the workshop were to:

- learn about coastal processes and hazards affecting the *Hill Primary Coastal Compartment*
- learn about coastal hazard risk management tools that help coastal managers assess and reduce risk to coastal assets
- learn about the CHRMAP process and next steps for undertaking this process in the *Hill Primary Coastal Compartment*
- strengthen multi-agency partnerships; and
- Identify potential networks and sources for collaboration to support the next phases of the project.

Figure 3: The *Hill Primary Coastal Compartment* comprises of the Shires of Gingin and Dandaragan.

2. Methods

A total of 38 participants attended the workshop, which was held at the Ledge Point Country Club on 17 July 2013 and facilitated by WALGA Sustainability Facilitator, Rob Weymouth. In order to keep numbers to a manageable size, participation was through invitation (see Appendix D for the list of attendees). Participants included:

- officers and elected members from the Shire of Dandaragan and the Shire of Gingin
- climate change and environmental officers from WALGA
- coastal engineer from Department of Transport
- policy makers from Department of Environment and Regulation
- coastal officers from the Northern Agricultural Catchments Council
- sustainability, geomorphology and planning specialists from Curtin University and Curtin University Sustainability Policy Institute (CUSP); and
- representatives of key community groups such as 'Friends of', 'Coastcare groups' and Community Progress Associations.

Coastal specialists added value to discussions by answering questions and providing input during the workshop. These included:

- **Professor Garry Middle**, head of the Department of Urban and Regional Planning at Curtin University (WA). Garry is an environmental planner with over 30 years of experience in the field, working for State and Local Governments. Garry is also the coastal representative on the Western Australian Planning Commission (WAPC) board and the chair of the WA

"making decisions on the coast including those about climate change requires making decisions in the face of uncertainty" (Prof. Garry Middle)

Coastal Planning and Co-ordination Council
- Lindsay Collins
- Karl Ilich
- **Associate Professor Laura Stocker**, lecturer and researcher in sustainability at Curtin University
- **James Duggie**, Principal Policy Officer in the Department of Environment and Regulation (Climate Change Unit). He sits on numerous climate change adaptation committees such as the PNP and the CSCA
- **Joanne Ludbrook**, Peron Naturaliste Partnership project coordinator; and
- **Chiara Danese**, director of Coastal Focus consultancy. Chiara also brings her experience as the coordinator of the CSCA project and as the Convenor of the Western Australian branch of the Australian Coastal Society.

In order to achieve the workshop objectives a 10-step approach was developed (Appendix E). Each session is outlined in detail in the sections below.

Figure 4: Gingin Dandaragan Workshop at Ledge Point.

2.1 Workshop Agenda

WELCOME: Michael Aspinall (Shire of Gingin) welcomed participants and opened the workshop.

SESSION I 'PROJECT BACKGROUND': A presentation by Ashley Robb (NACC Coastal & Marine Program Coordinator) about the CHRMAP. The following questions were discussed:

Q: What is a CHRMAP process?
Q: Why are we undertaking this process?
Q: What are the first steps in the process?

SESSION II 'IDENTIFYING COASTAL ASSETS': A presentation by Chiara Danese (Coastal Focus) to explain what coastal assets typically occur along the coast that could be at threat from coastal hazards and what value these assets provide to the community. The presentation and subsequent open room discussion helped address the following questions:

Q: What natural and built assets occur along the coastline?
Q: What services do these assets provide to our communities?
Q: What value do these assets provide?

SESSION III 'COASTAL HAZARDS': A presentation by Chiara Danese (Coastal Focus) about coastal hazards relevant to the Hill Primary Coastal Compartment and coastal processes affecting such hazards. The presentation and subsequent open room discussion helped address the following questions:

Q: What are the main coastal hazards that create risk to coastal assets?
Q: What coastal processes affect coastal hazards?
Q: What tools are available to planners and managers to identify risk to coastal assets?

PANEL DISCUSSION: Q&A with the expert panel.

SESSION IV 'COASTAL DATA SETS: A presentation by Chiara Danese (Coastal Focus) about the key data sets necessary for understanding coastal processes at the broader (regional) scale as well as at a more detailed (local) scale. The presentation and subsequent open room discussion helped address the following questions:

Q: What data and information do we need to understand coastal processes?
Q: What data sets do we have? And how accurate are they?
Q: What data sets do we need?

SESSION V 'MANAGING COASTAL HAZARD': A presentation by Karl Ilich (DoT) outlining the role the DoT plays in collecting coastal data and providing advice and expertise to local government and land managers on how to mitigate risks to coastal hazards (short term and long term).

SESSION VI 'PLANNING AND LIABILITY?': A presentation by Professor Garry Middle (Curtin University) about planning requirements as per the revised SPP2.6 for undertaking a CHRMAP process and the potential liabilities involved in undertaking a CHRMAP process. The presentation and subsequent open room discussion helped address the following questions:

Q: Who are the relevant people or organisations to enable a CHRMAP process?
Q: *Who are the relevant people or organisations to implement CHRMAP process?*

SESSION VII 'COMMUNICATION AND COLLABORATION': This session aimed to identify ways to effectively inform internal staff, councillors and the community throughout the CHRMAP process. It also helped to identify risks and benefits of partnership approaches for undertaking CHRMAP. The Coordinators of the PNP (Jo Ludbrook) and CSCA (Chiara Danese) projects shared lessons learned. The presentation and subsequent open room discussion helped address the following questions:

Q: How can we effectively communicate internally throughout the CHRMAP process?
Q: How can we effectively engage and communicate with the community throughout the CHRMAP process?
Q: What are the risks and benefits of these approaches?

SESSION VIII 'COASTAL PROTECTIONS': A presentation by Karl Ilich (DoT) to identify options for managing immediate coastal hazards of erosion and inundation.

PANEL DISCUSSION: Q&A with the expert panel. A group discussion about similar projects in other regions and states.

3. Outcomes

Session I: CHRM Process

This session aimed to inform participants about key steps and requirements for undertaking a Coastal Hazard Risk Management and Adaptation Planning (CHRMAP**)** process. This CHRMAP is designed to assist decision-makers in considering coastal hazard risks to coastal assets and to evaluate their effects, consequences and likelihood, and then to identify effective solutions for how to respond. The CHRMAP process as outlined in SPP2.6 follows a standardised approach adapted from the International *Standard Risk Management Principles and Guidelines ISO 31000:2009* (Standards Australia 2009). The CHRMAP helps to identify appropriate locations and timeframes for maximising the asset value of public infrastructure and inform private property owners of risk through mapping and notifications on titles. The key elements of a CHRMAP are:

1. identify the objectives, scope and approach to the risk analysis. It also aims to identify and value coastal assets
2. identify vulnerable areas to coastal processes such as wind, waves, sea levels and storms, and potential risk to coastal assets caused by these processes; and
3. develop adaptation plans to mitigate and adapt to risk.

The Gingin-Dandaragan-NACC initiative is a response to the new policy initiatives that require local governments to undertake a CHRMAP process and work with the 0.9m sea level rise benchmark for a 100 years planning timeframe. This response is considered the 'duty of care' of local governments as they have legal obligations to take into account the latest science and develop policy measures and decision-making frameworks for coastal adaptation.

NACC Coastal Program Coordinator Ashley Robb set out the aims of the Gingin-Dandaragan-NACC initiative and the potential benefit of a new partnership between the Shires of Gingin, Dandaragan, and the NACC.

"What do you tell those home owners whose houses may be subject to inundation?" (workshop participant)

Session II: Coastal Assets

This presentation discussed:

Types of assets that occur along the coast.

- Participants were asked to provide a few examples of natural and built assets that occur along the Hill Primary Coastal Compartment as well as the functions and services that these assets provide. Key assets were identified as follows: Built assets*:* caravan parks, foreshore reserves, groynes, boat ramps, houses, surf clubs, jetty and marina, roads, paths and Ledge lookout. Services: tourism, electricity, water, gas, waste and ramps. Natural assets: marine habitats, estuaries, dune habitats, beaches, reef, biodiversity (plants and animals), ecosystems, wetlands, fishing, seagrass, aquifer and rivers. Cultural assets: grave sites, ruins, wrecks and meeting places.

The 'values' that coastal assets provide to the community.

- The presenter explained that the value of an asset is related to the 'functions' and 'services' that this asset provides. As an example, in the context of climate change one important function of coastal natural areas (e.g. dunes, beaches, and rocky shores) is the regulation of disturbances such as storm surge. Examples of goods (products of the ecosystem) and services that benefit, sustain and support the wellbeing of people are recreational and tourism benefits, cultural benefits and sense of place.

How to integrate the information on coastal assets into the CHRMAP process:

- The first step is to identify and categorise coastal assets along the study area including services and functions that the assets provide.
- The second step is to estimate the economic and/or non-

"… start with the end. You think about what the values are and what you're trying to manage". (Chiara Danese)

economic value of these assets. Different methodologies should be used rather than just an economic analysis.

- The third step is to undertake a recession and inundation impact assessment for the study area and identify areas potentially vulnerable to coastal hazards (inundation and erosion).
- The fourth step is to use the information from the impact assessment and through a risk assessment process (as per SPP 2.6) estimate the 'value at risk' of assets potentially impacted in the next 100 years.

The following questions were raised during the open room discussion:

Q: How can we be sure assets that the individual and community value will be included in a mapping process?

A: The mapping process is inclusive of social, cultural and economic values and involves the community. Local rather than regional assessments would provide a value to individual properties.

Q: How far in from the coast do you value assets?

A: It varies... For Cockburn the boundary was 250m determined by the coastal vulnerability assessment, and drawing on the projected shoreline by 2100 and areas likely to be impacted by inundation. For Mandurah the risk area is 200-300m.

Q: What do you tell those home-owners whose houses may be subject to inundation?

A: These studies are necessary because land managers who have a duty of care to advise property owners about the potential future risk to property, based on best information available, such as government policy and science.

These studies also help land managers to maximise the return on investment in public infrastructure, such as car parks, roads, boat ramps, etc.

Q: Is funding available for erosion and inundation mapping?

A: DoT funds these studies through the CAP grants.

Figure 5: Coastal recession at Thirsty Point – photo Paul Robb.

Session III: Coastal Hazards

This presentation was about:

Hazards that can pose risks to coastal assets: There are several types of hazards on the coast such as coastal inundation, erosion, recession, accretion and saltwater intrusion caused by coastal processes. It is important to improve our understanding of how these coastal processes operate at different spatial and time scales and how these processes can become a risk to assets.

Key coastal processes that drive shoreline change along the *Hill Primary Coastal Compartment:* A combination of coastal processes cause the shoreline to change and different shorelines respond differently to coastal processes (such as rocky versus sandy coasts), hence the importance of understanding the geological and geomorphological features of the coast (not just the metocean drivers).

Coastal hazard mapping tools: Hazard maps are popular tools to describe how the coastline will change between present day and year 2100. Many local governments across Australia have developed these tools (for example, PNP, CSCA and the City of Clarence).

The following questions were raised during the open room discussion:

Q: Are the models that describe coastal hazards accurate?

A: Models are as good as the quality of data input to generate the model. It is not always possible to model coastal processes because they are often subtle responses that are difficult for models to pick up.

Q: People cause most of the damage to the dunes in Cervantes. Where do we group human overuse of the coastline with respect to hazards?

A: It sits under erosion.

Q: Do coastal interventions become coastal hazards? A: Protective measures can be the cause of another problem. In Europe and the US the approach is to build less hard coastal protections and explore innovative soft(er) coastal protection solutions first.

Q: At what point do you call sea level 'zero' in order to measure the level that is rising?

A: The absolute zero is not as relevant as the rate of SLR. Fremantle has over a hundred years of sea level observations. Based on this data the average rate of SLR is calculated to be approximately 1.5mm per year for the past 100 years.

Panel Discussion

Coastal specialists responded to questions from participants.

Q: To what extent have hazard assessments and mapping been carried out?

A: Jo Ludbrook (PNP) commented that while coastal hazard maps and assessments are important to decision making, they do not provide certainty. Lindsay Collins (Curtin) added that rear-guard action is common to get the information required. Garry Middle (Curtin) clarified that making decisions on the coast including those about recession and inundation requires making decisions in the face of uncertainty. James Duggie (DER) also reiterated that decision makers, like judges and juries, make the best decisions they can with the information at hand. Making decisions about adapting to recession and inundation involves individuals, stakeholders and all levels of government. It should be a whole of community response rather than local governments making decisions by themselves.

Q: What are the implications of 0.9m SLR by 2100 for the coast?

A: Lindsay Collins clarified that the result is higher wave energy resulting in more sediment transport to the coast, and that this process can often be modelled.

Q: What is the risk to our coast from people recreating relative to the risk of natural hazards, and will the risk from people be taken into account in hazard studies?

A: Chiara Danese (Coastal Focus) commented that people traffic has to be managed where it occurs and that impacts must be channelled into specific areas to protect high value areas. There are strategies and programs to do this. Inundation and recession mapping should pick up human impacts, which are an important factor in assessing the adaptive capacity of the coast, that is, the capacity of the coast to cope with changes to the environment. Human impacts occur in specific areas whereas climate change will impact the entire coast.

Ashley Robb (NACC) clarified that the reason the Shires of Gingin and Dandaragan are working together on this issue is because they are focussing specifically on the Hill Primary Coastal Compartment that consists of similar landforms. Compartmentalising the coast assists with strategic and natural resource management planning on the coast and allows for cost efficiencies across a compartment. Karl Ilich (DoT) explained that compartments allow the coast to be managed according to its physical features.

This session aimed to:

Improve understanding of data requirements for regional and site-specific hazard mapping.

- Existing data and information available in the region, data gaps and key recommendations in relation to data collection were covered and are set out in Danese, C. (2013) *Information & Data Gap Analysis Gingin-Dandaragan Coast Report*.
- Broad scale (regional) hazard mapping are intended to be a 'first cut' assessment to provide planners and managers with a basic level of information regarding potential impacts of hazards on natural and built coastal assets. They usually identify areas that require additional investigations.
- Site-specific (sediment cell based) hazard assessments and mapping provide enough detail for land-use planning decisions such as setback lines and distances and areas subject to coastal inundation. They are undertaken for high value areas, urban areas and future development.

Session IV: Data sets

Describe the availability and relevance of coastal data sets for the *Hill Primary Coastal Compartment* for hazard assessment and mapping.

- Chiara Danese gave a description of the different coastal data sets types available for the study area (metocean drivers, geology, geomorphology, sediment transport and sediment studies, hydrology, groundwater, bathymetric studies and beach profiles), the agency responsible for the collection of the data and the relevance to hazard mapping.

Describe the key gaps in existing coastal data sets.

- There are significant gaps in current coastal data sets for the Hill Primary Coastal Compartment. The key data gaps are identified in Danese, C. (2013) *Information and Data Gap*

Analysis Gingin-Dandaragan Coast Report. Table 1 summarises the key gaps for site-specific hazard mapping, which include the following:

- Local-scale beach and nearshore surveys
- Description of geomorphological features at the local-scale (sediment cells) including features such as tombolos and cuspate forelands
- Historic analysis of water levels including storm surge heights associated with extreme weather events
- Local wave data collection
- Projected wave climate response to SLR scenarios
- Region specific sea level rise projections
- Current and long-term local-scale sediment transport regimes and sediment budget rates
- Freshwater flood mapping
- Geotechnical assessments nearshore and onshore (sediment/rock relationships)

The following questions were raised during the open room discussion:

Q: How do you prioritise data collection?

A: Data collection is prioritised in the Information and Data Gap Analysis Report (Danese 2013). The collection of some data is expensive and will require a partnership with the DoT over a number of years, especially for the bathymetries and the sediment budget. It is a question of resources and working out what resources are available.

Q: How much data do you need, and over what period of time does it need to be collected, for a reasonable decision to be made in relation to development?

A: Half of the data needed is baseline data some of which is quick and easy to collect. The other half requires ongoing monitoring and will involve making decisions about priorities. Baseline data provides a snapshot while ongoing monitoring provides an understanding of processes. It is important to do regional mapping first because there will be some strong learning through that process such as the location of hotspots and where these problems may transfer to other locations.

Experts can advise about what decisions can be deferred and those that need to be made now.

Q: What would be the cost of compiling a risk assessment report using available data so that Council could be confident to establish a set-back line for Jurien Bay development along, say, a four kilometre stretch of coastline?

A: More data is required. The Cockburn Sound Coastal Vulnerability Assessment (Fremantle to Rockingham including Garden Island, 45km) cost $160 000. It is important to note that there is a lot of good quality existing data for the Fremantle to Rockingham coastline.

Session V: Managing Coastal Hazards

Karl Ilich outlined the role the DoT plays in collecting coastal data and providing advice to local governments and land managers. The following key points were made:

- The DoT has a Coastal Protection Policy for Western Australia. However, legislation does not exist for coastal management or protection in WA where responsibilities are assigned to a government department or minister. As a result, responsibility for coastal management largely falls to local governments.
- CHRMAP is endorsed as the best process to manage the uncertainties associated with the impacts of climate change on the coast.
- The DoT provides $1 million in funding a year for hazard mapping through the Coastal Adaptation and Protection grants program.
- Coastal monitoring is critical for data acquisition and assessing changes; and
- Risk mitigation should follow the adaptation planning hierarchy as per SPP 2.6.

" CHRMAP is endorsed as the best process to manage the uncertainties associated with the impacts of climate change on the coast". (Karl Illich, DoT)

Session VI: Planning & Liability

" To what extent is Draft SPP 2.6 binding?" (workshop participant)

Gary Middle outlined the current WA planning context for climate change adaptation in WA and the legal issues that local governments need to consider in relation to climate change.

Council can protect itself from legal liability by going through a deliberate process of strategic planning. A deliberate process that can be demonstrated will offer protection against any legal action taken in relation to the adaptation options chosen.

Legal liability issues that local governments can expect to deal with include:

- Whether or not to release information relating to coastal hazards such as recession and inundation.
- Approve or refuse application for development that may be susceptible to climate change risks.
- Making changes to planning instruments to incorporate climate change considerations which affect existing development and, therefore, the issue of compensation that arises as a part of that whether or not to install protective structures.

Key points made:

- SPP 2.6 contains new and modified policy measures including a 150m setback for all new coastal development and the CHRMAP process.
- An adaptation hierarchy that Council is recommended adopt: (i) avoid; (ii) planned or managed retreat for existing assets; (iii) accommodation; (iv) defend or protect; the precautionary principle; meaningful community engagement.
- Climate change case law is indicative of the issues that local governments need to take into account in decision-making about climate change; and
- It is possible for Council to develop an adaptation strategy without defining where the actions

specifically take place.

Available resources:

- The Productivity Commission's (2012) report, Barriers to Climate Change Adaptation.
- WA Government (2012) climate change adaptation policy, Adapting to Our Changing Climate
- Planning and Development Act 2005.
- WA Government (2010) SLR policy, Sea Level Change in Western Australia: Application to Coastal Planning.
- State Planning Policy SPP 2.6

The following questions were raised:

Q: To what extent is Draft SPP 2.6 binding?

A: SPP 2.6 is prescribed under the Act and, therefore, has the weight of law. Therefore, local governments must comply with SPP 2.6 (the updated version endorsed in December 2012).

Q: Regarding Section 5.5 where a Council is aware of coastal failure, can Council take corrective action?

A: Council is recommended to go through the adaptation hierarchy giving due regard to good planning.

Q: What responsibilities flow to local governments from existing situations in a place like Seabird?

A: Every legal question is effectively unknown. However,

Figure 6: Setback at Cervantes. Photo – Paul Robb.

Jo Ludbrook presented an overview of strategies for communication and collaboration with the community for climate change adaptation. The Peron Naturaliste Partnership approach involving nine regional councils was cited throughout.

The following key points were made:

- In building capacity and communication as part of a risk assessment, consultation with the community should start early in the process. Early engagement will facilitate the following outcomes and processes:
    - Internal communication strategies are underpinned by agreement between councils about shared values and key messages.
    - A multifaceted approach is required that comprehensively engages a range of stakeholders.
- Chiara Danese stressed the importance of champions within council for creating and sustaining momentum of the process, and for allocating resources toward the process. Gary Middle was more cautious, noting that processes can become too reliant on champions, with the potential to fall apart when the champion leaves. Gary Middle added that the process needs to be a responsibility shared by all involved, therefore capacity building within the project needs to occur.
- Gary Middle also pointed out a number of benefits of working in partnerships: first, the project is taken more seriously by the project partners and funding agencies. A local government by itself is less likely to be able to match State and Federal government funding. Second, sharing resources enables councils to gather and process data across a wider area and avoid duplication of studies and research. Third, social learning transpires through sharing of information and ideas.

" In building capacity and communication as part of a risk assessment, consultation with the community should start early in the process". (Chiara Danese)

The second part of Karl Ilich's presentation focused on what local governments can do to mitigate risks from coastal erosion and inundation.

Key points:

- The CHRMAP process aims to assist local governments in planning and managing for erosion and inundation. The CHRMAP (as explained in Session I) involves the following steps: Monitor processes; define hazards; plan adaptation; reduce uncertainties; maintain future flexibility; and, reduce risk and realise benefits. In particular coastal managers are recommended to consider the adaptation hierarchy.
- A range of risk adaptation options should be investigated down the adaptation hierarchy (from avoiding areas at risk to protecting development from those risks) as indicated in the SPP2.6 guidelines. The SPP2.6 (section 4.3) states "*as such, avoiding the placement of sensitive development within areas that are at risk from coastal hazards provides the most resilience to future (uncertain) coastal hazards. Conversely, using protection structures to allow sensitive development within areas that would otherwise be at risk from coastal hazards provides the least resilience to future (uncertain) coastal hazards*".
- Resources are available on the DoT web site to support the above process such as the beach monitoring guide, How to Photo Monitor Beaches (DoT 2012).
- Case examples of adaptation include retreat, adapt and defend options. For example, the no-regret retreat option of the Cockburn coastal bike path.
- Apply for funding early from DoT, Royalties for Regions, Federal government funding options, development commissions and universities.

The following questions were raised:

Session VIII: Coastal Protections

" A range of risk adaptation options should be investigated down the adaptation hierarchy (from avoiding areas at risk to protecting development from those risks) as indicated in the SPP2.6 guidelines. (Karl Illich, DoT).

Q: What are the down drifting parts of a geotextile bag structure on a sandy coastline?

A: The seawall acts like a groin where the beach in front of the seawall erodes and impacts negatively on the beach next door.

Q: How do geotextile bags compare to sand nourishment in terms of the down-drifting parts?

A: Sand nourishment slowly erodes away in winter storms and is washed offshore permanently or temporarily. If temporarily, sand may be washed back onto the beach and/or washed along to the beaches next door.

Q: What is the cost of beach nourishment?

A: The major cost is buying and trucking in the sand unless it is available locally. The cost of beach nourishment in Esperance is about $100 000 per year. One hundred metres of sand bags would cost in the vicinity of hundreds of thousands of dollars. Cost is all about context.

Figure 7: Hard coastal protections at Marina di Pisa (Italy). Photo – Enzo Pranzini.

Panel Discussion

The Panel made comments in relation to funding opportunities for adaptation processes. The main points include:

- Gary Middle (Curtin): If a community is choosing to defend a coast, then those residents who benefit from that amenity value should pay.
- Laura Stocker (Curtin): Currently the approach to funding is not equitable. Adaptation in Port Geographe Bay, for example, is being funded by the State government for $30 million whereas the DoT has a total budget of $1 million to fund local governments across the State.
- Rob Weymouth (WALGA) and Laura Stocker: WALGA could advocate for a broader and more equitable distribution of funding.
- James Duggie (DER): Current policy in Western Australia relevant for funding is the Department of Environment and Conservation (2012) Adapting to Our Changing Climate Strategy. This is an important overarching statement that endorses the need to adapt to the impacts of climate change. However, no additional funding has been made available to address climate change impacts. The in-principle position statement between the federal, state and territory governments The Roles and Responsibilities of Climate Change Adaptation in Australia (http://www.coag.gov.au/sites/default/files/Roles%20and%20Responsibilities%20for%20Climate%20Change%20Adaptation.pdf), discusses the respective roles of the three tiers of government and the private sector with a few references to funding. Climate change will have to be managed by those who have existing responsibilities for risk management of assets.
- Laura Stocker: Coastwest (DoP) provide small grants for coastal management and adaptation options such as community education or policy learning activities. Development commissions could be the source of funding for

"Where can we apply for large amounts of funding? What opportunities are there for private industry to assist"? (workshop participant).

strategic planning and adaptation measures.

- Gary Middle: State and federal funding pools are shrinking. LG can increase chances for funding by feeding into the strategic goals of government. There is a limit to what LG can expect from government over the next 5-10 years.
- James Duggie: Both state and federal funding prioritise partnerships and innovative, best practice projects as opposed to projects that need to happen and are common to all.
- Laura Stocker. With respect to university funding, Linkage Grants provide a federal research grant that matches an industry partner such as local government dollar-for-dollar. Such a grant could fund the research gathering part of the CHRMAP process. The Australia Research Council is also interested in funding innovative projects.
- Karl Ilich (DoT): Royalties for Regions.
- Laura Stocker: The cost of retreat should be given serious consideration as should the ecological and social value of the land.

Q: Where can we apply for large amounts of funding? What opportunities are there for private industry to assist?

A: In the Cockburn area, industry plans to deal with problems as they arise and are not prepared to fund LG climate change adaptation projects.

Q: Is the insurance industry a potential source of funding?

A: In Brisbane, the response of the insurance industry to increased risk of flooding has been to develop a strategy for the government to build levies and reduce the flood risk. The insurance industry is not prepared to contribute to mitigation measures.

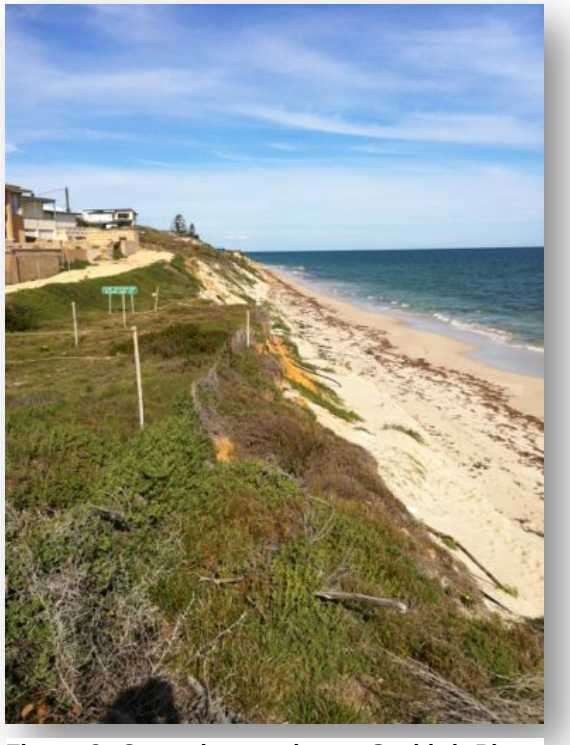

Figure 8: Coastal recession at Seabird. Photo NACC.

4. Summary

The following key points were raised and discussed at the workshop:

- Local governments must ensure that their coastal communities are informed about, and prepared to deal with, the impacts of hazards caused by changing coastal processes.
- Litigation regarding coastal assets is likely to proliferate and increase the burden on local governments as coastal population continues to grow and more assets are placed on already vulnerable coastlines.
- Assessing historic, current and future coastal change at a regional scale provides a first-cut assessment of how the coastal compartment is likely to change due to coastal processes, and will help identify areas that will require detailed local level assessments and data collection.
- Assessing historic, current and future coastal change at the local scale provides information that is meaningful for local level town and infrastructure planning and management and improves community understanding about local coastal dynamics and future risks.
- SPP2.6 requires local government to undertake CHMRAP to identify risk to coastal processes and identify adaptation measures need to be prepared to reduce those risks down to acceptable or tolerable levels.
- The State government provides support for coastal management through grants (Coastwest, CMPAP, CAP) and advice (DoP and DoT).
- Undertaking site-specific recession and inundation mapping can be a difficult and onerous task due to the lack of long-term and site-specific data available and the amount of resourcing required for gathering data. However, by law, local governments are required to provide information to their communities that is based on best science and policy information available at that time under duty of care responsibilities. If Council fails to make information about inundation and recession available to the community they may be deemed negligent by the courts (the same applies to planning decisions). The immunities provided by the Civil Liabilities Act do not necessarily protect Councils and officers from such civil actions, as officers may be found to not have acted in good faith. To date there has not been any legal advice or case law indicating Council liability arising from the disclosure of information about coastal hazards concerning coastal hazards to the general public and/or property owners and developers.
- The information gathered on coastal vulnerability and potential risks must be incorporated into planning mechanisms, governance and operational actions.
- There is a need for on-going support from State and Federal governments to undertake CHRMAPs.

The key concerns raised at the workshop are:

- Immediate coastal risk and how the Gingin-Dandaragan process will help address these challenges,

- Accuracy of modelling and coastal data sets,
- Who is responsible for undertaking a CHRMAP,
- Impacts of off-road vehicles and urban development along already vulnerable coastal areas; and
- Liability of Councillors and councils.

Feedback from participants:

The full feedback analysis can be found in Appendix F.

- Presentations were useful particularly the presentations on coastal processes and planning for climate change adaptation.
- The workshop provided opportunities for learning, sharing knowledge and networking.
- Most respondents rated the structure of the workshop highly.
- The workshop was well designed and implemented to meet its objectives.
- Perceived knowledge levels of participants on key topics increased following the presentations.
- To the question: How confident are you that this workshop will help Shires respond to coastal science and related government initiatives such as the Draft State Planning Policy 2.6 (State Coastal Planning Policy)? This question was answered by 25 respondents who rated on average a confidence level of 5.5 or high.
- Additional comments:
    - There are still legal gaps in process and policy.
    - Would like to see a shorter version of workshop so that it could be delivered to councils in a forum - say 2 hours.
    - Has allowed me to understand SPP2.6.
    - Relying on willingness of individuals to step forward.

5. Recommendations

(to be read in conjunction with the recommendations from the Hill Primary Coastal Compartment Information & Gap Analysis Report – Appendix G)

1.	Identify lead officer(s) in each local government and partner organisations to provide the necessary internal follow up.
2.	Disseminate the gap analysis and workshop summary reports internally to key staff and elective members via presentations.
3.	Each local government to explore how the outcomes of the CHRMAP are likely to be incorporated into strategic and statutory planning, environmental and engineering strategies, policies and plans, including coastal management plans. This should be undertaken prior to the formalization of the partnership (step 4).
4.	Joint meetings to: ▪ Formalise a collaborative partnership ▪ Develop a Memorandum of Understanding ▪ Discuss common goals, key gaps, indicative of possible shared actions and ways of resourcing the actions (internal and external resources and funding opportunities) in particular discuss the resourcing of a project coordinator to assist with coastal planning and engineering matters; and ▪ Establish key responsibilities (e.g. monthly meetings to monitor progress of the CHRMAP).
5.	Develop a series of support and guiding documents: ▪ Funding Agreement ▪ Communication Strategy ▪ Project Coordinator duty statement; and ▪ Project Plan
6.	Develop a community and stakeholder engagement strategy which may include: ▪ Disseminate information on the Gingin Dandaragan Coastal Partnership and CHRMAP to external stakeholders including the community. Potential communication channels include: ▪ A website. Community and stakeholder groups can be referred to this site to learn more about the project and the project's scientific and policy framework (see http://www.escp.org.uk) ▪ Regular Community Forums ▪ Scientific forums - agency and university can contribute to, and be informed about, the partnership's work to ensure latest science and knowledge is integrated into the project and to foster the development of key networks; and ▪ Regular communication and networking forums with coordinators from other coastal collaborations, such as the Peron Naturaliste Partnership and the Cockburn Sound Coastal Alliance (CSCA), as well as the Australian Coastal Society (ACS). This will ensure that learnings from regional collaborations external to the Northern Agricultural Region (NAR) will be integrated into this process.
7	While undertaking the risk assessment it is recommended to seek advice on the legal implications associated with communicating this information to community and stakeholders. Legal advice provided to other local governments is available through PNP and CSCA.
8	Review the Gap Analysis Recommendations and identify funding opportunities and timeframes for implementing these recommendations.

6. References

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7. Appendices

Appendix A: Study Area

Appendix B: Glossary

Appendix C: Acronyms

Appendix D: Workshop Participants

Appendix E: Workshop Structure

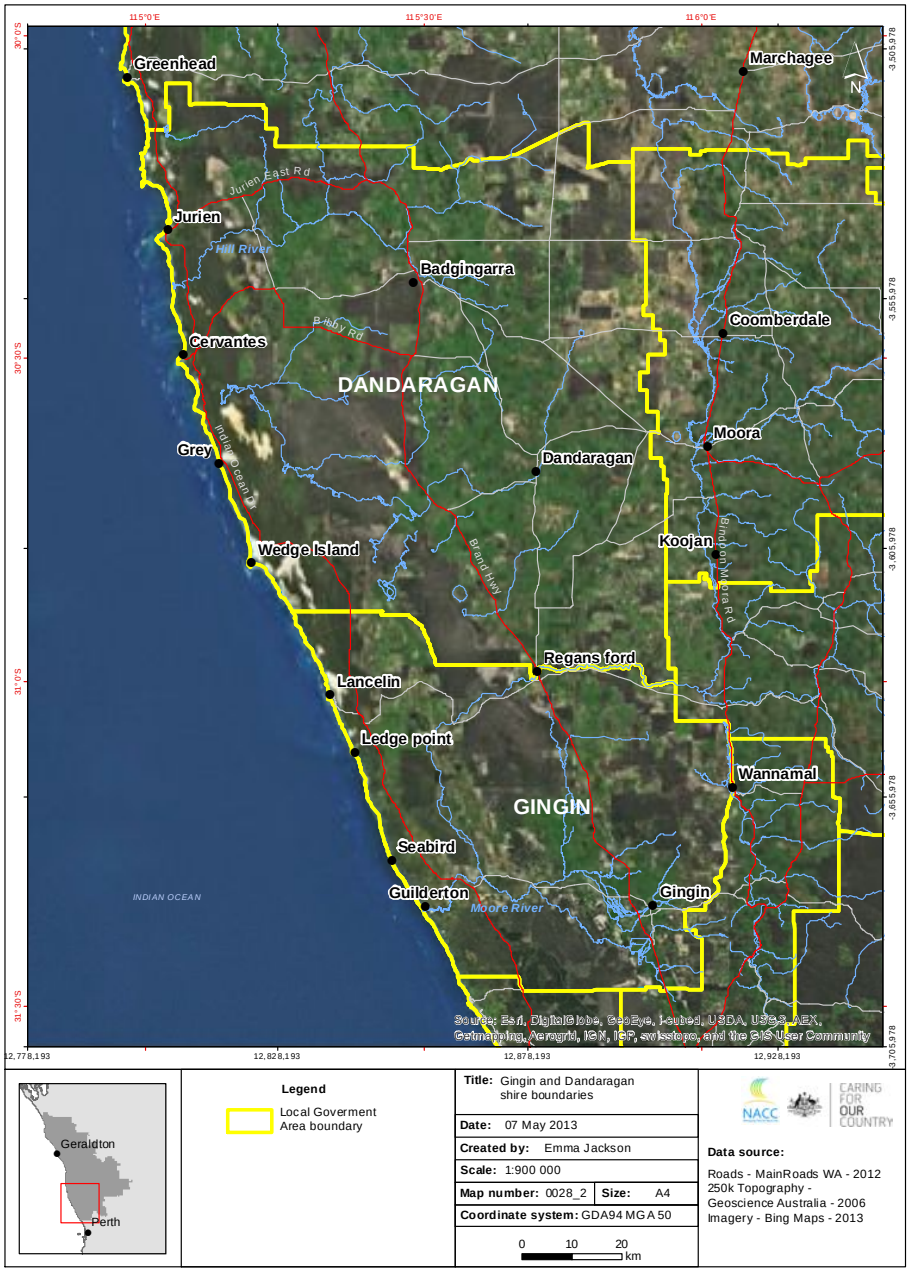
Appendix F: Feedback Analysis

Appendix G: Recommendations from the Information and Gingin Dandaragan Gap Analysis Report

Appendix H: Photos

Appendix I: Workshop Power Point Presentations (PDFs)

Appendix A: Study Area



Appendix B: Glossary

Adaptation: an adjustment in natural or human systems in response to actual or expected stimuli or their effects, which moderates harm or exploits beneficial opportunities. Adaptation is the primary means for maximising the gains and minimising the losses associated with climate variability.

Coastal assets: are **t**angible features of the built, natural and cultural environment that deliver a set of goods and services. These goods and services provide benefits to people and can therefore be assessed for their value to the community.

Coastal compartment: length of shoreline bounded by broad scale changes in geology, geomorphic structures/landforms or changes in the aspect of the shore.

Coastal hazard: the consequence of coastal processes that affect the environment and safety of people. Potential coastal hazards include erosion, accretion and inundation.

Coastal processes: any action of natural force that impacts the coastal environment such as winds, tides, currents, swell, etc.

Coastal protection: any permanent or periodic work undertaken primarily to alter physical coastal processes and/or manage the effects of coastal hazards. The influence of coastal protection works should be evaluated at the sediment cell level.

Erosion: shoreline movement where the shoreline shifts landward, reducing the width of a coastal foreshore reserve.

Metocean: an abbreviation of meteorological and oceanographic (processes).

Nearshore: the region of land extending from the seaward edge of the foreshore to the beginning of the offshore zone.

Risk assessment: the overall process or method for evaluating risks associated with a specific coastal hazard and includes risk identification, risk analysis and risk evaluation.

Vulnerability: the degree to which a system is susceptible to, or unable to cope with, adverse effects of changing coastal processes. Areas that are highly exposed (high energy coasts), sensitive (e.g. low-sandy coastlines) and less able to adapt (e.g. low vegetation cover) are most vulnerable.

Appendix C: Acronyms

ACS	Australian Coastal Society
CAP	Coastal Adaptation Protection Grants (DoT)
CHRMAP	Coastal Hazard and Risk Management Adaptation Process
CMPAP	Coastal Management Plan Assistance Program
CSCA	Cockburn Sound Coastal Alliance
CUSP	Curtin University Sustainability Policy Institute
LG	Local Government
DER	Department of Environment and Regulation (formed DEC, Department of Environment and Conservation)
DoP	Department of Planning
DoT	Department of Transport
MoU	Memorandum of Understanding
NACC	Northern Agricultural Catchments Council
PNP	Peron Naturaliste Partnership
SLR:	Sea Level Rise
SPP	State Planning Policy
WALGA	Western Australia Local Government Association
WAPC	Western Australia Planning Commission

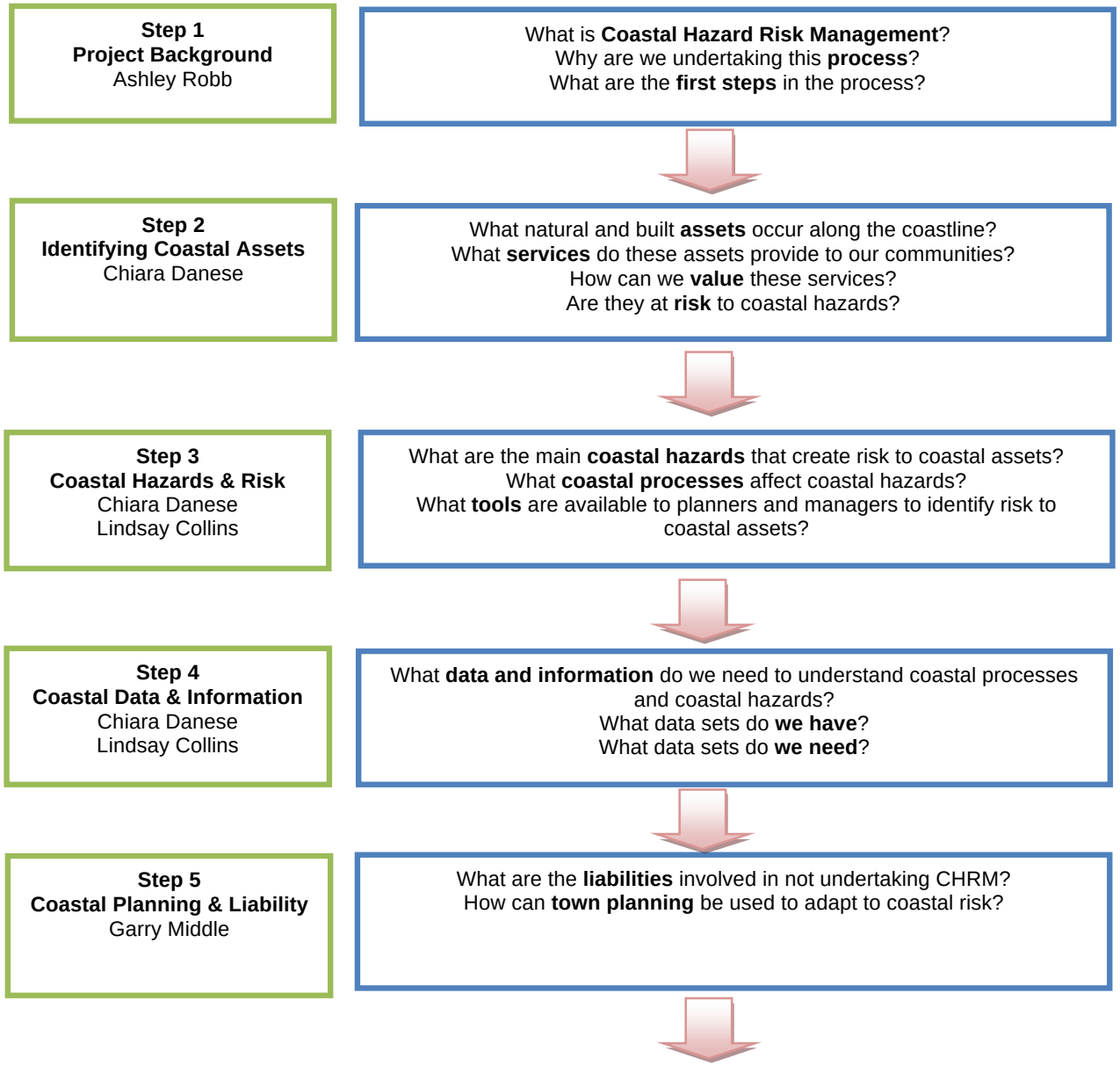
Appendix D: Workshop participants

Table 2: Workshop Participants

Last Name	First Name	Organisation	Role
Ammon	Val	Shire of Gingin	Councillor
Aspinall	Michael	Shire of Gingin	Councillor/President
Beale	Reg	Shire of Gingin	Councillor
Court	Jan	Shire of Gingin	Councillor
Tang	Kevin	Shire of Gingin	Planning Officer
Bailey	Tim	Shire of Dandaragan	Councillor
Chidlow	David	Shire of Dandaragan	Manager of Planning
Kent	Dave	Shire of Dandaragan	Councillor
Gibson	Wayne	Shire of Dandaragan	Councillor/President
Rennie	Ian	Shire of Dandaragan	Deputy CEO
Russell	Micky	Shire of Dandaragan	Councillor
Sheppard	Mike	Shire of Dandaragan	Councillor
Short	Lawrie	Shire of Dandaragan	Councillor
McGlew	Kay	Shire of Dandaragan	Councillor
Gilby	Geoff	Guilderton Community Ass.	Representative
Lamont	Gillian	Friends of Moore River Estuary	Representative

Last Name	First Name	Organisation	Role
Dunlop	Nic	Friends of Lancelin Coast	Representative
Richards	Jan	Ledge Point Coastcare Group	Coordinator
Thomas	Garry	Seabird Progress Assoc.	President/Representative
Stewart	Margaret	Cervantes Ratepayers and Progress Ass.	Representative
Ilich	Karl	Dept. of Transport Coastal Infrastructure	Coastal Management
Duggie	James	Dept. Environment and Conservation	Principal Policy Officer Climate Change
Stocker	Laura	Curtin University (CUSP)	Climate Change Adaptation
Middle	Gary	Curtin University & WAPC	Urban and Regional Planning
Collins	Lindsay	Curtin University	Geology
Ludbrook	Joanne	PNP	Climate Change Adaptation
Robb	Ashley	NACC	Coastal and Marine
Canny	Mark	NACC	Climate Change Adaptation
Love	Shane	NACC	Board Member
Wilson	Jill	NACC	Board Member
Bairstow	Jennifer	West Midlands Group	Natural Resource Management
Perks	Caroline	WALGA	Climate Change
Weymouth	Rob	WALGA	Facilitator
Danese	Chiara	Coastal Focus	Director
Kennedy	Deborah	Coastal Focus	Scribe

Appendix E: Workshop Structure (cont.)



Appendix E: Workshop Structure

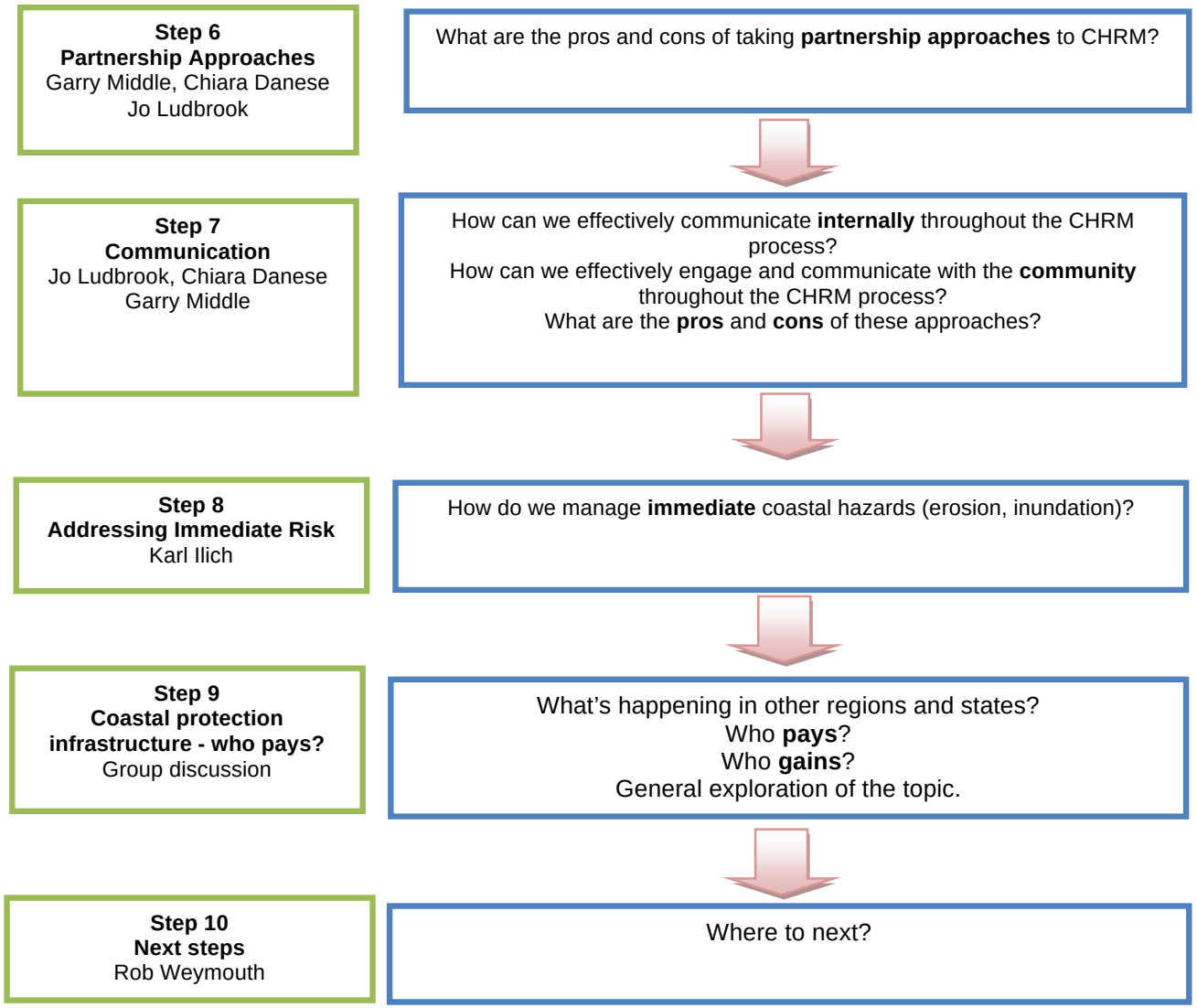


Figure 9: Workshop flowchart linking workshops objectives, methods and outputs.

Appendix F: Feedback Report

Gingin Dandaragan Coastal Hazard Risk Management Workshop

Geraldton, October 2013

Author: Rolan Deutekom, Social Science Research Officer at NACC

CARING FOR OUR COUNTRY

NACC
Managing Natural Resources

Introduction

A coastal hazard risk management workshop was conducted in the Northern Agricultural Region (NAR) on 17 July 2013. A total of 38 participants attended the workshop.

Funding for these workshops was provided by Caring for Our Country and the Northern Agricultural Catchments Council (NACC). The workshop aimed to engage the coastal community in raising awareness of coastal processes relevant to coastal hazard risk. Community feedback was recorded via feedback forms distributed at the end of the workshop.

26 respondents filled in a survey, but not all respondents filled in all questions.

Question 1a: What was the one thing you enjoyed most about this event?

25 respondents answered this question. Their answers can be found below.

Presentations (mentioned 12 times)

- Ludbrook/Gary Middle/Chiara Danese presentations
- Coastal planning, policy and law and coastal engineering.
- Very informative - case studies by Garry Middle
- Garry Middle's summary on legal liability and Chiara's discussion on coastal processes etc. I also enjoyed Jo's comms talk and Karl's breakdown of methods to adopt.
- Chiara!!
- Presentations good and made me more aware.
- Garry Middle
- Liability and coastal planning
- Enjoyed initiatives involved in undertaking a CHRM process. Legal and local government studies and outcomes.
- Governance and engineering talks
- Gaining info on the risk management plans
- Easy to follow speakers
- Learning, sharing knowledge (mentioned five times)
- Conversations - good opportunity for discussion (mentioned three times)
- Good overall (mentioned two times)
- Having all the players in the room

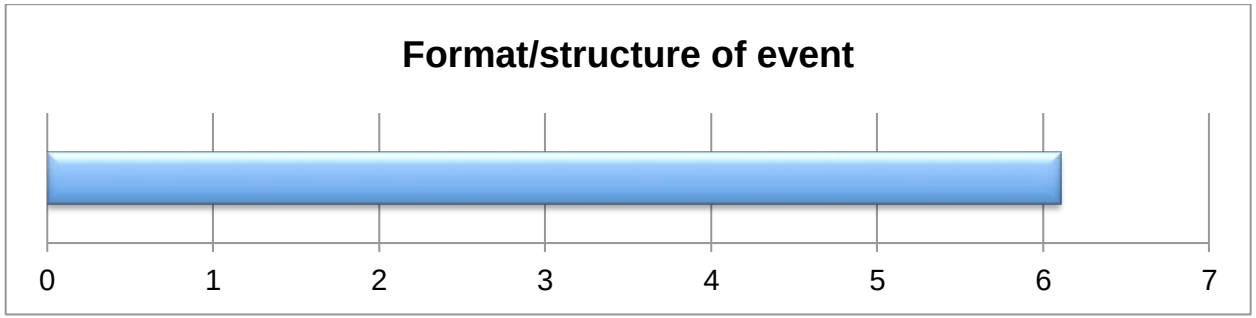
- Catching up with contacts
- Mix of people
- Food
- Talking with Shire councillors about their perspectives and challenges

Question 2b: What could be improved?

Eight respondents answered this question and their answers can be found below:

- Nothing - generally very good
- It is an emotive issue, need to control case studies by passionate individuals from hijacking discussion
- Maybe a direct presentation by a LG planner outlying a real issue? A better presentation on funding
- More local issues
- More WA case studies
- Better meeting - we should all be concerned
- More cream on the scones!

Question 2: How do you rate the format/structure of this event?

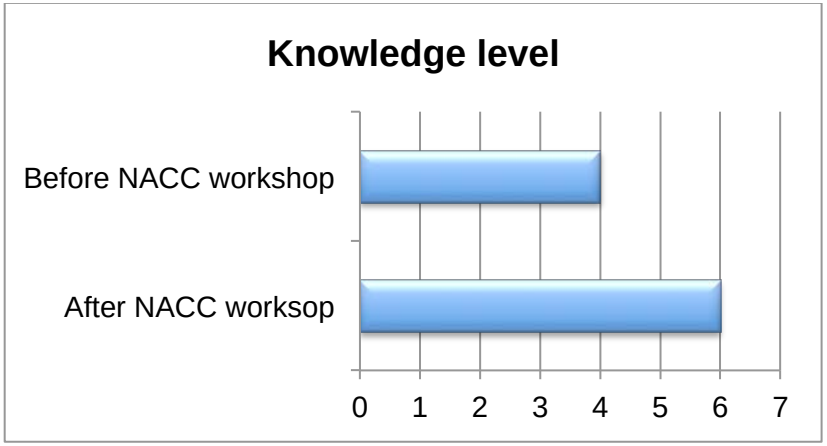


26 respondents answered this question. Most respondents rated the format/structure of the workshop as very good. Seven respondents provided the following comments:

- Very good, keep it up (mentioned twice)

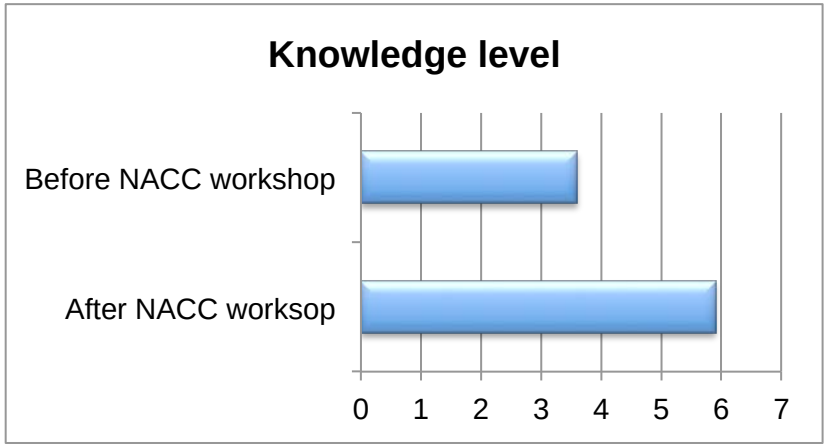
- ● Good representation across sectors
- Very good organising
- Chiara always makes a lot of sense
- The workshop was well designed and implemented for its objectives and based on comments for councillors
- Would like more group discussion.

Question 3a: Please indicate your knowledge level coastal processes relevant to coastal hazard risk:



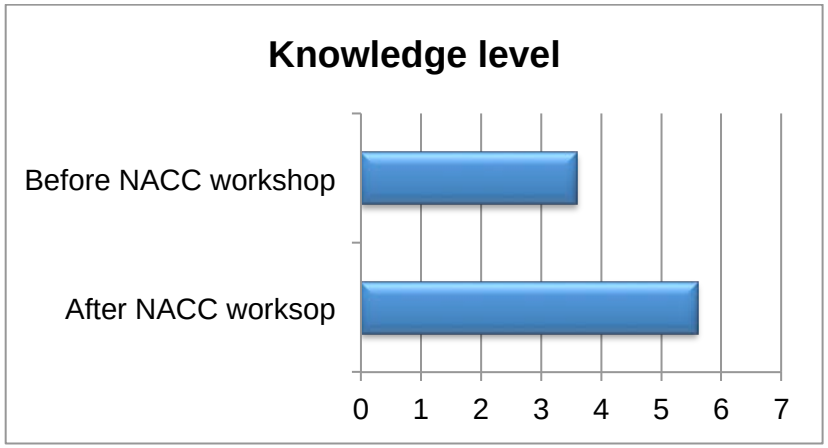
26 respondents answered this question. They indicated a (6 – 4) / 4 * 100% ≈ 50% increase in knowledge.

Question 3b: Please indicate your knowledge level on key data requirements for identifying risk in coastal areas:



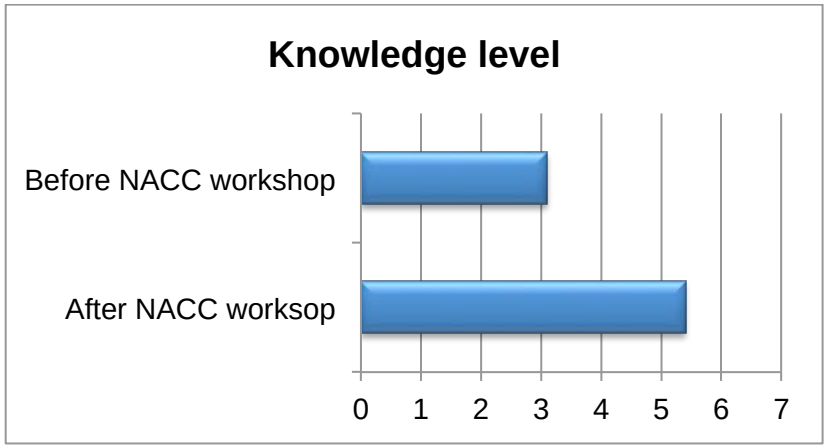
26 respondents answered this question. They indicated a (5.9 – 3.6) / 3.6 * 100% ≈ 64% increase in knowledge.

Question 3c: Please indicate your knowledge level on processes required for undertaking coastal hazard risk identification:



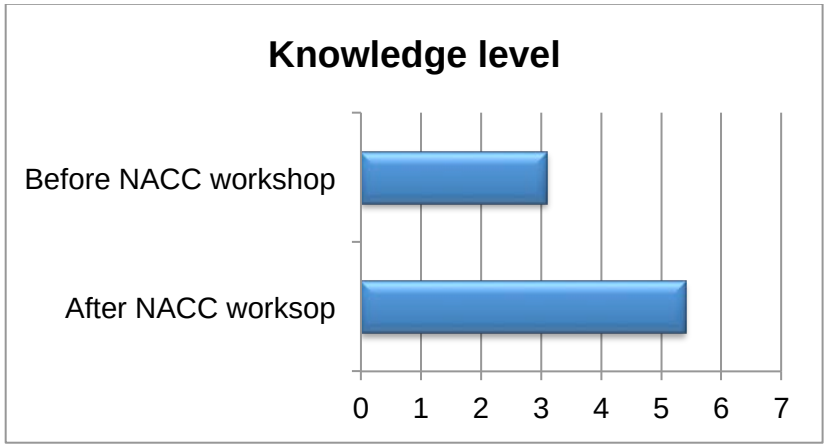
26 respondents answered this question. They indicated a (5.6 – 3.6) / 3.6 * 100% ≈ 55% increase in knowledge.

Question 3d: Please indicate your knowledge level on local planning instruments available to local governments for building risk management and adaptation responses into local planning policy:



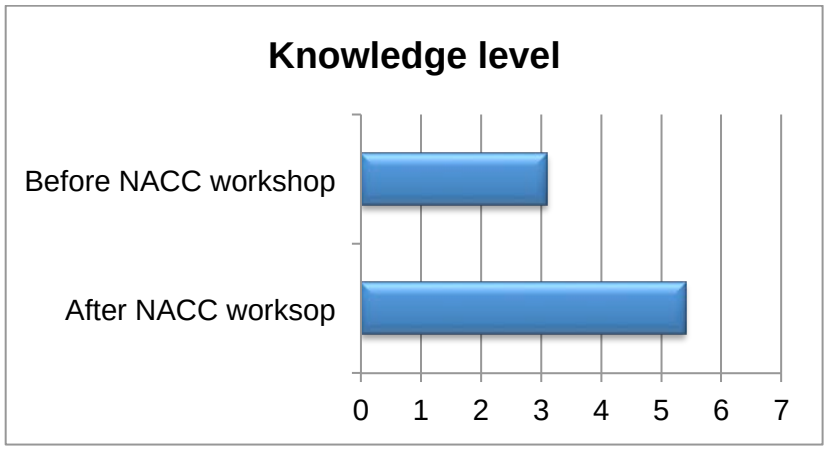
26 respondents answered this question. They indicated a (5.4 – 3.1) / 3.1 * 100% ≈ 74% increase in knowledge.

Question 3e: Please indicate your knowledge level on resource and governance *barriers* for identifying risk and responding to risk:



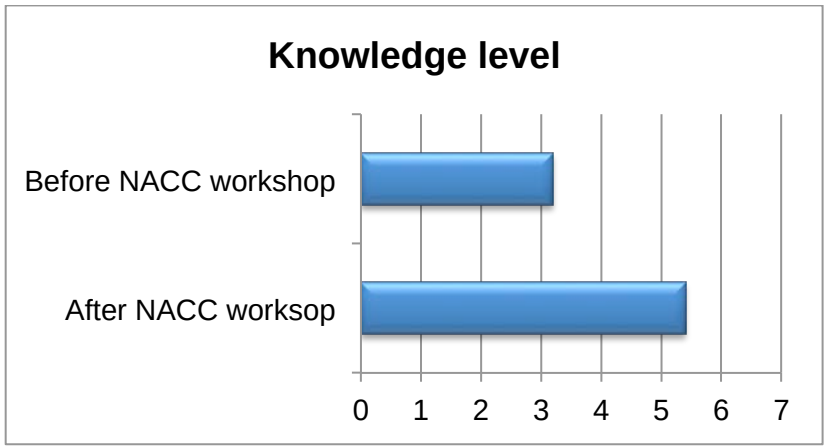
26 respondents answered this question. They indicated a (5.2 – 3.5) / 3.5 * 100% ≈ 46% increase in knowledge.

Question 3f: Please indicate your knowledge level on resource and governance *opportunities* for identifying risk and responding to risk:



26 respondents answered this question. They indicated a (5.5 – 3.3) / 3.3 * 100% ≈ 67% increase in knowledge.

Question 3g: Please indicate your knowledge level on methods for communication of risk and adaptation options to coastal communities:



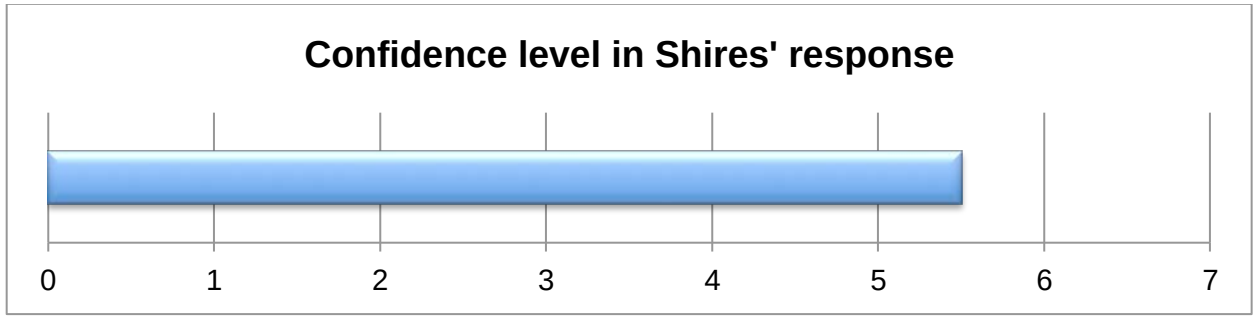
26 respondents answered this question. They indicated a (5.5 – 3.2) / 3.2 * 100% ≈ 72% increase in knowledge.

Six respondents provided additional comments:

- Garry's overview of the draft SSP was really informative, really liked the adaptation planning and demonstrating that you have gone through a strategic planning process.
- Encourage local governments to share opportunities.
- I found the workshop to be very informative and I think it would be valuable for a write up on the workshop and its success in WALGA's Eco-News and other LG publications broadly. I would also like to include it on WALGA's map project!! :)
- Thanks for your organising and planning. I look forward to the next one. Well done Ash and Mark!
- Don't stuff with nature!!
- Excellent effort

Question 4: How confident are you that this workshop will help Shires respond to coastal science and related government initiatives such as the Draft State Planning Policy 2.6 (State Coastal Planning Policy):

This question was answered by 25 respondents who rated on average a confidence level of 5.5 or good.

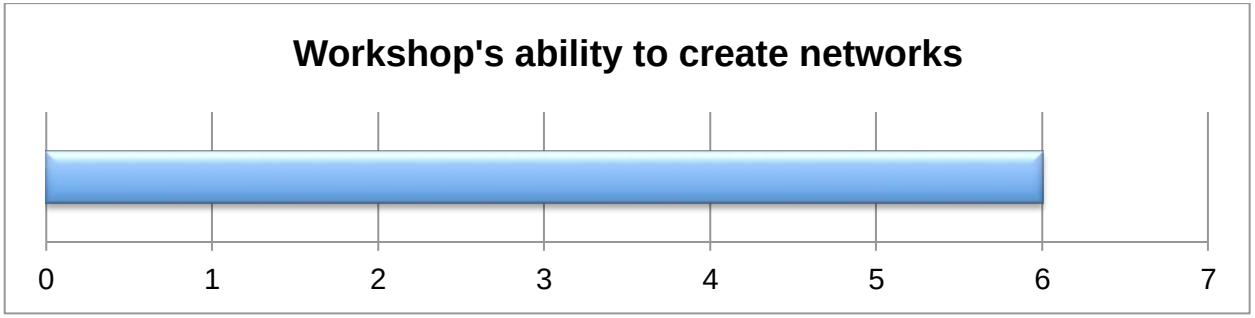


10 respondents gave additional comments:

- There are still legal gaps in process and policy.

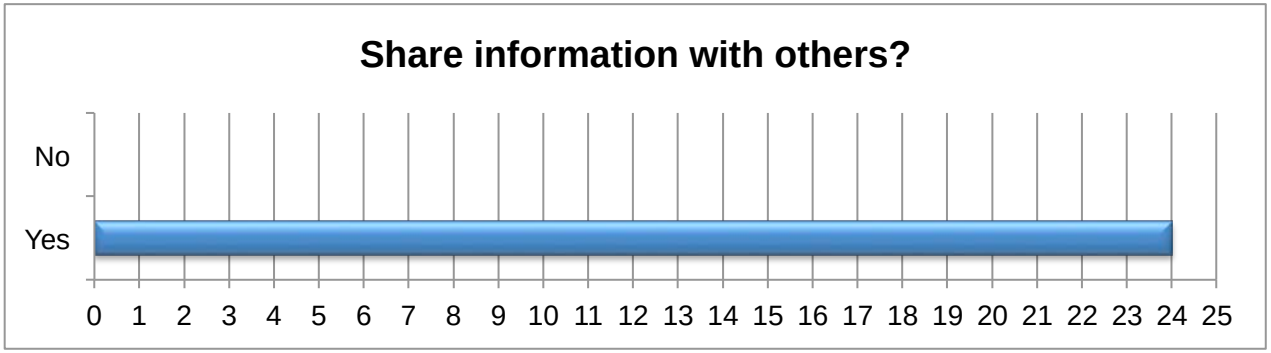
- Would like to see a shorter version of workshop so that it could be delivered to councils in a forum - say 2 hours.
- Has allowed me to understand s.pp.2.6
- Very good
- Relying on willingness of individuals to step forward.
- Staff and councillors are not competent
- Workshops such as these plus on-going workshops are essential to ensure local government is kept totally in the picture with latest knowledge and legal implications to ensure informed decision making.
- Will depend on developers greed.
- Need more policy learning.
- With other shires on the coast

Question 5: How do you rate this workshop's ability to create networks and partnerships for undertaking the next steps in the coastal hazard risk management process along the Gingin Dandaragan coastline?



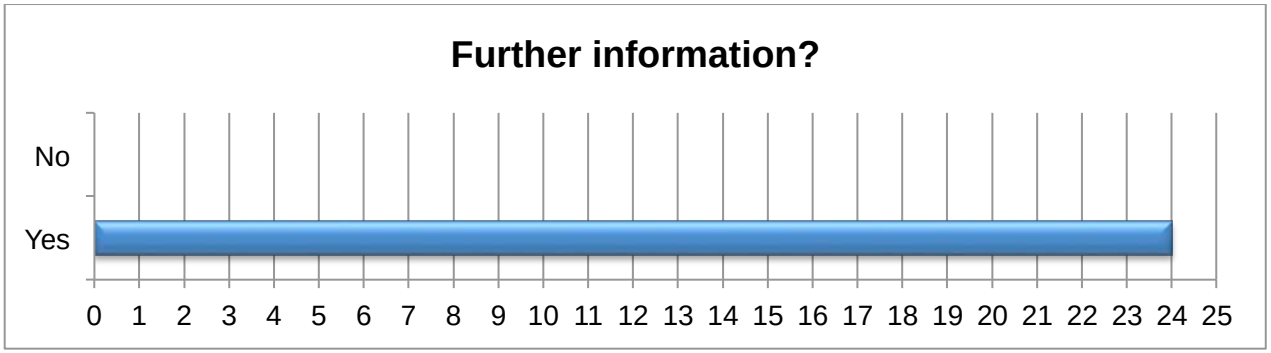
25 respondents answered this question and rated the workshop's ability as very good.

Question 6: Would you share information learned at this workshop with others?



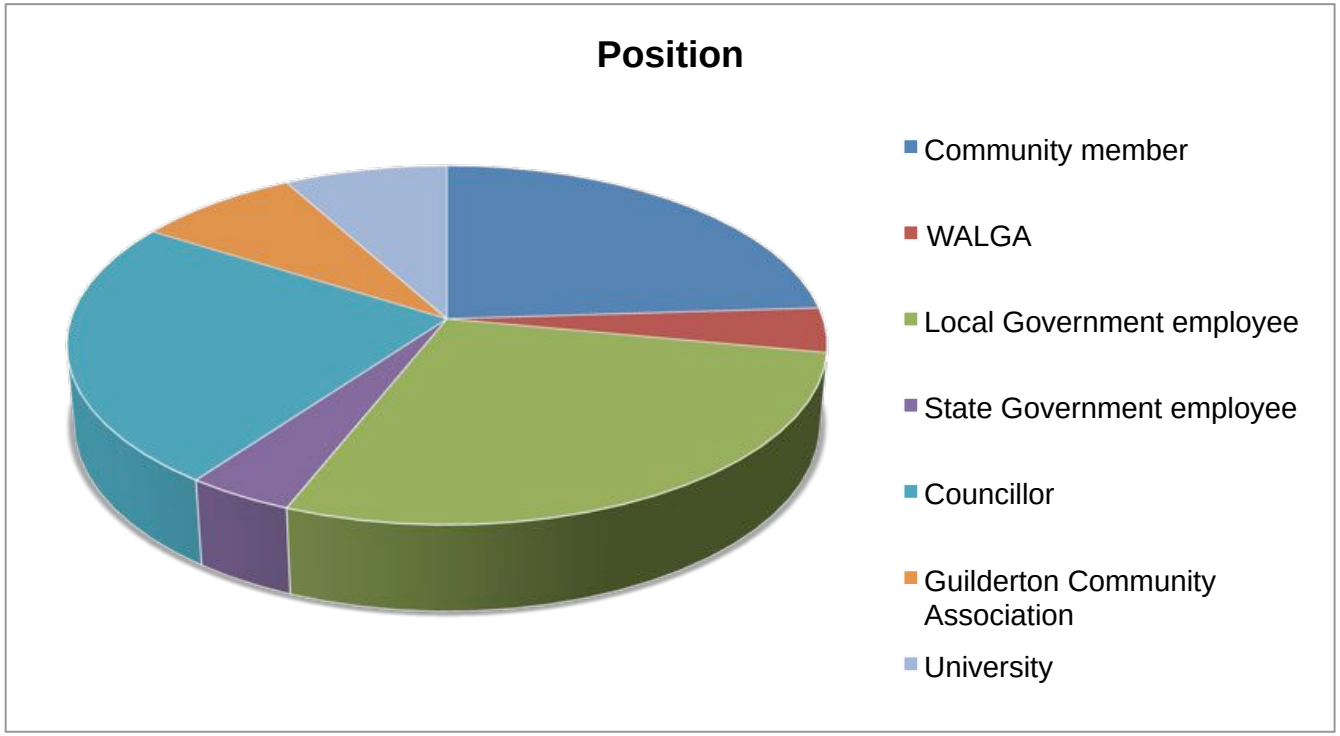
24 respondents answered this question and all answered yes.

Question 7: Would you like to receive further information and reference material relevant to coastal hazard risk management?



24 people answered this question and all answered yes.

Question 8: Please indicate the type of organisation you are representing today:



25 respondents answered this question. Six respondents identified themselves as community members. Sevens as Local government employees, six as councillors, one as a State Government employee, one as a WALGA representative, two as a Guilderton Community Association member and two as University representatives .

Question 9: Other comments?

12 respondents answered this question and their answers are depicted below.

- See what Wheatbelt Development Commission can offer, potential partnership? Well done?
- Really enjoyed the workshop. It certainly set the scene, would now like to see some follow up workshops on solutions, a brain storming exercise. Would also like to explore the option of Gingin + Dandaragan trying to develop a joint strategy - policy position on this.

- Great day, well done.
- Worth attending
- Excellent. Well done Ash and Mark.
- Would be good to facilitate more attendees.
- The outcome for coastal development does not look good. Sea level will not have to go up 900mm before a floodplain is created.
- Excellent programme
- Well done guys! A great first step.
- Would like a public information meeting for locals in their community.
- Would like to know if you guys have any information regarding boat launching facility for Ledge Point (Boat Ramp Proposal)
- Amalgamation of both shires into one would help communication on resources etc.

Conclusion

The Gingin Dandaragan Coastal Hazard Risk Management workshop was well attended by a cross section of representatives. Workshop participants indicated that they gained considerable knowledge A significant number of participants indicated they would share information with others and were keen to receive further info on coastal hazard risk management. The workshops were very successful in achieving the goals of community engagement and capacity building.

Photograph 2: Dr Malcolm Robb and Dr Michael Payne overseeing the Hill River Estuary, 5 April 2013, Jurien Bay (photograph: NACC)

Appendix G: Recommendations from the Information and Gap Analysis Report

The following recommendations are drawn from the findings of the Gap Analysis and informed by research and lessons learned from coastal hazard risk assessments undertaken in other regions.

Recommendation 1: That existing data sets are improved in order to develop second pass erosion and inundation hazard maps for the Hill Primary Compartment. The maps will identify areas that are likely to be more vulnerable to coastal erosion and/or inundation at different timeframes and climate change scenarios. Second pass assessments are generally undertaken for the entire coastal compartment (or sub compartments) as a 'first cut' to provide planners and managers with a basic level of information regarding potential impacts of hazards on natural and built coastal assets. In many cases these 'first or second pass' assessments identifies areas that require additional investigations. It is important to note that alone, broad scale assessments have limited value in areas where more robust information is needed regarding future risks to private and public assets, such as areas experiencing significant development pressures. However, these broad scale assessments help to prioritise and frame finer scale assessments at the local level by identifying compartments and sediment cells that are likely to be more vulnerable to coastal change over time. For this purpose the following project tasks are recommended:

I. **Coastal Sediment Cells Study** to identify sections of the coast that exhibit similar processes and morphology as the framework for estimating sediment budgets and local scale assessment of hazard and risk. Improved bathymetric data is a key requirement.
II. **Bathymetry Mapping Program** to identify priority locations for new bathymetric surveys for improved data on nearshore structures, behaviour and responses, sediment transport and sediment distribution on the seafloor and sediment cell classification. A LiDAR bathymetric survey for the entire compartment would provide a wider context for available bathymetric information and facilitate a more complete assessment of natural resources, including sediment availability and distribution, although a costly option. A cheaper option would be to collect Multibeam Hydrographic Surveys at priority areas. Older bathymetric charts can be validated with ground truth measurements (new bathymetries might not be required for certain sites).
III. **Regional Sediment Transport Model** specific to the Hill Primary Compartment to estimate sediment sources, sinks and key transport pathways and determine rates of coastal change.
IV. **Analysis of Historic Water Levels and Storm Surges Data** associated with historic extreme weather events and determine ARI events for the Hill Primary Compartment.
V. **Shoreline Change and Movement Plots Analysis** to assess historical shoreline change for the Hill Primary Compartment and help predict future coastal change.
VI. **Coastal Assets and Values Study** to gather information on coastal assets, uses and values that are potentially at threat from future coastal hazards and to identify areas of high vulnerability and high value.

Recommendation 2: That existing data sets are improved in order to undertake a 'third pass' erosion and inundation hazard assessment and mapping at priority areas. The priority areas will be identified from the Coastal Sediment Cells Study (I) and the Coastal Assets and Values Study (IV) projects. Site specific hazard and risk assessment will require the following projects:

VII. **Bathymetry Mapping Program** to generate high-resolution bathymetric charts at the tertiary sediment cell level at identified priority areas. This will improve data on nearshore structures, behaviour and responses, sediment transport and sediment distribution on the seafloor and sediment cell classification at identified priority areas.

VIII. **Additional Wave Buoys** for areas that require installation of temporary wave buoys for improved site-specific wave and current data.

IX. **Sediment Transport and Budgets Analysis** to estimate sediment sources, sinks and key transport pathways to determine the rate of coastal change at the tertiary level (key priority areas) and assess potential migration or retreat of unstable landforms.

X. **Geotech Investigations** to assess the elevation and coverage of underlying rock at priority sites.

XI. **Shoreline Movement Plots and Beach Profiles** to be extended to the whole compartment or at key priority areas for assessment of shoreline change and sediment budget calculation.

Recommendation 3: That on-going data collection programs are continued. Specifically, the following programs be maintained:

XII. **Beach monitoring program** (profiles, historic photos and community photo-monitoring) for assessment of shoreline change and sediment budget calculation and potential impact of engineered structures at identified priority areas.

XIII. **Sediment Sampling Program** for improved understanding of sediment transport pathways, sinks and supplies.

Table 8 (page 56 of this report) lists the recommendations for future data requirements for undertaking a hazard risk assessment and mapping at a scale useful for planning and management decision making.

Appendix H: Photos

Figure 6: Panel Discussion, Ledge Point Workshop. Photo – NACC.

Figure 7: Joanne presenting the PNP approach. Ledge Point Workshop. Photo – NACC.

Figure 8: Professor Garry Middle talking about legal implications for local governments. Photo – NACC.

Figure 9: Chiara Danese talking about coastal processes and the importance of understanding coastal dynamics. Photo – NACC.

Figure 10: Ledge Point Workshop, the attendees. Photo – NACC.

Appendix I: Workshop Power Point Presentations (PDFs)

COASTAL HAZARD RISK MANAGEMENT

Workshop

Shire of Gingin & Shire of Dandaragan

17th July 2013

Ledge Point, Western Australia

What is COASTAL HAZARD RISK MANAGEMENT?

A RISK MANAGEMENT process that considers COASTAL HAZARDS (erosion and inundation or flooding).

Main steps:

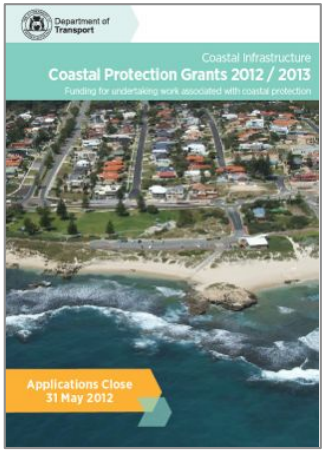
- **Identify coastal assets.**
- **Identify potential risk to coastal assets, caused by coastal processes (wind, waves, sea levels, storms, etc).**
- **Develop plans to mitigate and adapt to risks.**

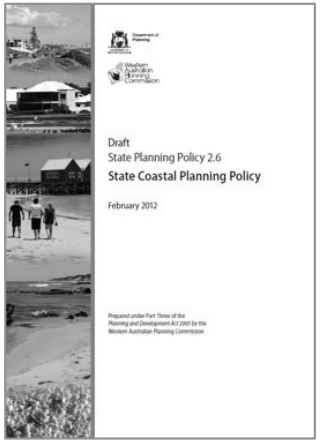
Coastal change at Lancelin (top) and Seabird (bottom)

Responding to GOVERNMENT INITIATIVES

Recent initiatives recognise risk that coastal communities face as a result of changing coastal processes (wind, storms, sea levels, etc). These initiatives encourage coastal managers to develop strategies for managing risk:

- **WA State Government (2010) - Sea Level Rise Position Statement**
- **WA Department of Transport (2013) - Coastal Adaptation and Protection Grants**
- **WA Department of Environmental & Conservation (2012) – Adapting to Our Changing Climate**
- **WA Department of Planning (2012) - Draft State Planning Policy 2.6 (State Coastal Planning Policy) – setbacks***





CAP Grants 2013 (top) and Draft SPP 2.6 (bottom)

AIM of the Gingin Dandaragan PROCESS

- Maximise resources by working together with a range of organisations to take the first steps of the Coastal Hazard Risk Management process.
- Take an integrated, informed and measured approach.
- With a longer term view to:
  - Identify coastal areas at risk;
  - Identify appropriate locations for future development and infrastructure;
  - Develop adaptation options for existing infrastructure.

FIRST STEPS in the PROCESS

- **Data and Information Gap Analysis - identify what data and information exists on local coastal processes (such as winds, waves, tides and water levels, currents, geology and geomorphology, sediment transport and budget, shoreline trends, etc) and future information requirements for coastal hazard risk management.**
- **Project Partner Workshop - help Shire staff, Councillors, community group representatives and project partners learn more about the risk management process and required next steps for the Gingin Dandaragan coast.**
- **Workshop Summary Report - summarise workshop outcomes and next steps to be undertaken by project partners.**

NACC'S ROLE?

- NACC is one of 54 regional NRM organisations funded by the Australian Government
- Facilitate integrated approaches to environmental planning and management
- Work with community, local and state government, educational institutions, and a range of other organisations to achieve this.

PROJECT PARTNER WORKSHOP

QUESTIONS?

nacc.com.au



Coastal Assets

Identifying assets at risk from coastal hazards.

Coastal Focus

Gingin-Dandaragan Coastal Hazard Risk Management Workshop – Ledge point 17/7/2013

Presenter: Chiara Danese

Introduction: Case Studies

- Cockburn Sound Coastal Alliance (WA)
  - Coastal vulnerability and Flexible Adaptation Pathways Project
  - 4 LGs (CSCA)
- Peron Naturaliste Partnership (WA)
  - Developing Flexible Adaptation Pathways for the Peron Naturaliste Coastal Region Project
  - 8 LGs (PNP)
- City of Clarence (TAS)
  - Clarence Climate Change Adaptation Pathways Project
  - 1 LG

Contents

- The coast: a dynamic environment
- Coastal Assets
  - What are they?
  - Why are important?
  - Potential impacts on coastal assets
- Identifying key asset areas, the CSCA Approach
- Next steps

The Coast: A dynamic environment

Coastal Erosion at Thirsty Point, Cervantes . Image: Paul Robb

Coastal Erosion at Thirsty Point, Cervantes. Image: Paul Robb

Coastal Erosion at Sunset Beach, Geraldton.

Dune Accretion, Geraldton Surf Club

Coastal Assets

Coastal Assets are: “Tangible features of the **built**, **natural** and **cultural** environment that deliver a set of goods and services. These goods and services provide benefits to people and can therefore be assessed for their **value to the community**” (adapted from CSCA)

Built Assets

- Residential and commercial buildings
- Holiday homes
- Ship terminals, ports and harbours
- Bridges, roads and paths
- Beach protection works (as groynes and jetties)
- Fishing piers and platforms
- Parks
- Surf clubs
- Boat access points
- Public infrastructure (showers, toilet facilities, viewing platforms)
- (and more..)

Important for:

- **Shelter**
- **Transport**
- **Sustenance (food and water)**
- **Access and Safety**
- **Education**
- **Jobs & industry**

= VALUE TO COMMUNITIES

Natural Assets

- Beaches
- Dunes
- Wetlands
- Seagrass
- Coral reefs
- Estuaries
- (and more..)

Important for:

- **visual amenity**
- **proximity to the coastline**
- **lifestyle choices**
- **indigenous, spiritual and cultural values and heritage**
- **habitat and nursery ground for many coastal and estuarine plants and animals**
- **buffer against storms**
- **filter for pollutants**
- **climate regulation**

= VALUE TO COMMUNITIES

Cultural Assets

- Grave sites
- Ruins
- Wrecks
- Meeting places

Important for:

- **Spiritual and cultural values**
- **Heritage**

= VALUE TO COMMUNITIES

Impacts on Coastal Assets

Population growth, urban development and changing coastal processes create increasing pressure on ‘coastal assets’ and the ‘services’ that these assets provide to our communities. This can result in:

- Permanent or temporary loss of the assets and services (and values) the asset provides
- Damage to the asset

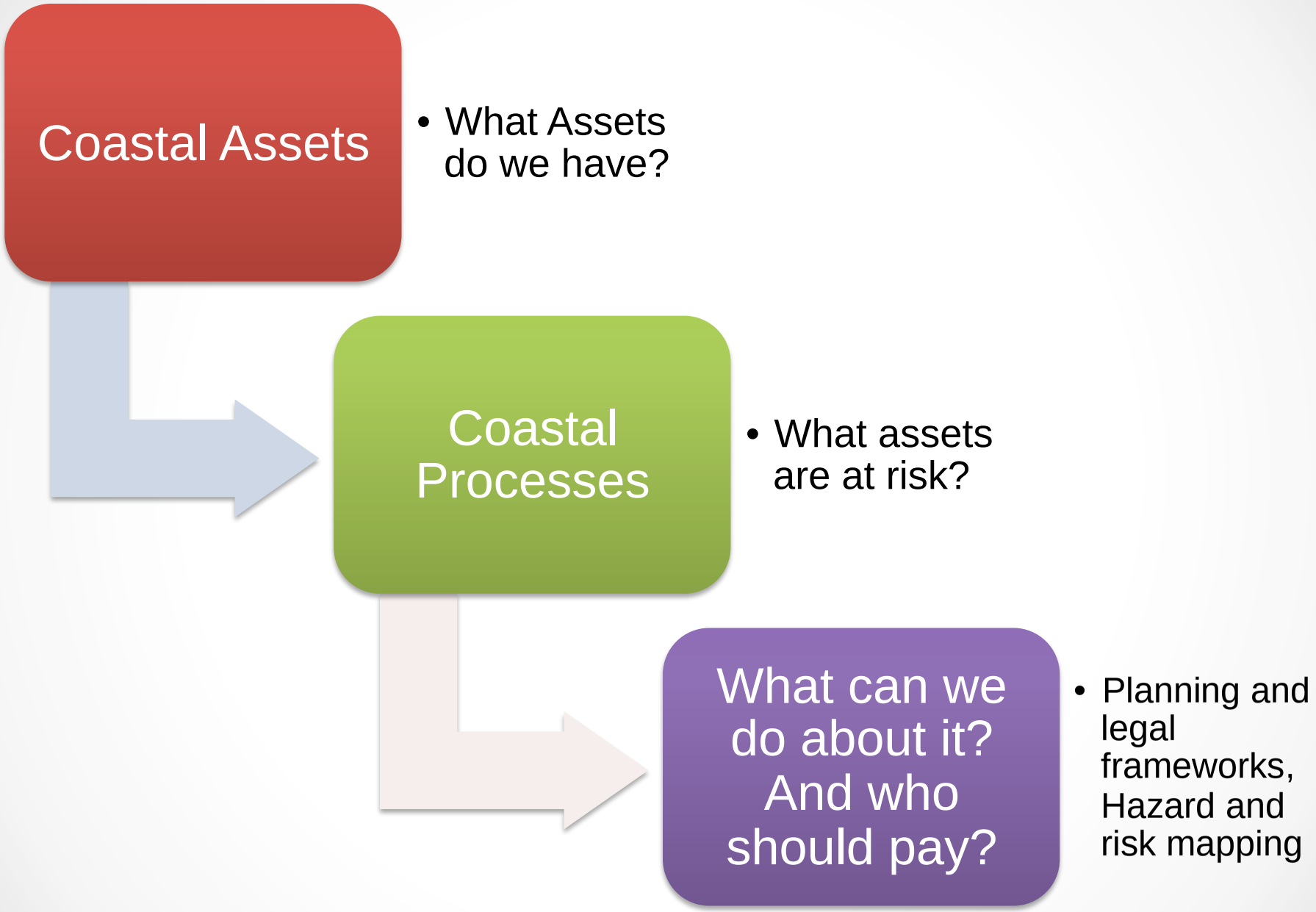
Australian Marine Complex - Henderson (City of Cockburn)

Assets along Cockburn Sound coast.

Coastal Erosion at Seabird. Image: NACC

Coastal Erosion at Lancelin. Image: Paul Robb

Coastal Erosion at Geraldton


Coastal Assets
• What Assets do we have?
Coastal Processes
• What assets are at risk?
What can we do about it? And who should pay?
• Planning and legal frameworks, Hazard and risk mapping

NEXT STEPS

1. IDENTIFY AND CATEGORISE ALL ASSETS AND VALUES WITHIN THE STUDY AREA

2. IDENTIFY COASTAL HAZARDS

IDENTIFYNG KEY ASSET AREAS: the CSCA Approach

- All assets along the study area:
  - What, where, how big, how categorised, who's is it
  - What service(s) does the asset provide, who are the beneficiaries
  - What value is derived from

- The information will be overlaid with risk assessment maps to identify what assets are, and are likely to be, at risk from coastal processes in the next 100 years

Table 4.5 Coastal Asset Categories and Items

Coastal Assets Categories and Asset items	
Parks, Beaches and open space	***Transport Infrastructure***
Beaches	Major (arterial) roads, bridges
Parks, Public open space / reserves	Local Roads, (including car parks)
Private recreational land (e.g. golf courses, football grounds, bowls clubs, tennis courts)	Railway systems
Wetlands / Forests / Other Habitats (including estuary entrances)	Jetties, wharves, boat ramps
Coastal Dune Systems	Harbours
Community Infrastructure	***Water and sewage infrastructure***
Surf Clubs	Stormwater outlets and pipes
Caravan Parks	Sewage Treatment Plants, sewage pumping stations, water supply networks
Heritage / Historic Sites and Significant Aboriginal Sites	***Residential Development***
Heritage Norfolk Island Pines	Existing Residences
Cycleway / Shared Pathway	Vacant Land (Future Development)
Ocean Pools	***Commercial and Industrial Development***
Community halls, libraries, other public buildings	***Institutional Infrastructure***
Amenities blocks, sheds, etc (Council facilities / assets)	Hospitals, Hospices
Lifeguard towers	Schools, child care facilities
	Aged care facilities

Questions?



Coastal Hazards

What hazards create risk to coastal assets?

Coastal Focus

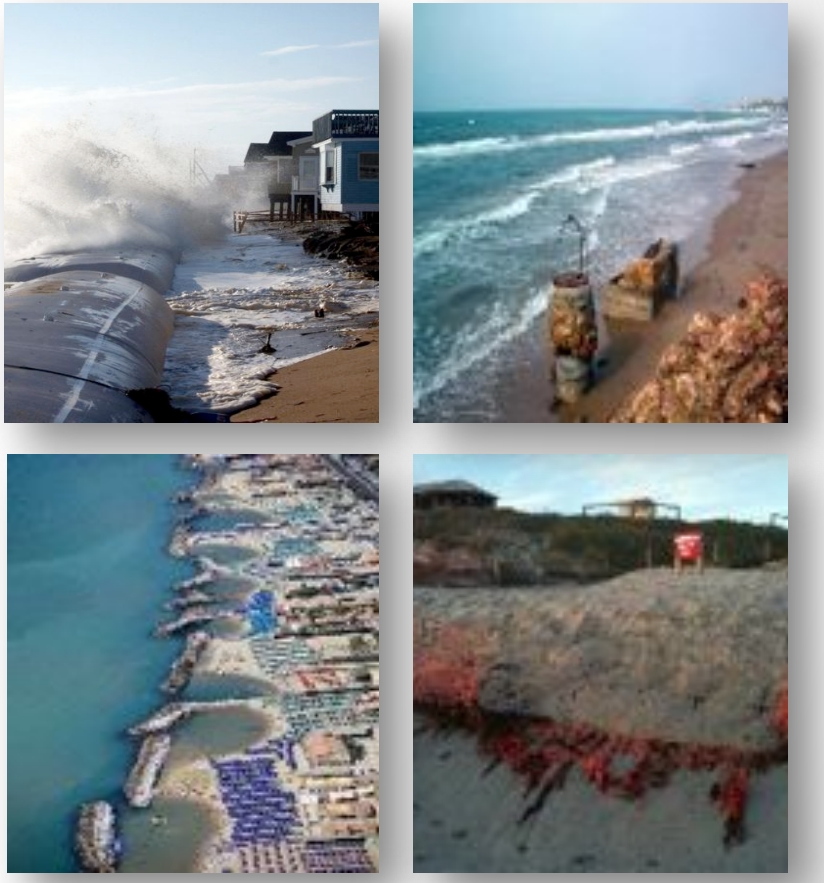
Gingin-Dandaragan Coastal Hazard Risk Management Workshop – Ledge point 17/7/2013
Presenter: Chiara Danese

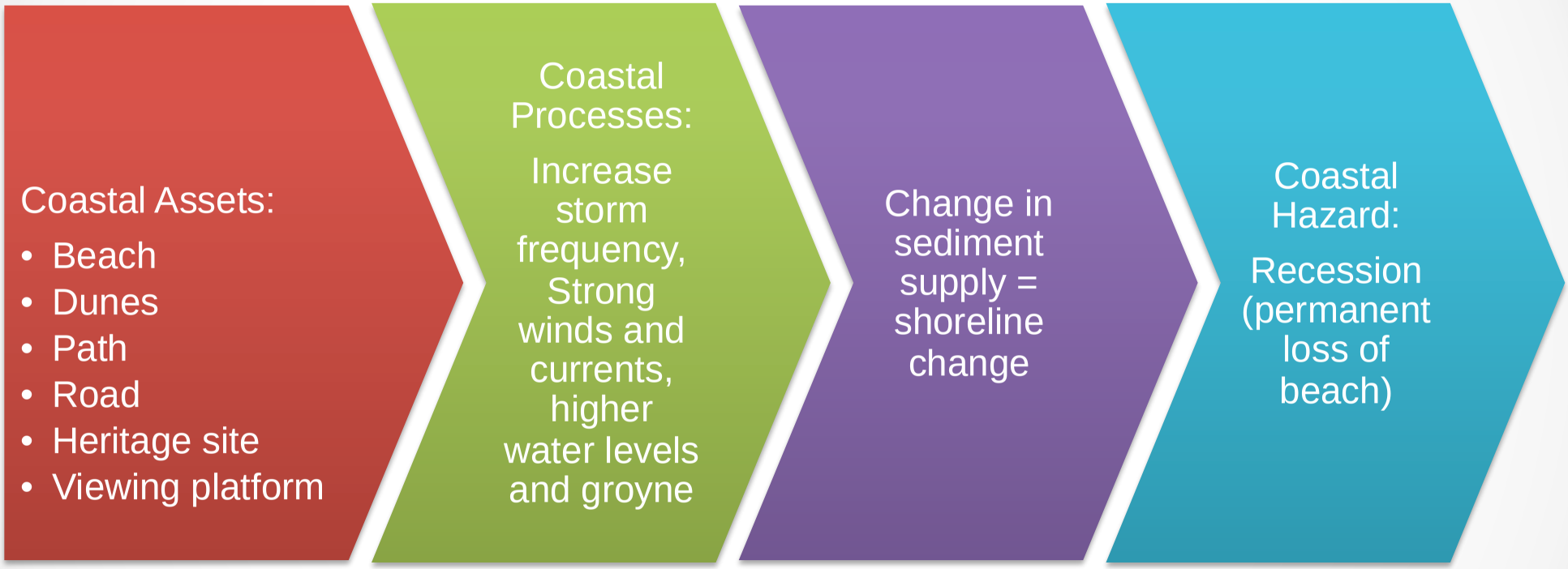
Contents

- Coastal Hazards
  - What are coastal hazards?
- What drives shoreline change?
  - Coastal Processes
  - Features of the Hill Primary Compartment
- Mapping coastal hazards

Coastal Hazards

- Coastal hazards occur when coastal processes pose a threat to things that human beings value (assets).
  - Coastal Inundation (flooding of low lying coastal land)
  - Coastal Erosion or recession
  - Salt water intrusion
  - Accretion




Coastal Assets:
• Beach
• Dunes
• Path
• Road
• Heritage site
• Viewing platform
Coastal Processes:
Increase storm frequency, Strong winds and currents, higher water levels and groyne
Change in sediment supply = shoreline change
Coastal Hazard:
Recession (permanent loss of beach)

Coastal Erosion/ Recession

- Coastal erosion occurs when waves and currents remove sand (temporarily or permanently) from the beach.
  - Interruption of sediment supply
  - Change in sediment transport (alongshore/crossshore)
- Shoreline erosion can be seasonal, chronic (coastal recession), or acute.

Cervantes – Image Paul Robb

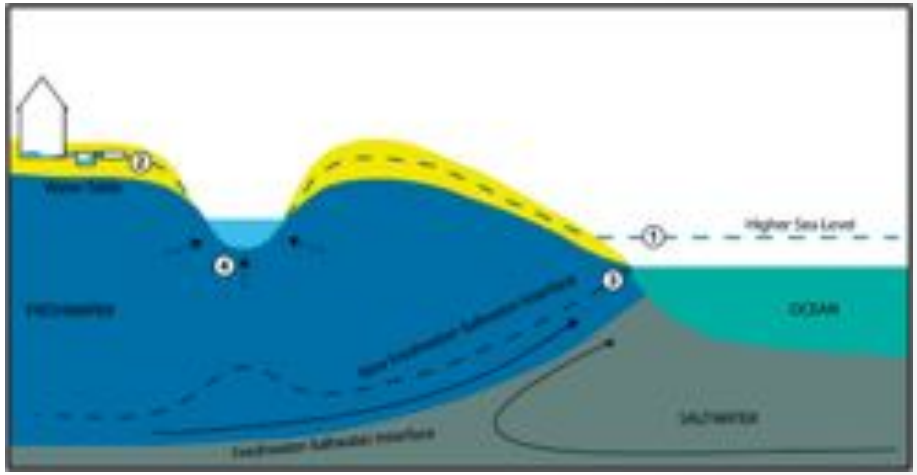
Coastal Inundation

- Inundation is commonly associated with severe storm events and is often the result of a number of combining factors including:
  - strong onshore winds
  - low barometric pressure
  - high astronomical tides
  - wave set-up
  - wave run-up
  - increased sea levels

Goald Coast - Image Greg Stuart

Salt water intrusion

- Increases in sea level have the potential to raise the fresh water table and contaminate groundwater supplies due to landward and upward movement of seawater in coastal aquifers (migration of the transition zone).



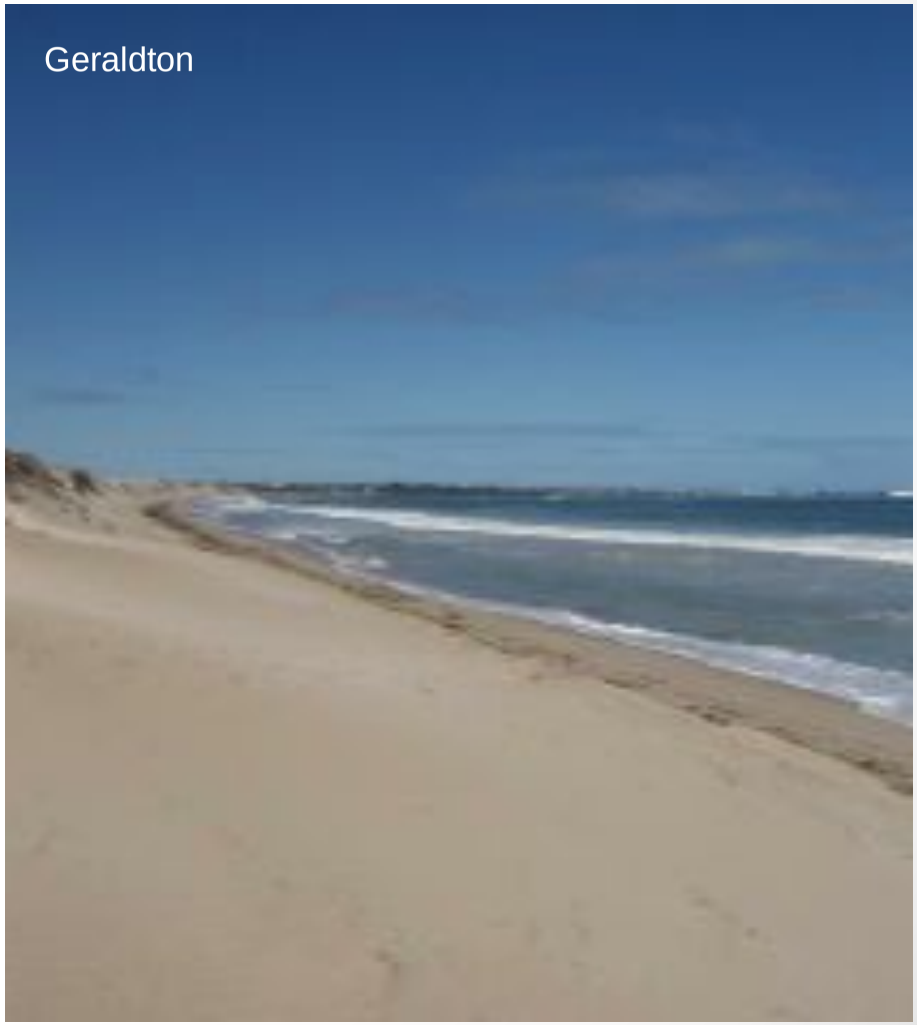
Coastal Processes

- Atmospheric forces (winds, storms, rainfalls, pressure gradients, ocean temperatures, weather patterns such as La Nina and El Nino)
- Oceanic forces (water levels, currents, waves, oscillations of sea levels, Tsunami events)
- Geology (which forms the structure of the coastal zone) and geomorphology (which is both a product of coastal processes as well as affecting processes) – sediment budgets and bedrock
- Engineered structures

What drives shoreline change?

Sandy and rocky shorelines can respond differently to coastal processes.

Coastal Processes (cont)

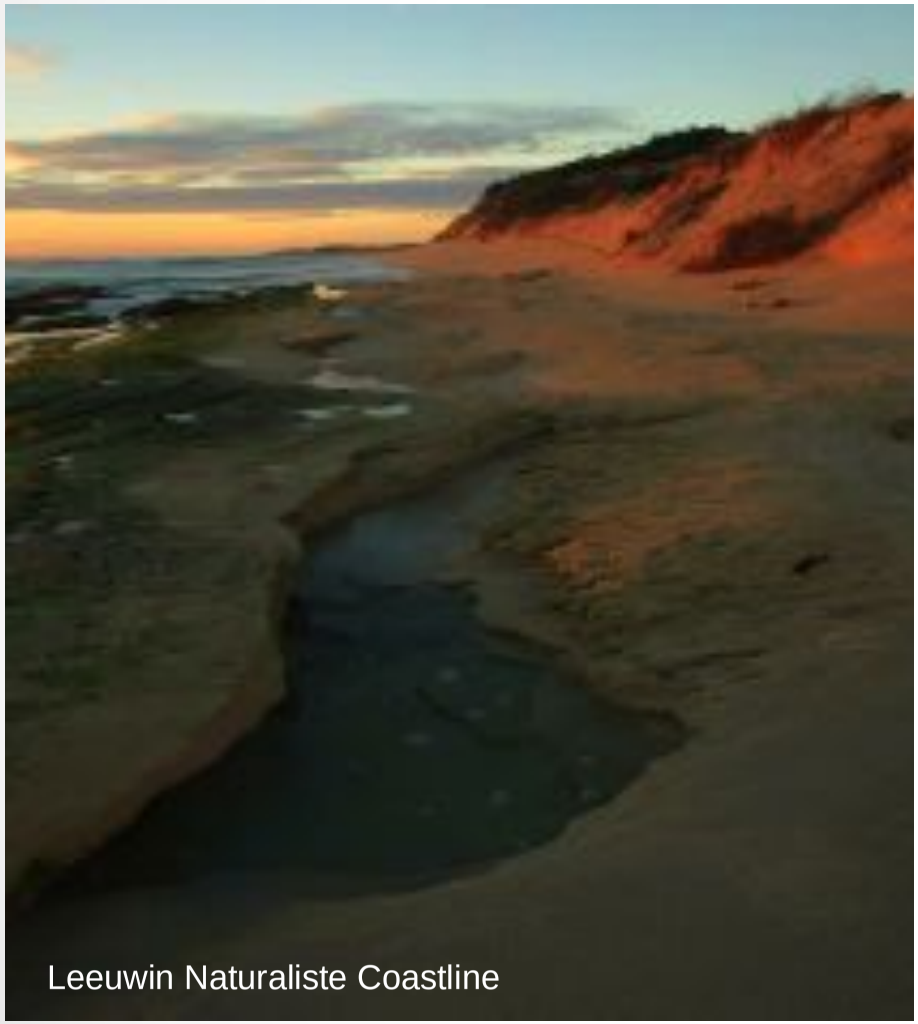


Coastal Processes (cont.)

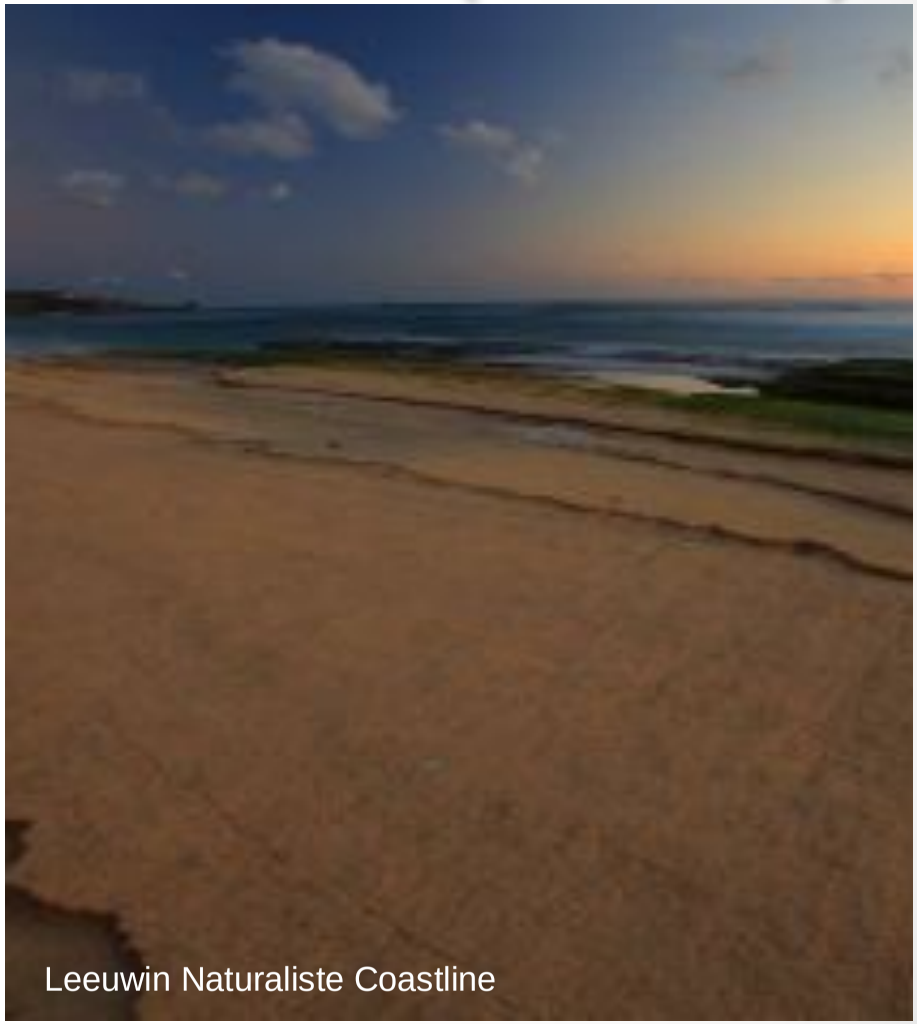

Green Head


Denmark

Coastal Processes (cont.)

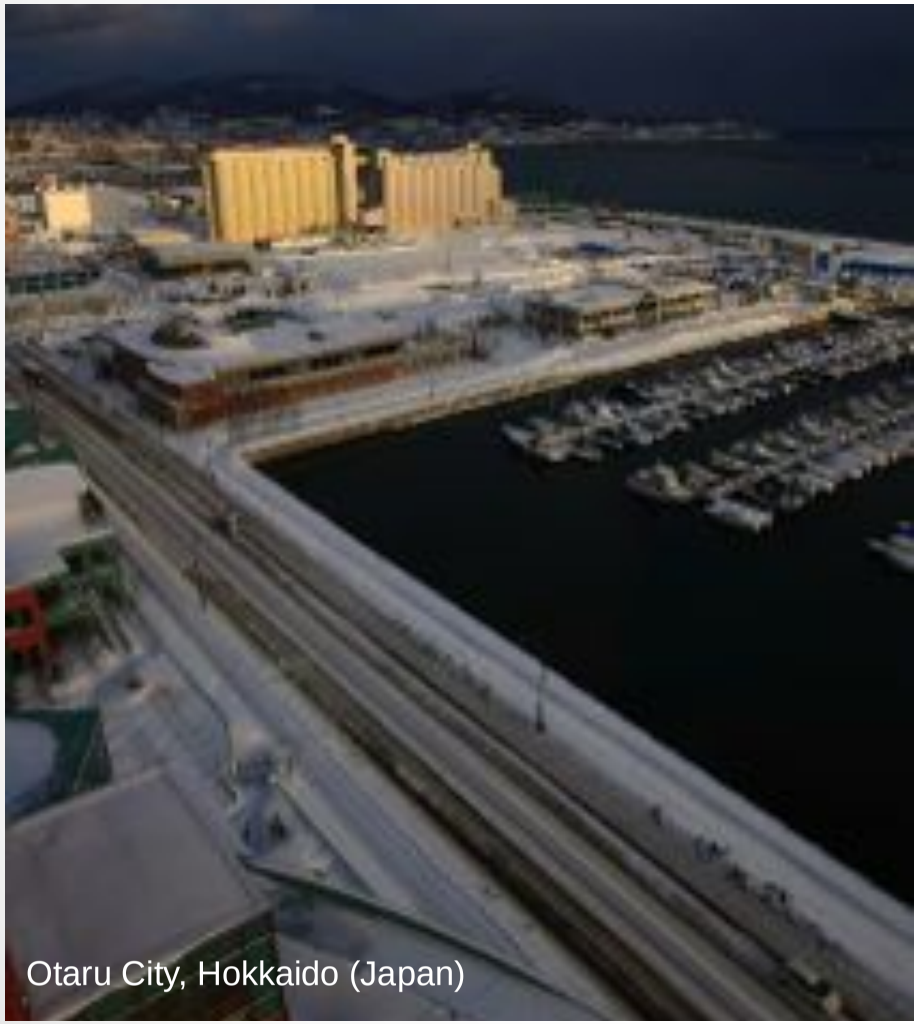


Leeuwin Naturaliste Coastline



Leeuwin Naturaliste Coastline

Coastal Processes (cont.)



Otaru City, Hokkaido (Japan)

Marina di Pisa (Italy)-
Image Enzo Pranzini

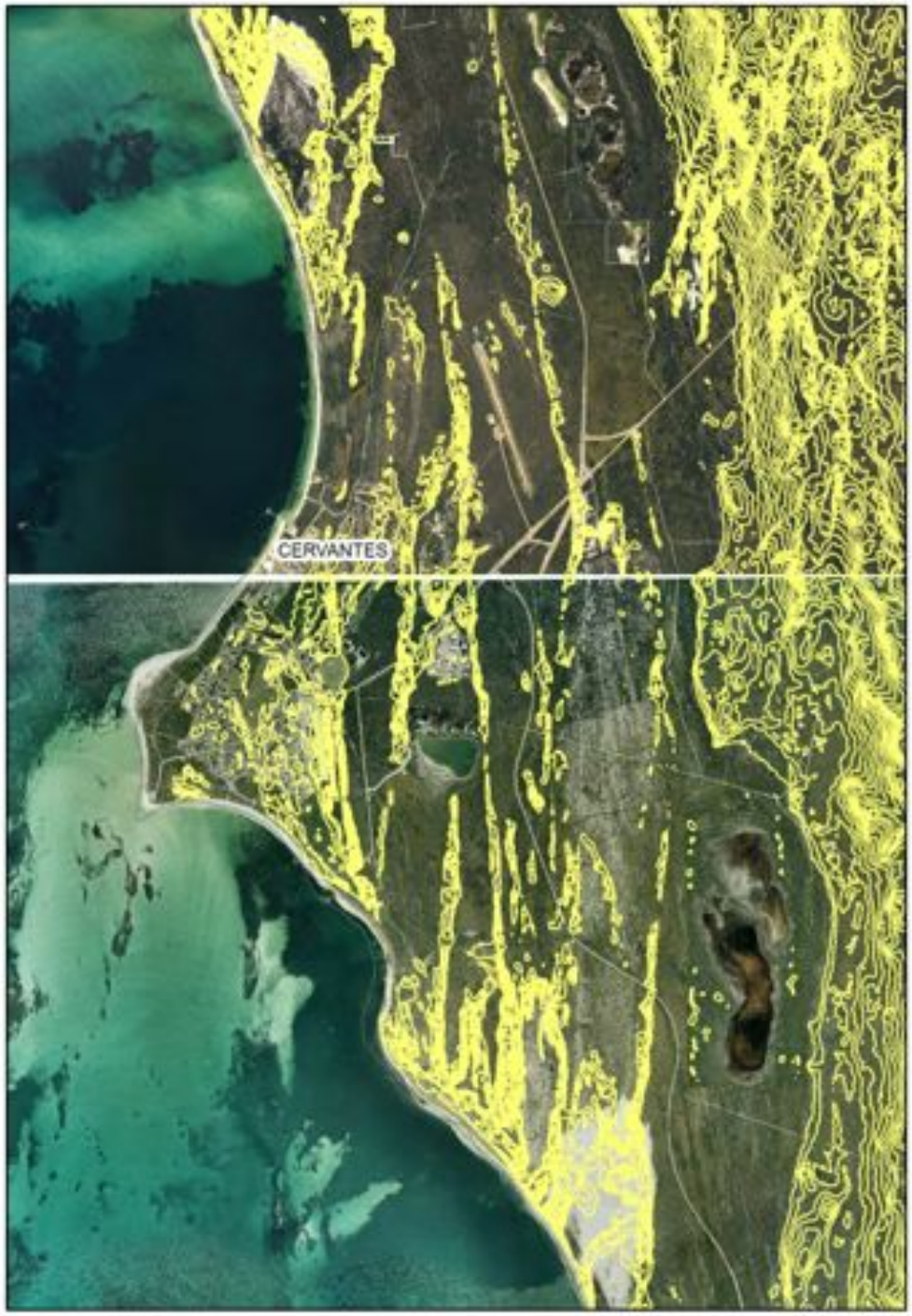
Features of the Hill Coastal Compartment

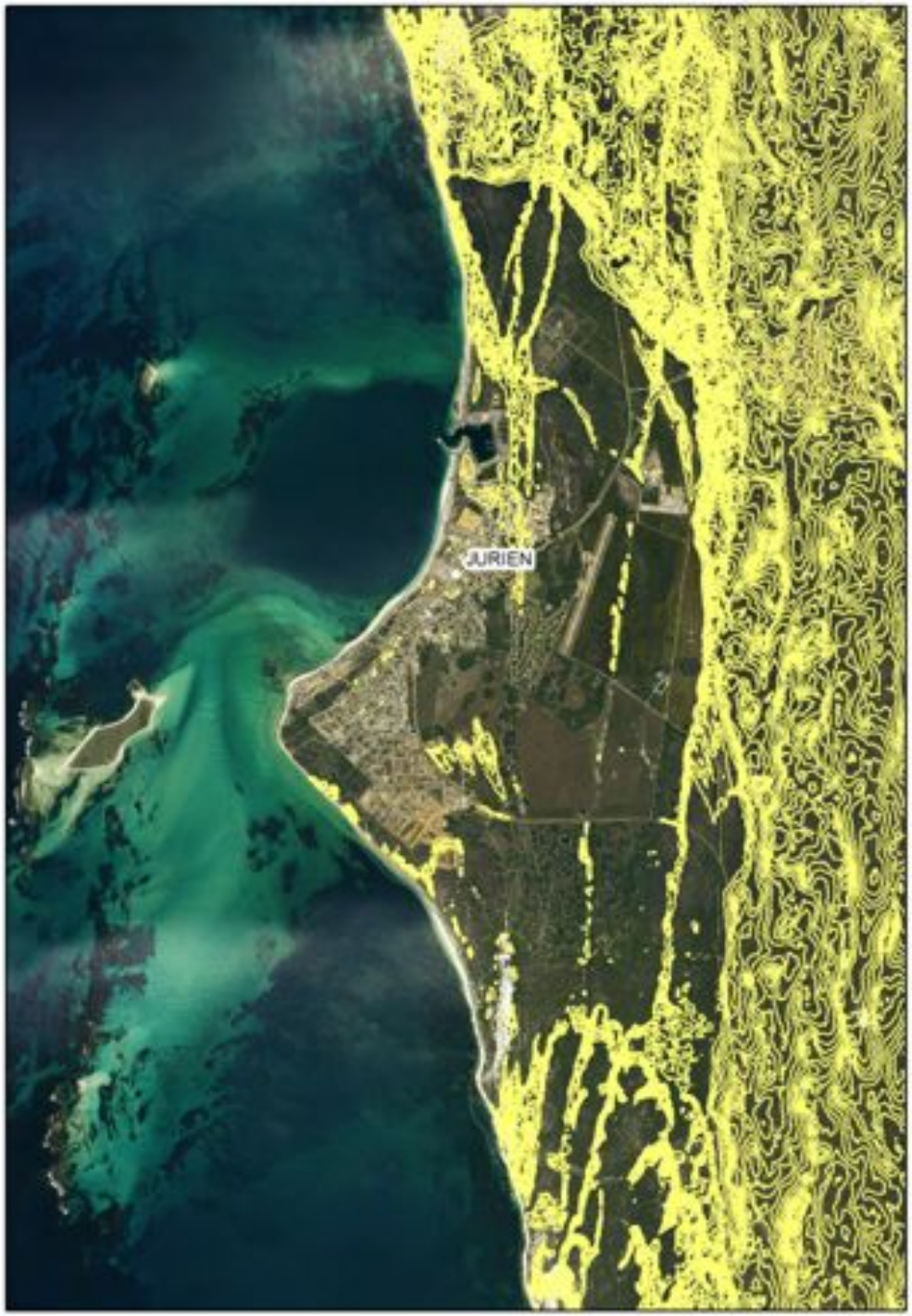
- Low lying sandy coast
- Protected by offshore reefs and islands
- Vulnerable to coastal change

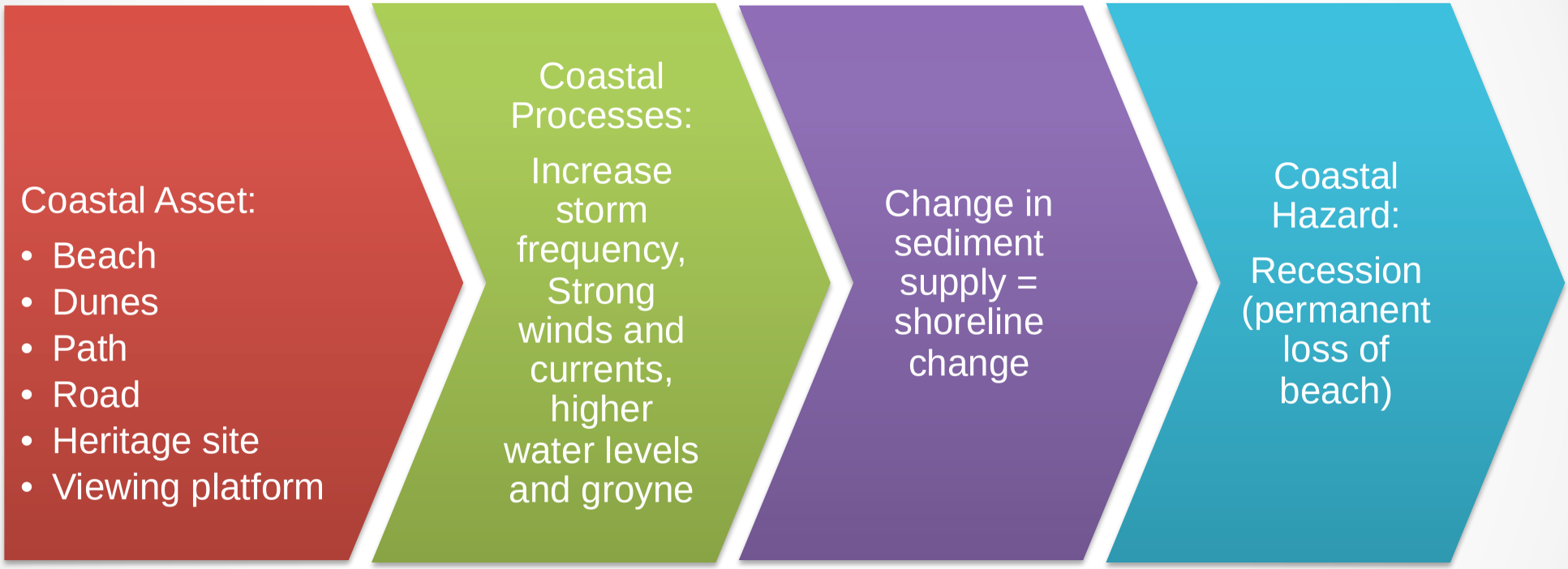
Located within the Hill Primary Coastal Compartment, Cervantes typifies the landforms of this coastal stretch.


LANCELIN


LEDGE POINT


CERVANTES


JURIEN


Coastal Asset:
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Coastal Processes:
Increase storm frequency, Strong winds and currents, higher water levels and groyne
Change in sediment supply = shoreline change
Coastal Hazard:
Recession (permanent loss of beach)

✔ ?? ??

Vulnerability Maps

Damara WA Pty Ltd

Table 5-6: Susceptibility, Instability and Vulnerability Rankings for Each Cell

Cell	Southern Boundary of Cell	Susceptibility Rank	Instability Rank	Vulnerability Rank
36	South Fisherman	L	L	L
35	Sandy Point	M	L	L-M
34	Sandland	M	M	M
33	North Head	M	M	M
32	Pumpkin Hollow	L	L	L
31	Middle Head	L	M	L-M
30	Island Point	M	M	M
29	South Booka Valley	H	M	M-H
28	South Hill River	M	H	M-H
27	Black Head	L	M	L-M
26	Thirsty Point	M	M	M
25	Hansen Head	M	M	M
24	Kangaroo Point	M	M	M
23	Boggy Bay	M	M	M
22	Grey	M	M	M
21	South Grey	L	M	L-M
20	North Wedge	L	M	L-M
19	Wedge Island	M	H	M-H
18	Magic Reef	H	M	M-H
17	Narrow Neck	M	M	M
16	Ride Point	L	M	L-M
15	Lancelin Island	H	M	M-H
14	Edward Island	M	M	M
13	South Pacific Reef	M	M	M
12	Ledge Point	M	M	M
11	Green Reef	M	M	M
10	Manakoora Sand Patch	M	H	M-H
9	South First Bluff	M	M	M
8	Second Bluff	L	M	L-M
7	Eagles Nest Bluff	L	L	L
6	Seabird	M	M	M
5	Moore River	M	M	M
4	South Moore River	L	M	L-M
3	North Two Rocks	L	M	L-M
2	Two Rocks	L	M	L-M
1	Wreck Point	L	L	L

Key	Vulnerability of environmental change	Implications for development (see Table 2-11 for further description)
	Low	Coastal risk is unlikely to be a constraint to development
	Low-to-moderate	Coastal risk may present a low constraint to development
	Moderate	Coastal risk may present a moderate constraint to development
	Moderate-to-high	Coastal risk is likely to be a significant constraint to development
	High	Coastal risk is a highly significant constraint to development

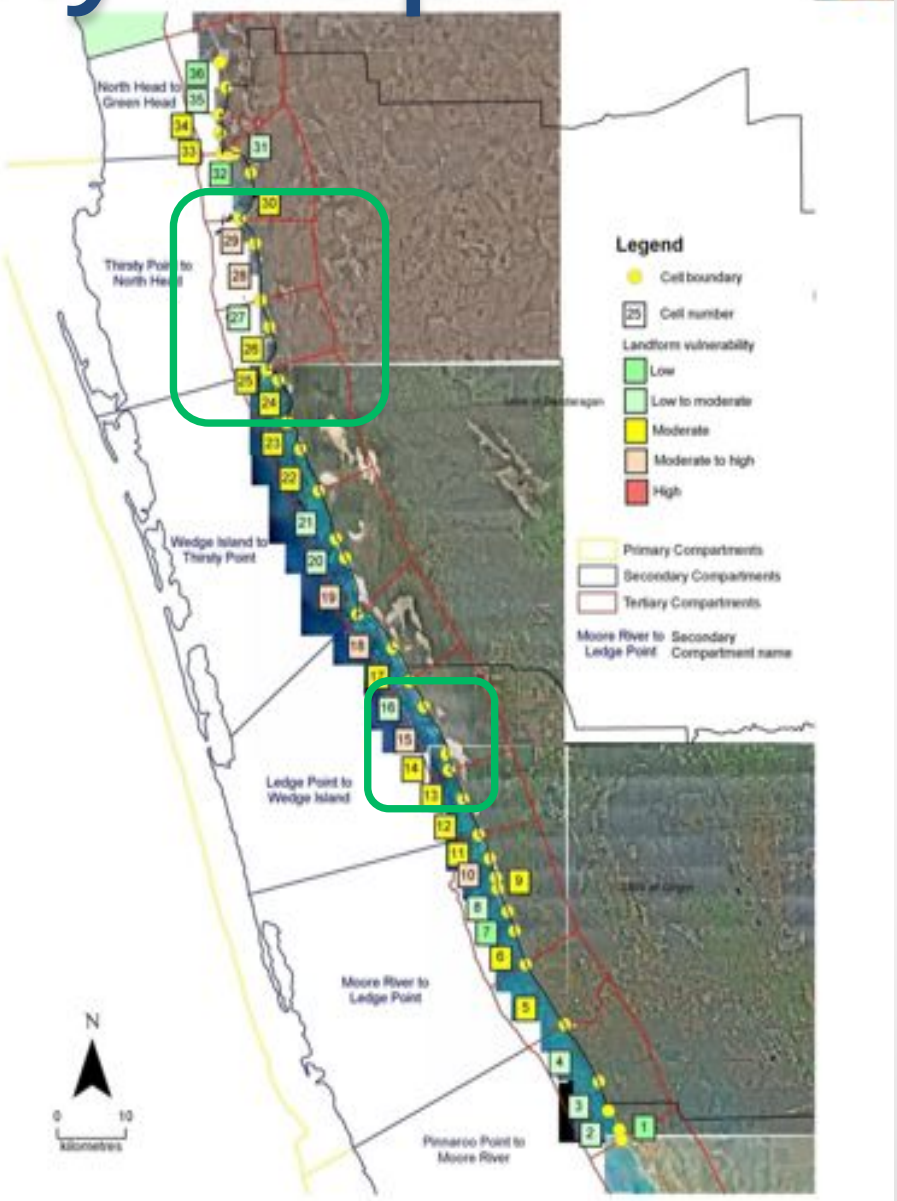
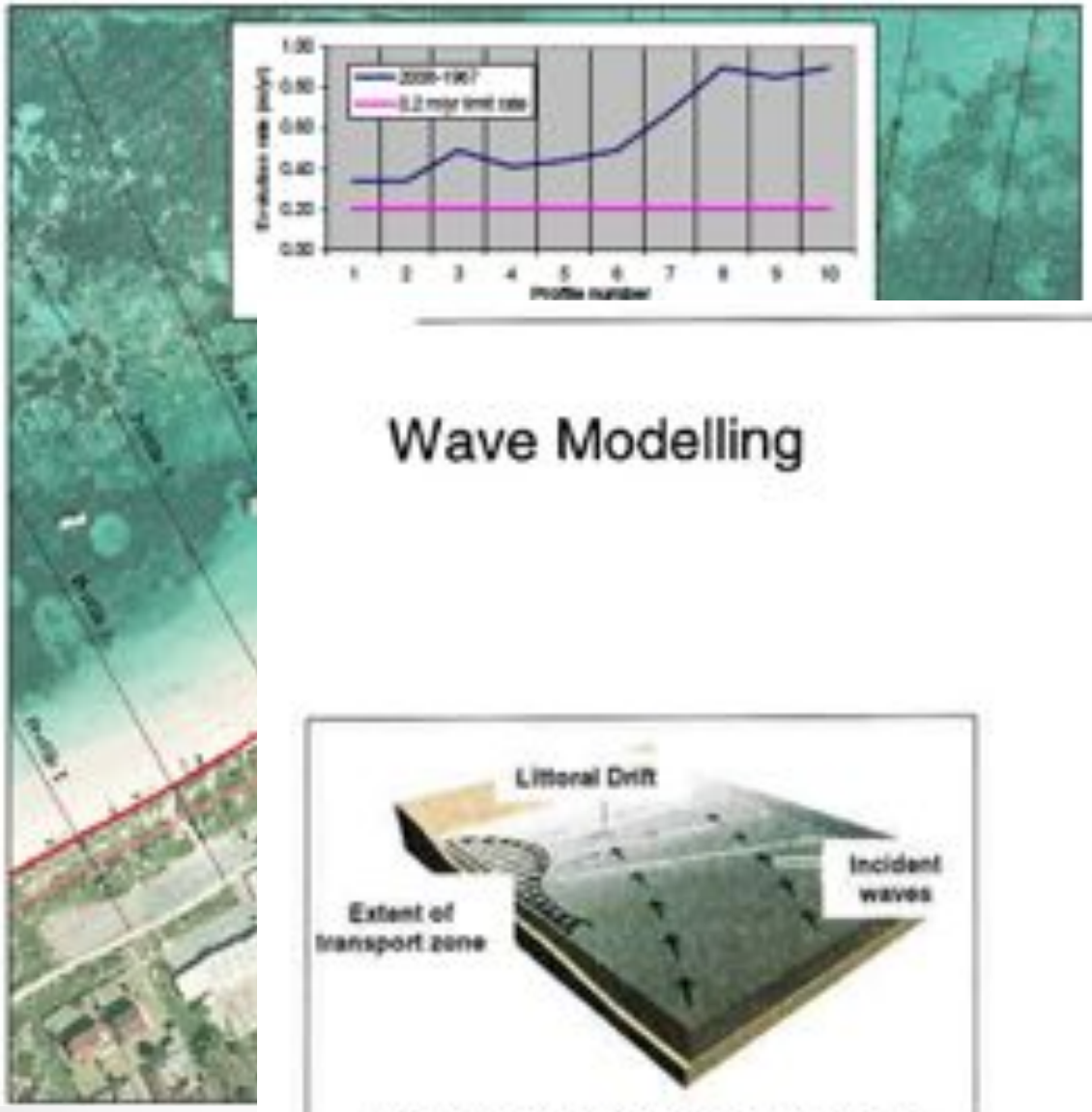
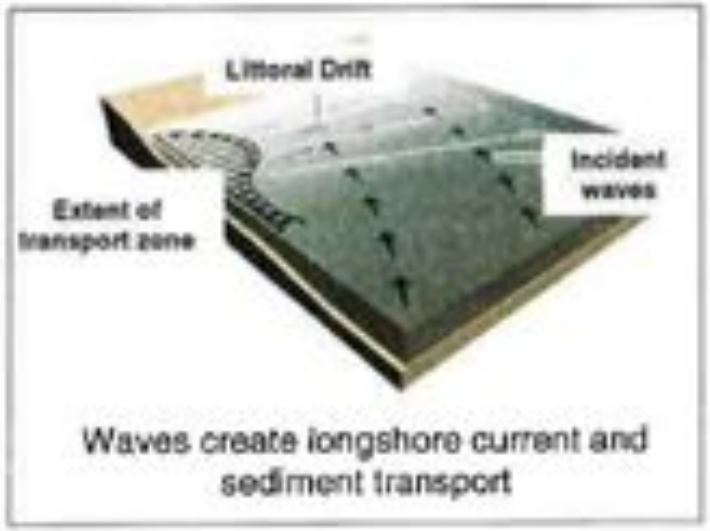


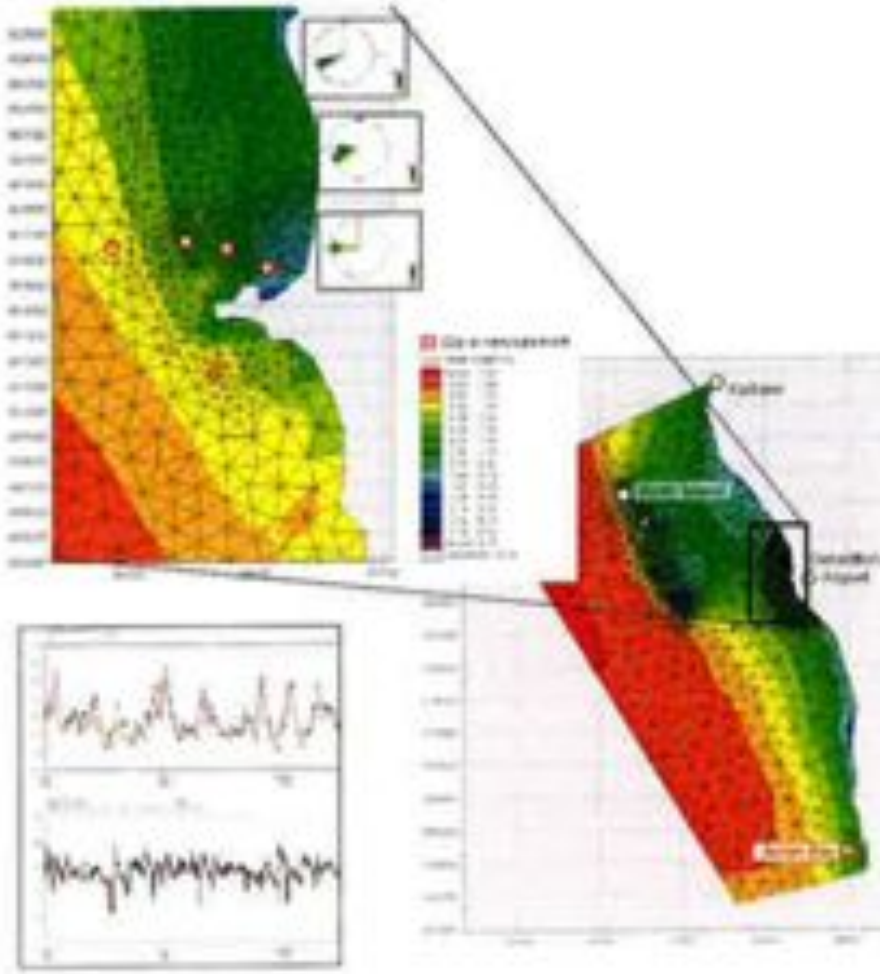
Figure 5-1: Vulnerability Rankings for the Gingin-Dandaragan Coast



Wave Modelling



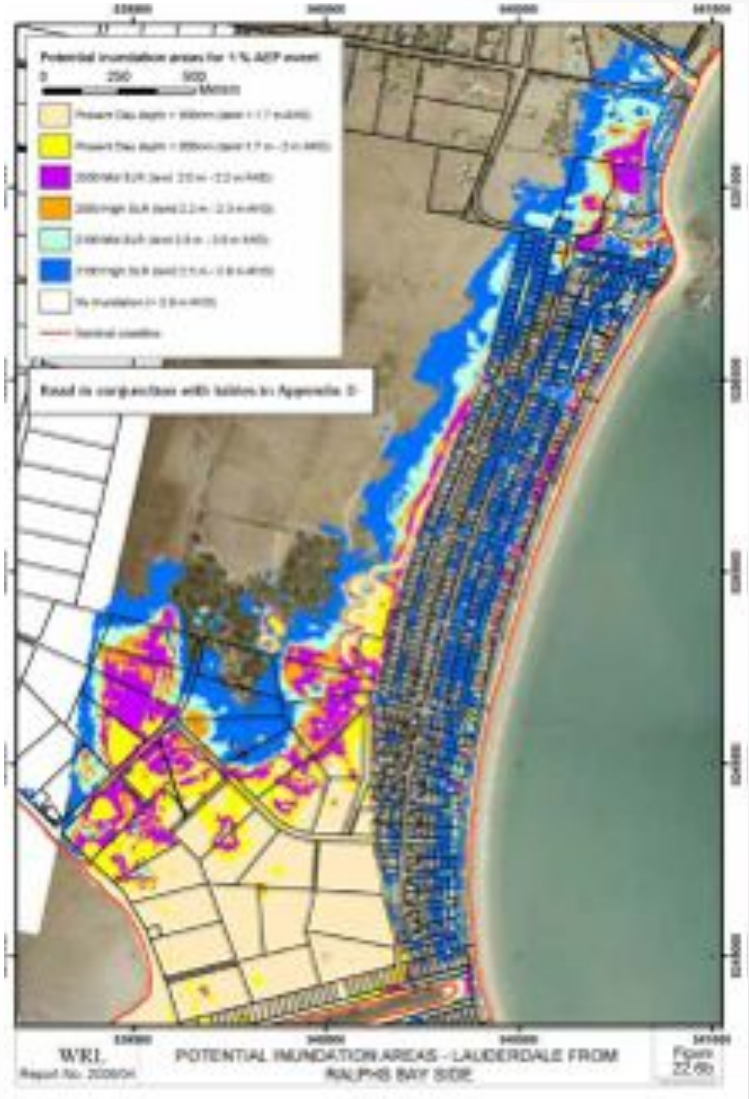
Waves create longshore current and sediment transport



Hazards Maps

Coastal Erosion Maps

Coastal Inundation Maps



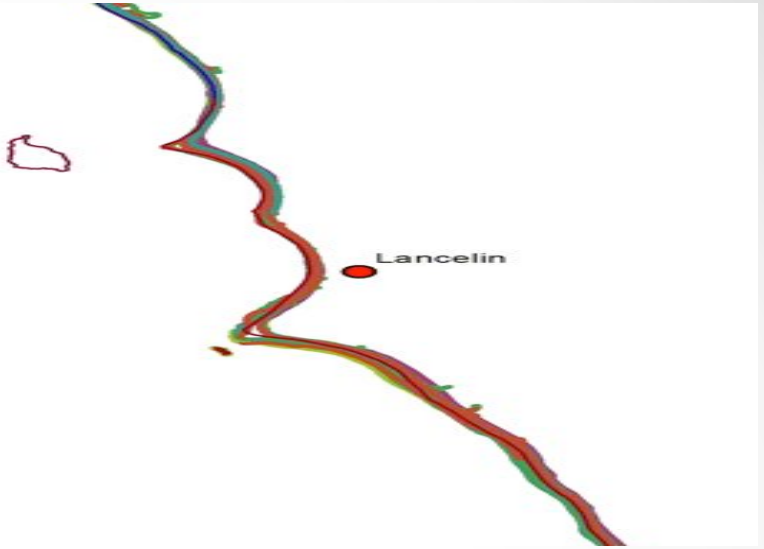
Hazards Maps

(just to name a few)

- Peron Naturalist Region(WA)
- Cottesloe (WA)
- Cockburn Sound (WA)
- Sydney Coastal Councils (NSW)
- City of Clarence (TAS)
- Port Phillip Bay (VIC)
- Townsville (QLD)
- Coffs Harbour (NSW)
- Wollongong (NSW)

Next Presentation..

- What data & information is needed to understand coastal processes and develop hazards maps at the regional and local scale?



Coastal Datasets

What datasets are needed to understand local coastal processes and assess risks?

Coastal Focus

Gingin-Dandaragan Coastal Hazard Risk Management Workshop –
Ledge point 17/7/2013
Presenter: Chiara Danese

Contents

- Coastal Data & Information
  - Hazard mapping: scale
  - Coastal data & information
  - Gaps in existing data sets
  - Recommendations for future studies

Hazard Mapping

The level of accuracy and robustness of recession lines depends on data availability and its usefulness.

Broad Scale Hazard Mapping

Broad scale assessments

- As a ‘first cut’ to provide planners and managers with a basic level of information regarding potential impacts of hazards on natural and built coastal assets.
- To identify areas that require additional investigations.

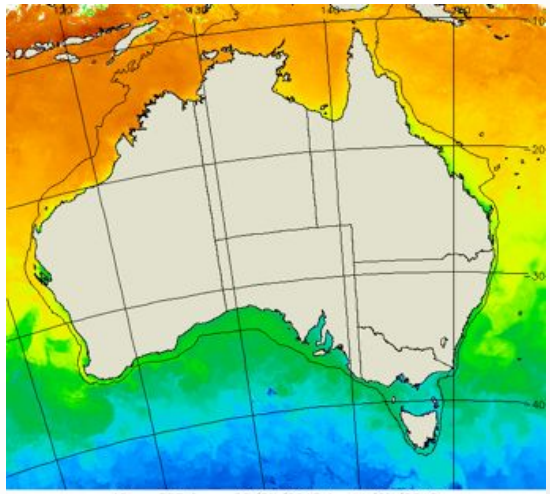
Site specific Hazard Mapping

- It provides enough detail for land-use planning decisions such as setback lines and distances and areas subject to coastal inundation.
- High value areas, urban areas, future development

Coastal Data

- Meteo-Ocean Drivers
  - Winds
  - Rainfall
  - Storm events
  - Air temperature
  - Water levels (water levels, mean sea levels, seiches, surges and tides)
  - Currents
  - Offshore and Nearshore Wave Data
  - Ocean temperatures

- Collected by:
  - BoM
  - CSIRO
  - DoT
  - DoW
- Useful for:
  - Variations in sea levels
  - Weather patterns
  - Likelihood storm events



Coastal Data

- Geology
- Geomorphology
  - Location of bedrock
  - Landforms
  - Topography
  - Coastal Features (tombolos, cuspate foreland, reefs, islands)
  - Sediments

- Collected by:
  - Universities
  - Geological Survey WA
  - Dept. Planning
- Useful for:
  - Sediment transport
  - Sand availability
  - Shoreline change

Coastal Data

- Sediment Transport and Sediment studies
  - Sediment characteristics
  - Sediment budgets

- Collected by:
  - Dept. of Transport
  - Universities
  - Ports

- Useful for:
  - Shoreline change
  - Sediment supplies
  - Sediment budgets (sinks, sources and pathways)

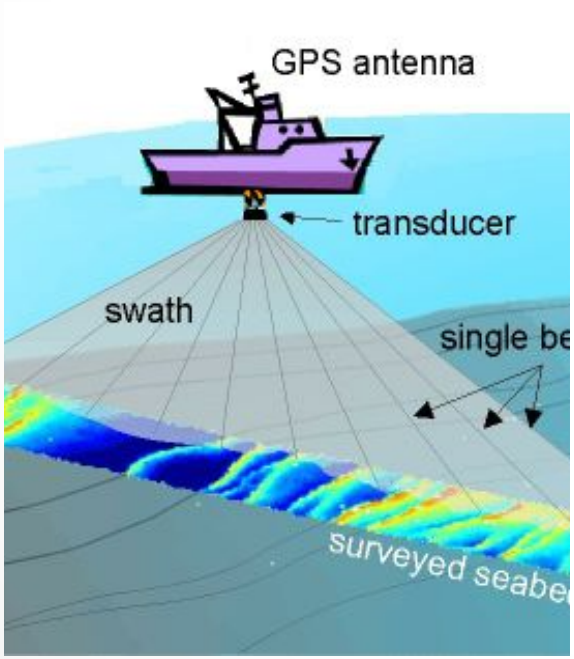
Coastal Data

- Hydrology
- Groundwater

- Collected by:
  - Dept. of Water
  - Geoscience Australia
- Useful for:
  - Flood levels, Discharges
  - Height and location of groundwater = sediment transport

Coastal data & information

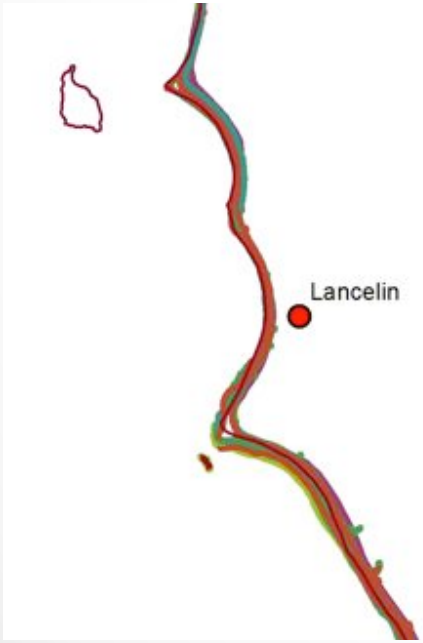
- Hydrographic Surveys: Bathymetries and Beach Profiles



- Collected by:
  - Dept. Transport
  - Part of dredging projects, port construction, etc.
  - Universities
- Useful for:
  - Sea floor topography
  - Water depths
  - Marine features
  - Sediment budgets
  - Shoreline change
  - Update nautical charts

Coastal data & information

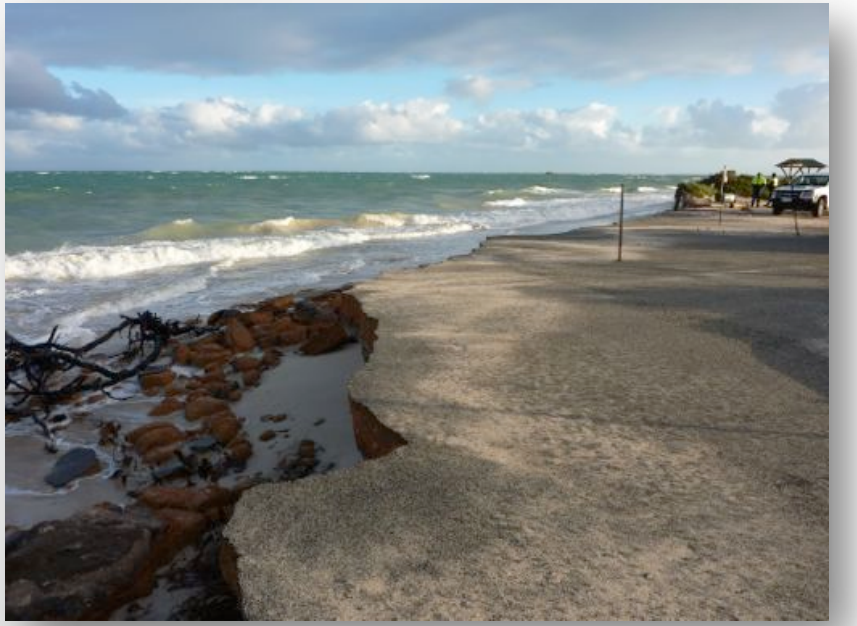
- Shoreline Movement Plots
  - Plotting historical vegetation lines from aerial photography



- Collected by:
  - Dept. Transport
  - Universities
- Useful for:
  - Understanding long-term shoreline change
  - Estimate shoreline movement trends

Coastal data & information

- Aerial Photographs and Site Photos



- Collected by:
  - Landgate (Aerial photos)
  - Dept transport and LGs (site photos)
  - NACC (Community Beach Monitoring Program)
  - Nearmap (aerial photos)
- Useful for:
  - Shoreline change
  - Damage to infrastructure
  - Changes in landforms

Coastal data & information

- Condition Assessment of Engineering Structures

- Collected by:
  - Dept. Transport
  - LGs?
- Useful for:
  - Damage to infrastructure
  - Effectiveness
  - Maintenance programs

Existing Data & Information: Meteo-Ocean Drivers

- ***Water Levels (Tide Gauges 1897-present day)*** Fremantle, Geraldton, Jurien Bay, Hillarys, Lancelin and Two Rocks.
- ***Offshore and nearshore wave (wave buoys - 1977 to present day)*** Rottnest, Geraldton; Jurien Bay (from 1997 digital format)
- ***AWAC (Short term deployments, waves and currents nearshore, 2003-2004)*** Seabird and Ledge Point and Guilderton.
- ***Winds, Rainfall & Temperatures (1965 to present day)*** Jurien Bay and Lancelin

Existing data & information: Geology & Geomorphology

- Geological maps (1930 to date)
- GSWA Coast digital datasets (Gozzard, 2011)
- Gingin-Dandaragan Vulnerability Report (Eliot et al. 2011)
- Geotechnical Assessments for North Head and Seabird
- Topography – detailed contours

Existing data and information:

Sediment Transport & Sedimentology

- GSAW Coast digital datasets
- Vulnerability and Sediment Cells report
- A few sediment samples have been taken as part of site specific assessment often associated with dredging projects and construction of jetties or groynes. Most in Lancelin.

Existing data and information: Engineered Structures

- Specs included in dredging projects and construction of ports
- No condition assessment kept by LGs

- Breakwaters: Jurien Bay
- Groynes: Ledge Point and Guilderton
- Boat ramps: Seabird
- Jetties: Lancelin, Cervantes, Jurien

Existing Data & Information: Hydrographic Surveys & Beach Profiles

(DoT) Single beam surveys and beach levels over the last few decades for each coastal town in the study ad hoc (-6 to -10 m offshore)

Nautical charts are also available

Only a few beach profiles have been produced for the study area. Those available extend from the dune crest to -10m water depth.

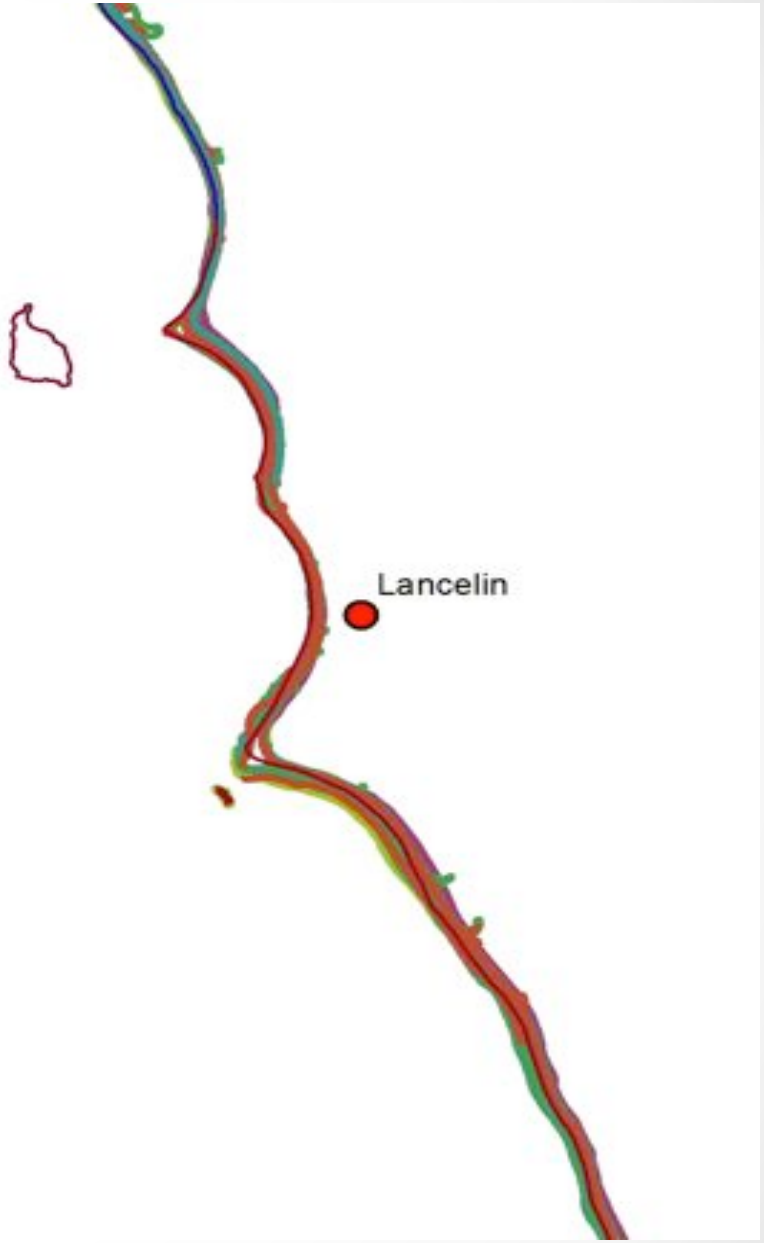
Existing Data & Information:

Shoreline Movement Plots

(DoT)1950-2000 at different intervals – available for each town.

Shoreline movement plots are important for understanding long-term shoreline changes.

Helps inform losses and gains of sediment from the coast.



Existing Data & Information:

Aerial photos & Site Photos

AERIAL PHOTOS

DoT has a collection of photos in hard and electronic copies of different years and scales going back to 1940 to the present days.

FIELD PHOTOS

Field photographs should be undertaken as an on-going exercise after major storms, winter and summer.

DoT collects some field photos.

NACC Beach Monitoring Program – regional dataset

Data Gaps for hazard mapping

DETAILED/SITE SPECIFIC HAZARD MAPPING
Higher resolution and recent (less than 10 years old) bathymetries
Local scale beach and nearshore surveys
Description geomorphological features at the local scale (sediment cells) including features such as tombolos, cuspate forelands, etc.
Current and long term local scale sediment transport regimes and sediment budget rates
Historic analysis of water levels (including storm surge heights) associated with extreme weather events
Local wave data collection
Projected wave climate response to SLR scenarios
Region specific sea level rise projections
Geotechnical assessments nearshore and onshore (sediment/rock relationships)
Freshwater flooding mapping

Recommendations

- Coastal Assets and Values Study
- Beach Monitoring Program:
  - a) compilation of historic photographs of beaches
  - b) on-going Community Beach Monitoring program
  - c) Beach Profile Monitoring Program
- New bathymetric data:
  - Option 1: LiDAR / LADS survey
  - Option 2: Multi beam surveys
- Historic analysis of existing metocean drivers
- Geotechnical surveys
- Landform stability & Sediment Transport Study
  - Sediment sampling program
- Shoreline movement plots analysis (on-going)
- Structure condition assessment (on-going)


Thank you for listening,
Questions?

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Managing coastal erosion & inundation

Karl Ilich – Coastal Engineer

Lancelin –
courtesy of GSWA

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Overview

- Responsibilities of DoT Coastal Management Group
- Coastal Hazard Risk Management & Adaptation Planning process
- What to do

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Responsibilities of DoT's Coastal Management Group

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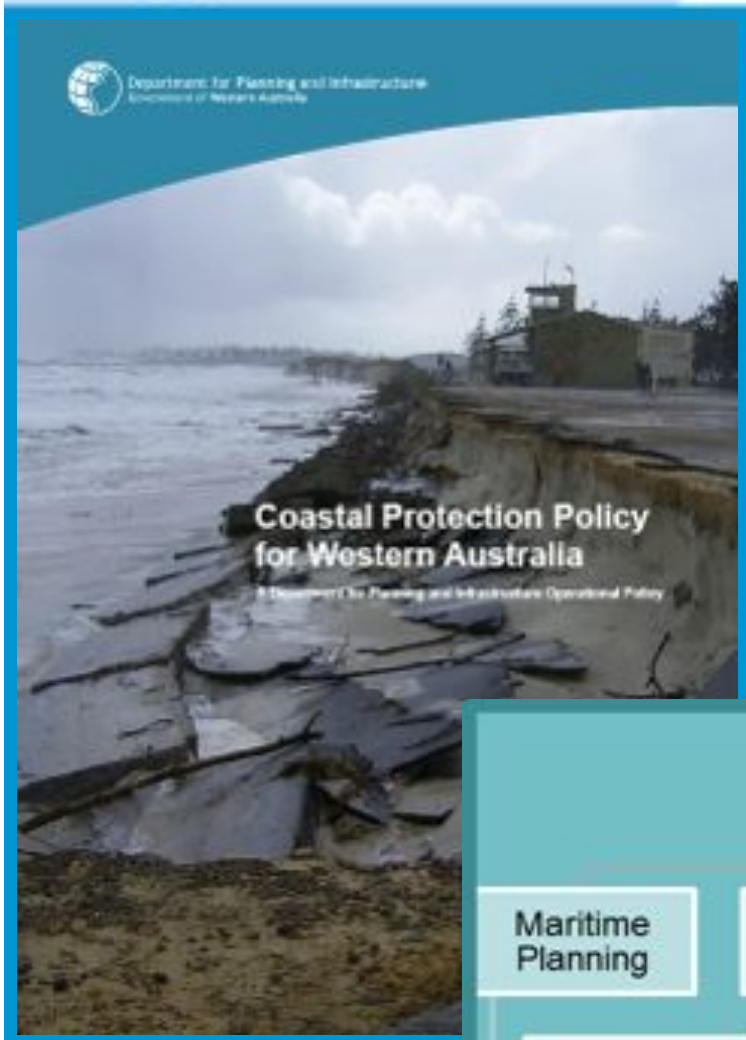
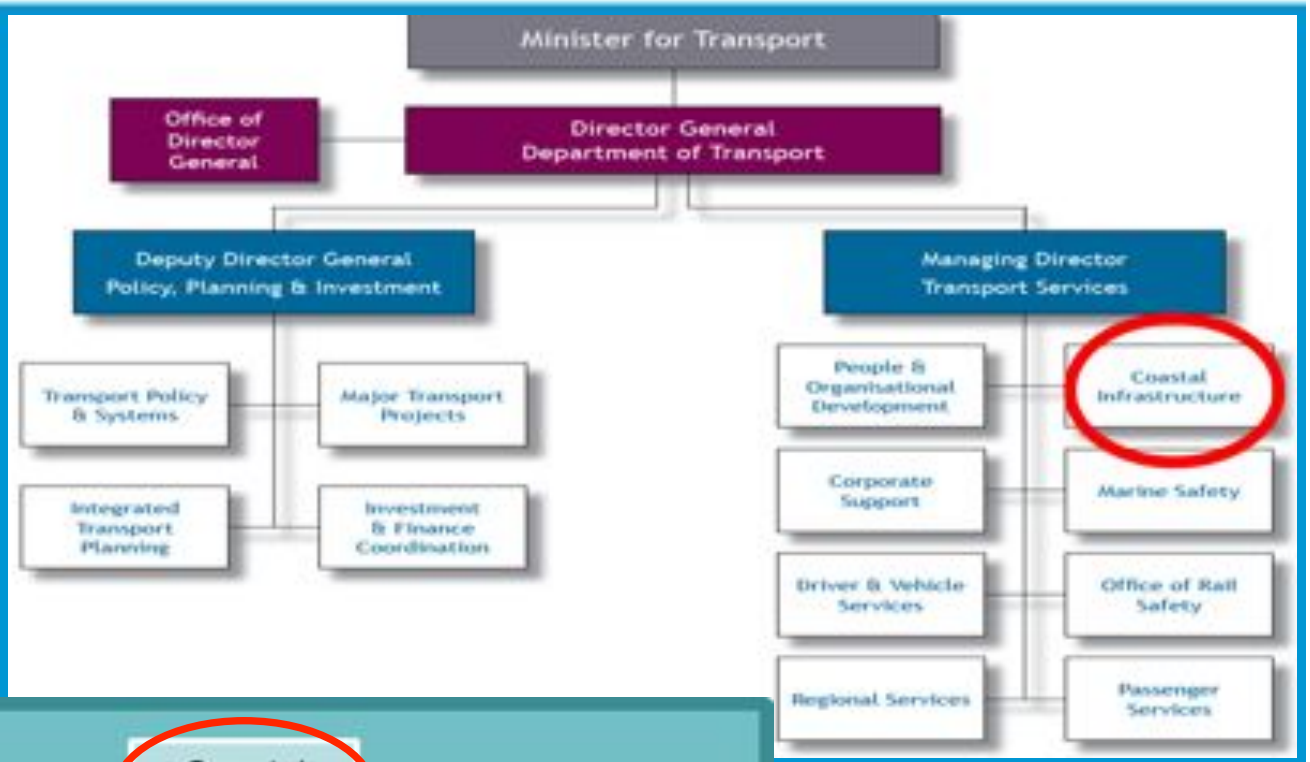
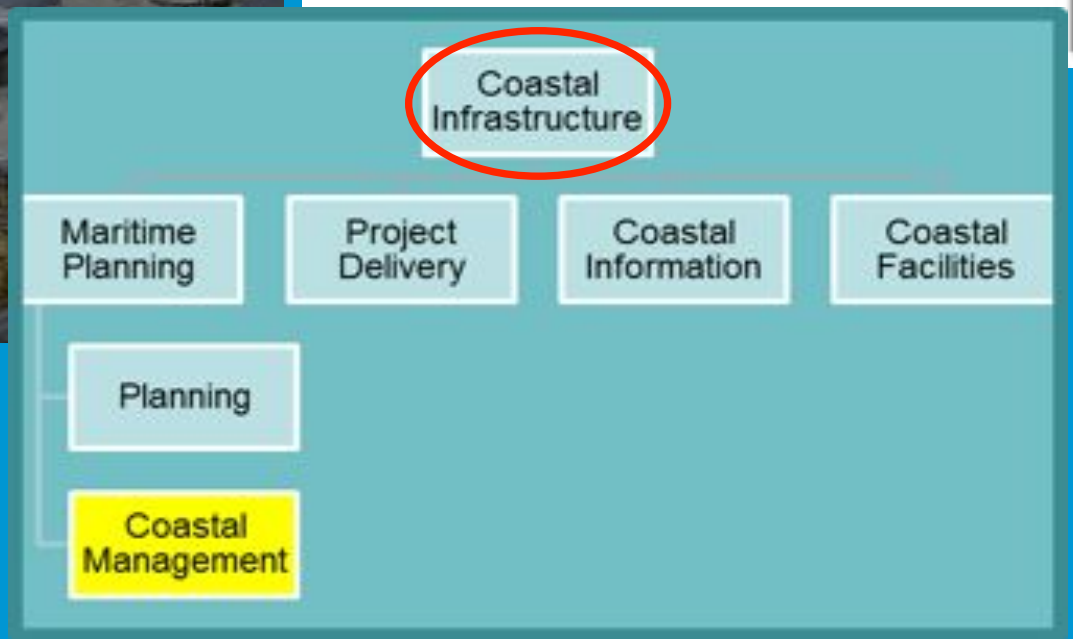
Who are we?







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Who are we? What do we do?

- 4 people - coastal engineers & scientists
- In order to fulfil DoT's role in providing and promoting facilities for small boats and in coastal management CIBU acquire, analyse, maintain and present data relating to the coastal zone. CIBU maintain a high level of coastal expertise
- When and where resources permit CIBU provides expertise, advice and info. to local land managers on coastal management matters
- Western Australia does not have special purpose coastal protection legislation which assigns responsibility for coastal management to a particular agency or Minister.

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Responsibility for Coastal Management

- Most of the WA coast is in public ownership. Local government authorities have vested responsibility for coastal management at majority of the WA coast.
- Smaller sections are vested for specific purposes in organisations such as Port Authorities, the Commonwealth and State government agencies and authorities, aboriginal land councils. These bodies have legal responsibility for management of particular areas, are known as land managers.
- Other agencies (DoF, DoP, DEC, DoT) also have a role on the coast according to their governing legislation.

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Coastal Hazard Risk Management & Adaptation Planning process

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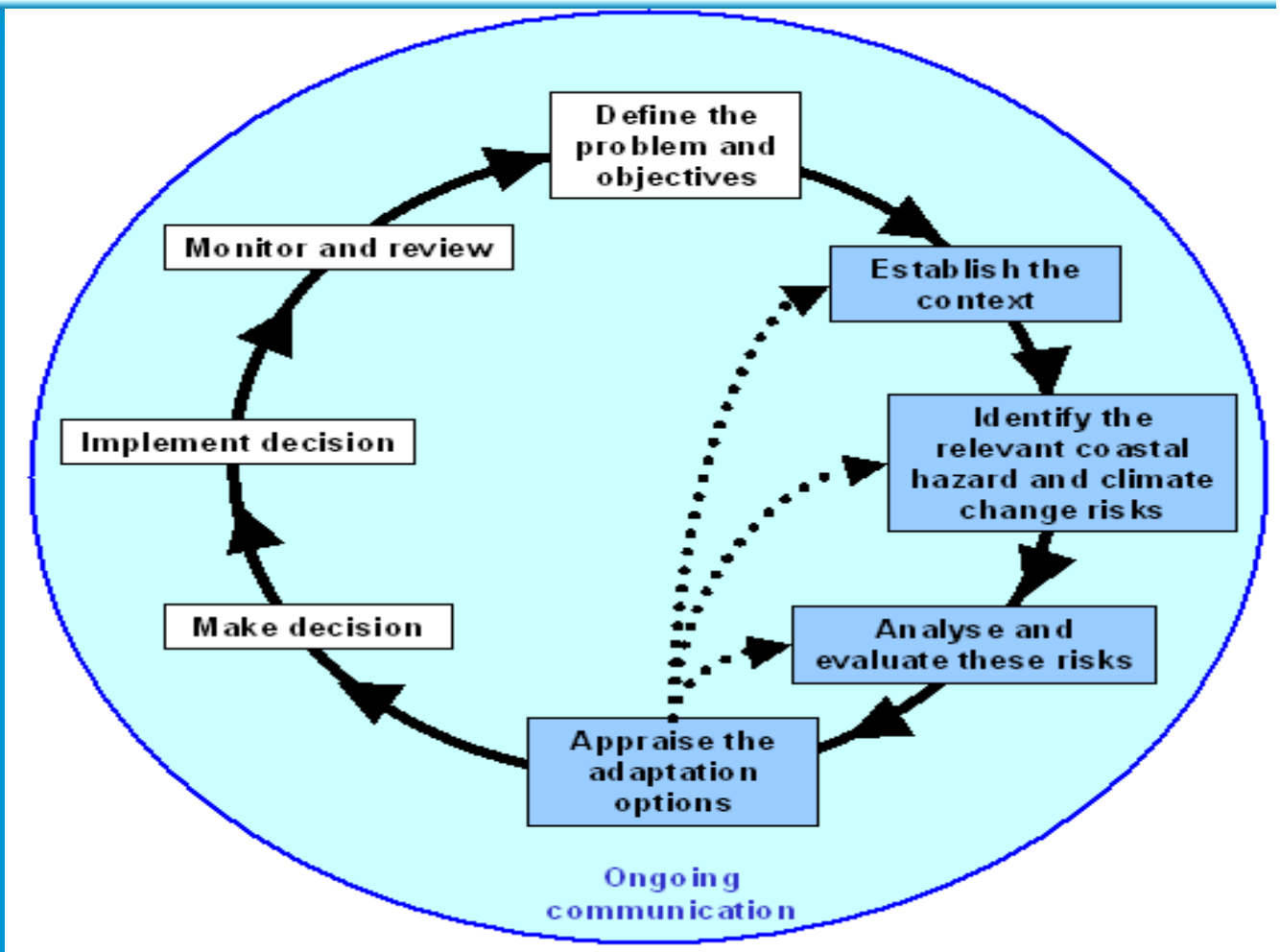
Recommended coastal adaptation cycle

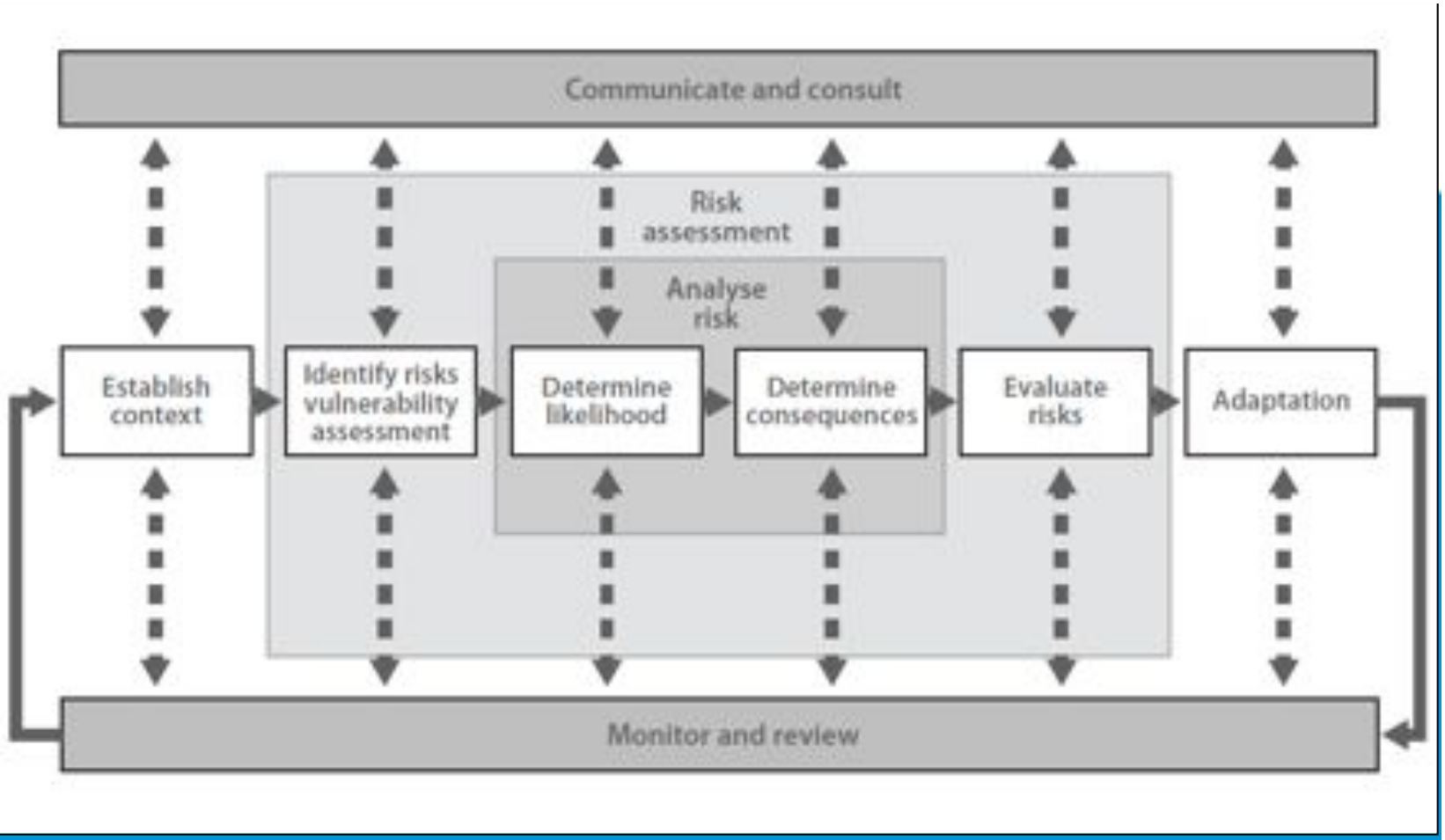
Sustainable strategies meet the needs of people today (i.e. they reduce flooding and erosion), without stopping people in the future getting the things they need.



Want to maintain future flexibility and aim for no regret!

Departm
Transpo

What is Coastal Hazard Risk Management and Adaptation Planning (CHRMAP)?



- A risk based approach / thinking-process for coastal management
- A system that can be used on a strategic level to direct an organisation's efforts and resources
- A guide on a project level to link and direct operational/task-based work which needs to be undertaken - but it is not a set of prescriptive rules.

Flowchart

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What to do!?

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What to do

- Accept that erosion and inundation does happen & will be more frequent
- Don’t panic!
- Seek funding
- Plan & manage for change…
  - Monitor coastal processes
  - Define coastal hazards
  - Plan adaptation (avoid, managed retreat, accommodate, protect)
  - Reduce uncertainty – monitor some more
  - Maintain future flexibility
  - Aim for no regret

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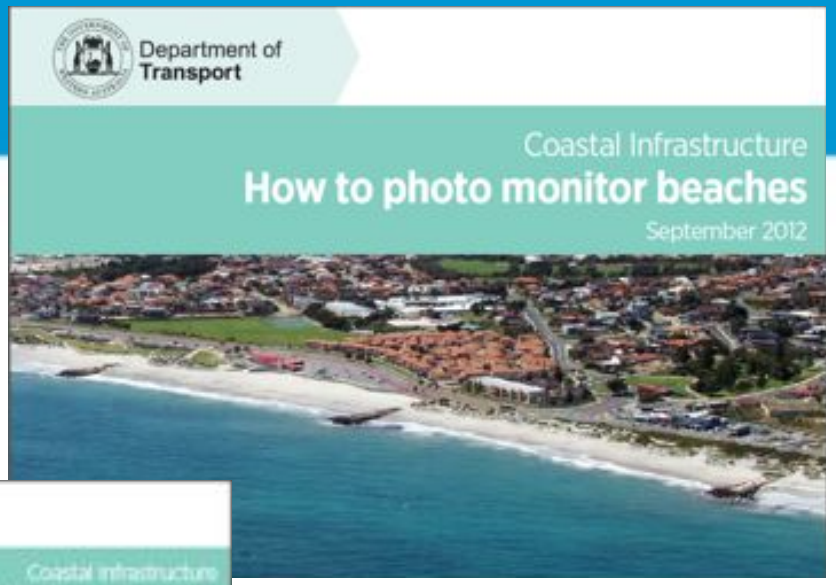
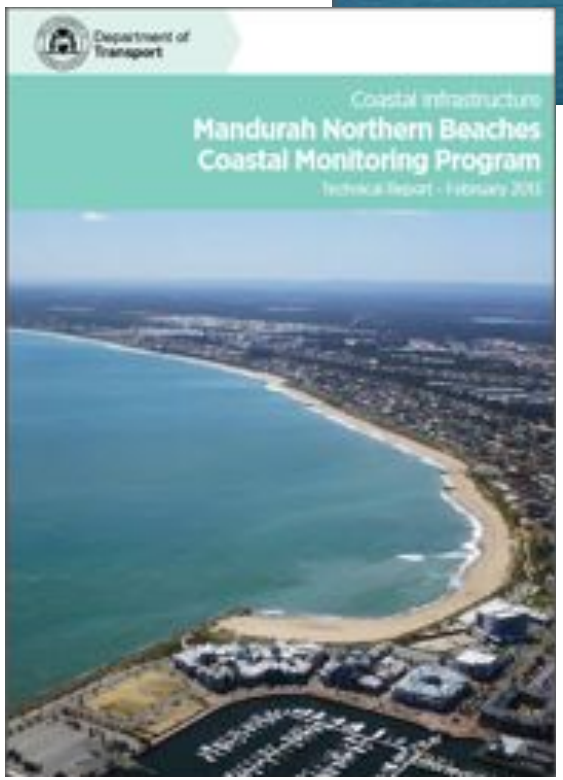
Monitoring

Why monitoring is vital?

- Data is an investment in the future.
- Lack of relevant data on a scale that can be useful in local hazard management.
- Opportunity exists to establish baseline information about the physical features and characteristics of the coast and to identify ongoing processes.
- Prepare and implement a coastal monitoring program! –Talk to DoT





Essential Physical Data for Managing your coast

- Metocean data:
  - Waves
  - Water levels
  - Wind and wind-driven currents
  - Sea level rise & climate change
- Geology and Geomorphology:
  - Location/nature of rock (perched beaches?)
  - Beach, topographic & hydrographic survey
  - Aerial & field photos
- Sediment transport:
  - Sediment cells – (incl. controls, structures)
  - Sediment samples
  - Sediment budget
  - Benthic habitat info

- Historical data/info - behaviour over last 10, 100, 1000 yrs.
- Sufficient resolution in time and space
- Other info:
  - Environmental Data
  - Sociological Data
  - Materials Data (rock/ sand?)

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Adaptation Planning

What is coastal adaptation planning?

- The process that leads to a reduction in risk, OR creates realisation of benefits associated with coastal change.
- Adaptation can be seen as developing a cure for a problem once it has already started, ("mitigation" aims prevent future problems).
- Anticipating, planning for and adjusting to potential future coastal change.
- The definition of successful adaptation depends on your perspective. A coastal community that is facing permanent loss of properties or land are likely to see things differently to communities who are not immediately at risk. Perhaps "no regret".
- **Adaptation:** Avoid (SPP2.6), Managed Retreat, Accommodate, Protect
  - Consider emergency and long-term wants/needs
  - Aim for no regret

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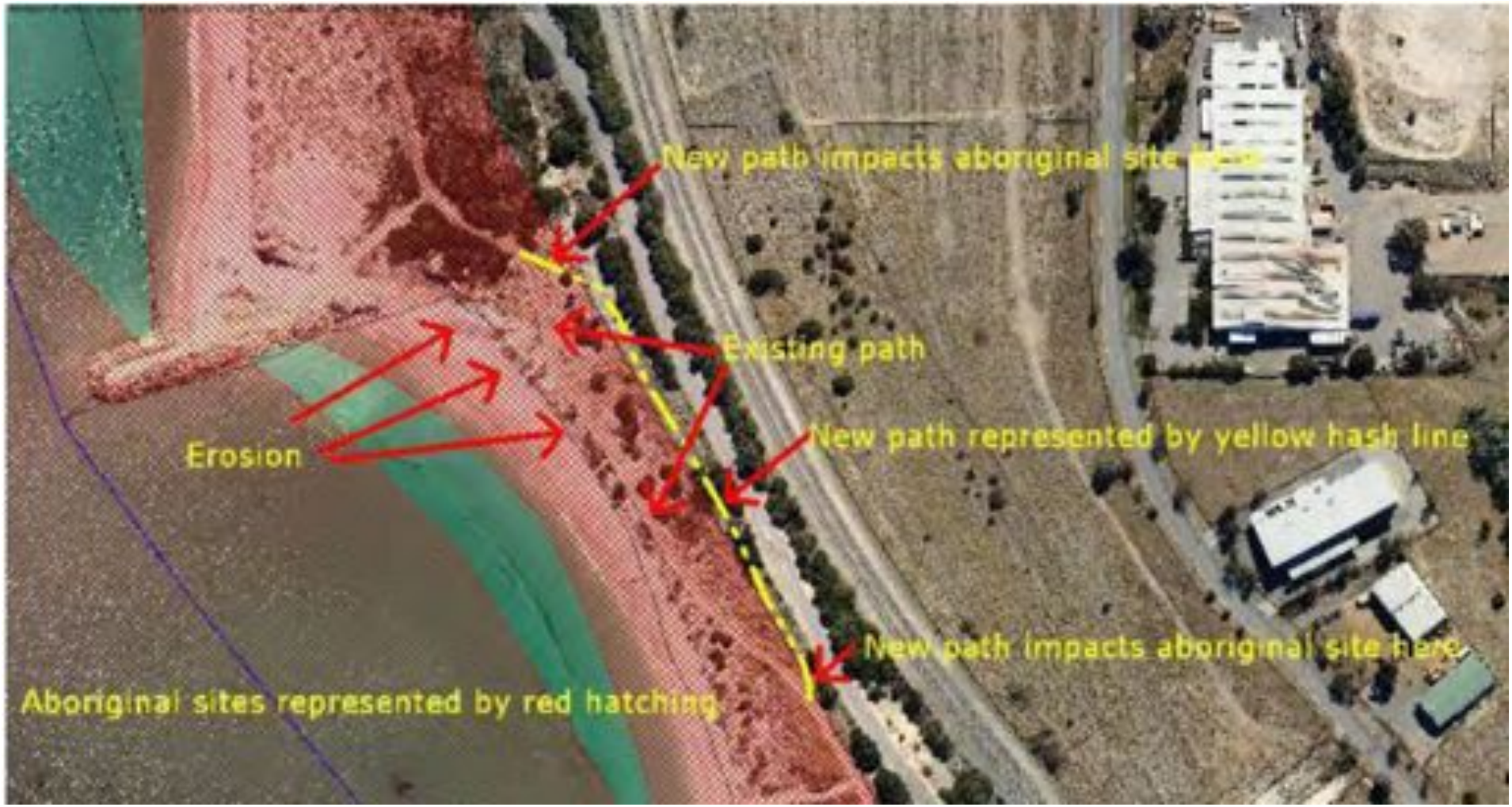
Example – Adaptation
(Managed Retreat)

Relocate dual use path at C.Y. O'Connor Beach, City of Cockburn



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Example – Adaptation
(Accommodate/protect)

Reconfiguration of the coastal structures at Port Geographe, 2013
DoT project

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Example – Adaptation
(Protection)

Beach nourishment. **Always first emergency option!**
Need a source of sand (check grain size and volumes)

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Example – Adaptation (Protection)

Watermans Bay geotextile bag seawall, 2010 – City of Stirling
- a “soft” structure

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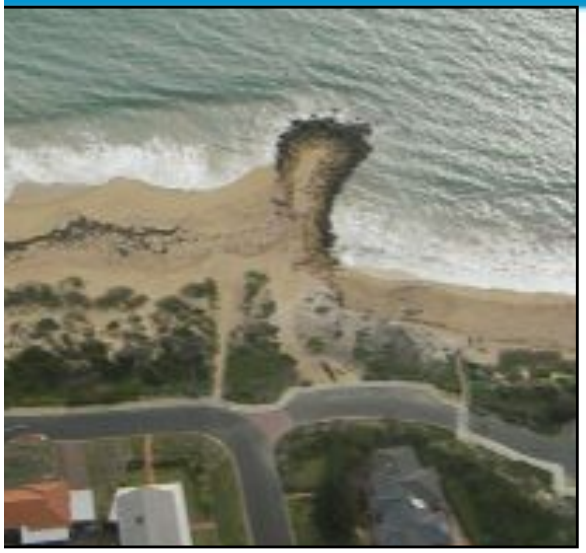
Examples – Adaptation (Protection)

Groynes, artificial headlands, seawalls, artificial reefs – “hard” structures



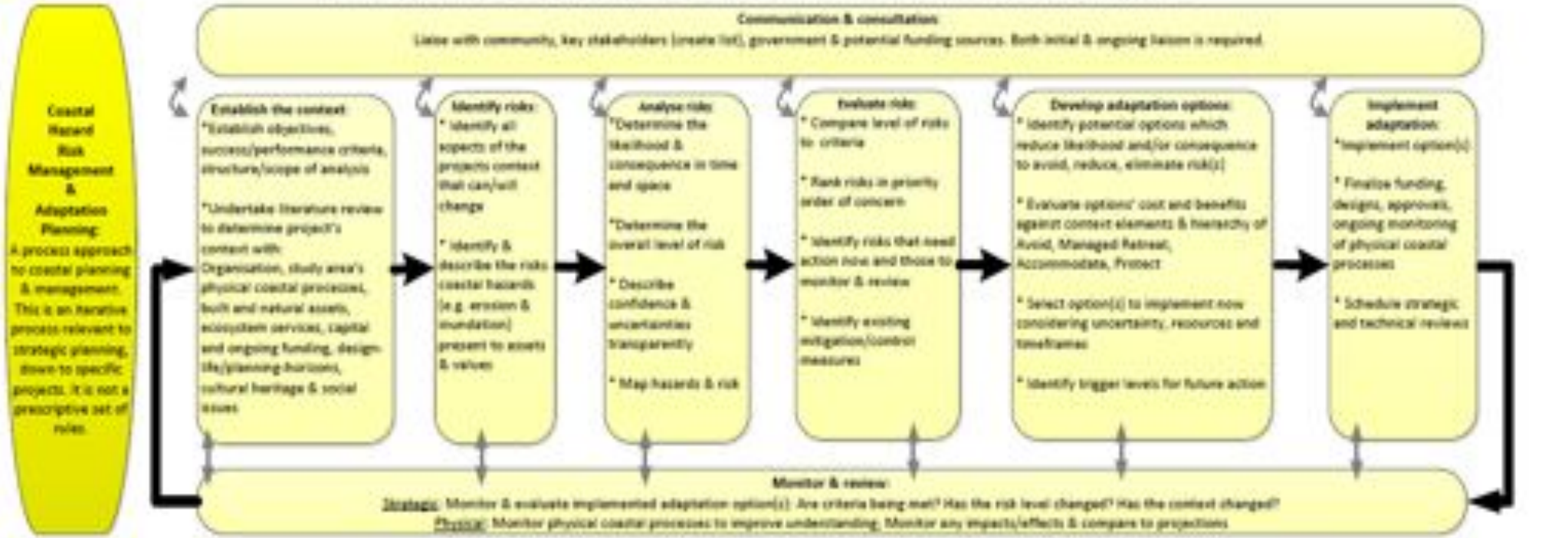
Coastal protection structures are a last resort.

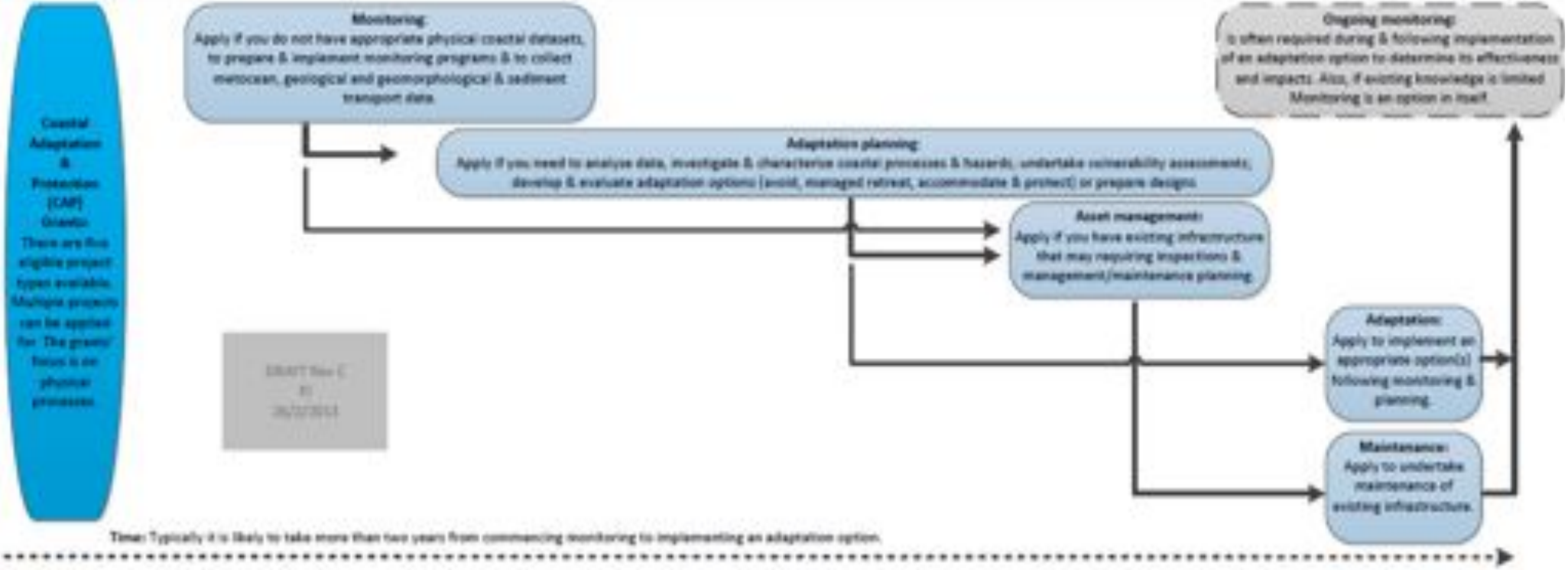
Thank you – any questions ?

Government of **Western Australia**
Department of **Transport**
Coastal Management

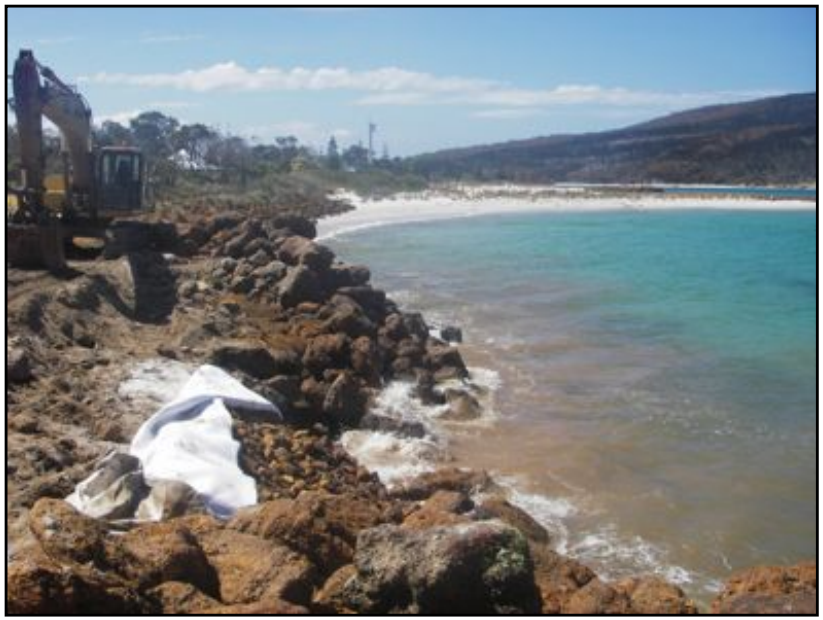
Email: karl.ilich@transport.wa.gov.au

Coastal Hazard Risk Management & Adaptation Planning (CHRMAP) & Coastal Adaptation & Protection (CAP) Grants process flowchart

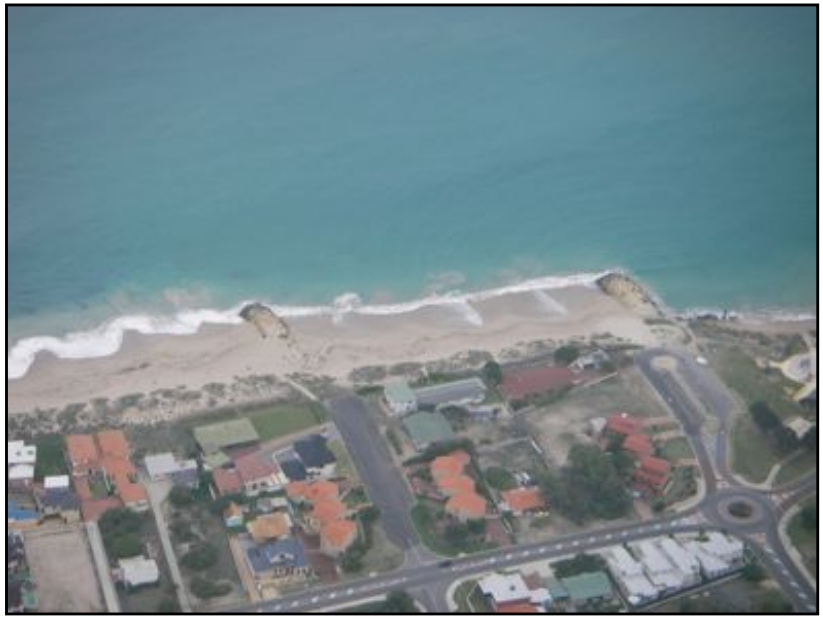




sea walls

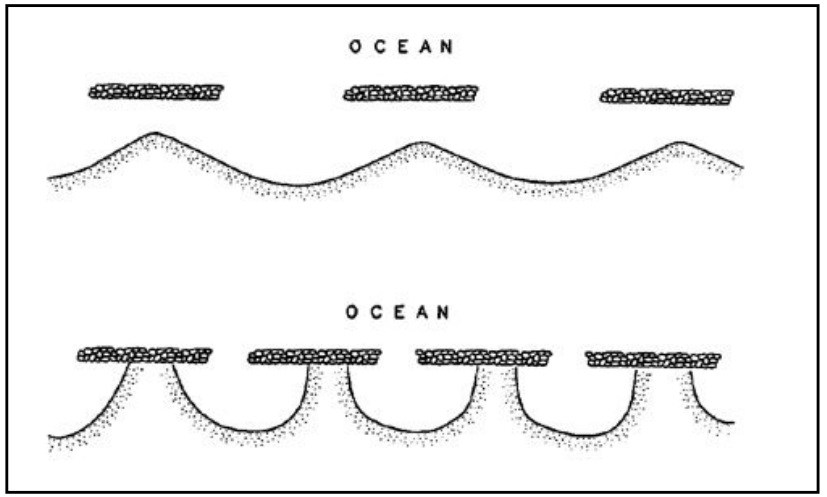


groynes



Busselton

offshore breakwaters



sand nourishment

Coastal Hazard Risk Management and Adaptation Planning Workshop Shires of Gingin and Dandaragan

Planning and legal context

Associate Professor Dr Garry Middle
Department of Urban & Regional Planning
Curtin University
Chair of the Coastal Planning Coordination Council

Curtin University

Overview

- WA planning context
- Legal issues for local government
- Broader local government decision making
- *First – a word from the Productivity Commission*

Curtin University

Productivity Commission 2012 report

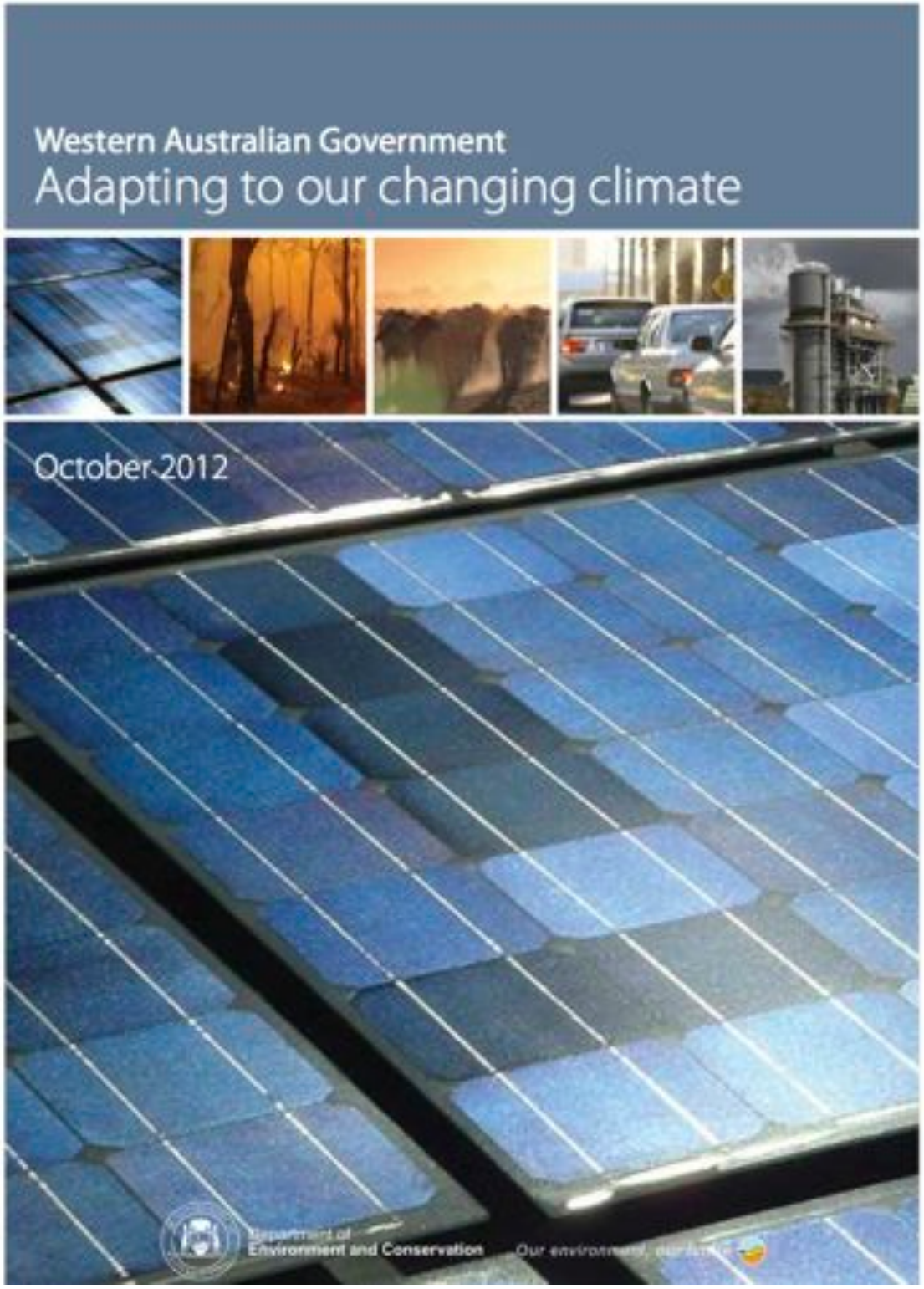
- "Barriers to Effective Climate Change Adaptation"
- 3 key Barriers to local government adaptation
  - poorly defined roles and responsibilities for adaptation
  - local government capacity constraints, including financial constraints, lack of information and guidance, and skill shortages
  - legal liability concerns of local governments.

Productivity Commission 2012 report

- Legal liability issues
  - Release or not release information relating to climate change impacts?
  - Approve or refuse applications for development that may be susceptible to climate change risks?
  - Make changes to planning instruments to incorporate climate change considerations, which affect existing developments? Compensation?
  - Install or not install protective structures, including maintenance and upkeep

1. WA Planning context

- Focus on Coastal Adaptation to Climate Change
- State Adaptation Strategy
- The Act
- 2010 WAPC policy statement – sea level rise
- Draft revised SPP 2.6 – State Coastal Planning Policy (update to 2003 SPP 2.6)


Western Australian Government
Adapting to our changing climate
October 2012
Department of
Environment and Conservation

University

Relevant issues

- Increased risk of coastal erosion recognised (P3);
- Under adaptation
  - Adaptation of buildings and infrastructure to storm surges required
- Under actions
  - Major infrastructure – planning to consider climate change
- No mention of broader land use planning

Planning and Development Act 2005

- Purposes
  - (b) provide for an efficient and effective land use planning system in the State; and
  - (c) promote the sustainable use and development of land in the State.
- "sustainable use and development of land" not defined

Planning and Development Act 2005

- "6. Act does not interfere with public works"
  - Allows State and Local Governments to
    - "(a) to undertake, construct or provide any public work;
    - (b) to take land for the purposes of that public work."
  - Rights subject to
    - "(a) the purpose and intent of any planning scheme that has effect in the locality where, and at the time when, the right is exercised; and
    - (b) the orderly and proper planning, and the preservation of the amenity, of that locality at that time."

Planning and Development Act 2005

- Part 3 – State Planning Policies
- Part 5 – Local planning schemes and SPP
  - 77 (1)
    - "Every local government in preparing or amending a local planning scheme —
      - (a) is to have due regard to any State planning policy which affects its district;"
- In Practice – SPP is default position

Quick word on 2003 SPP 2.6

- Coastal setbacks
- S1 + S2 + S3
- S1 – acute storm erosion
  - Default 40 m
- S2 – Historic trends over last 40 years
  - Accreting shore – 0
  - Stable shore – 20m
  - Eroding – 100 times annual erosion rate – typically 40m
- S3 – sea level rise
  - 38m
- Typically S1+S2+S3 = 100m

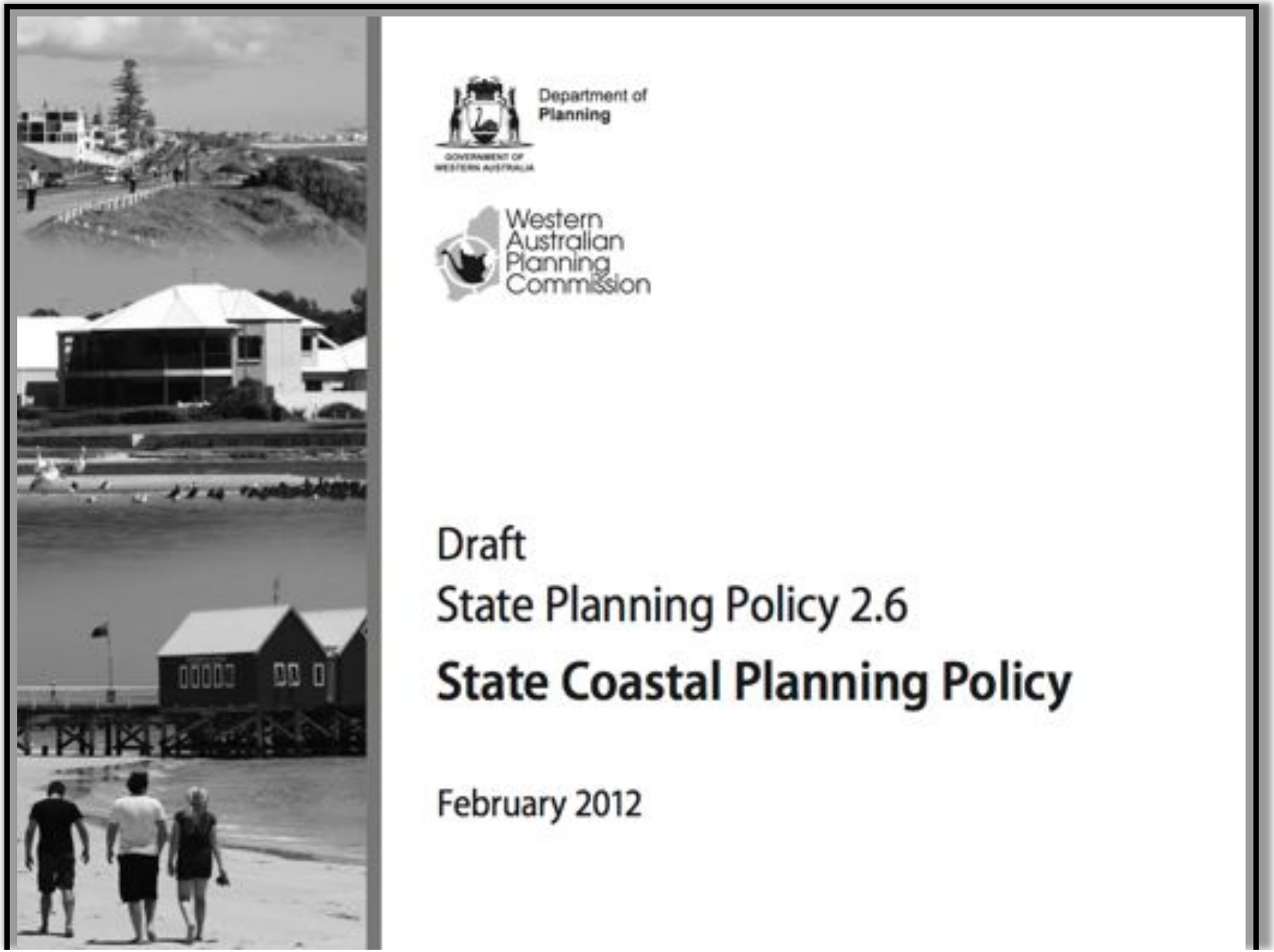
2010 WAPC policy statement – sea level rise

- Endorsed by Cabinet
- Response to new data from Fourth Assessment Report (IPCC AR4)
- S3 (sea level rise component of setback calculations) of 0.38 no longer appropriate
- 0.9 m translating to a setback of 52m
- General setback - from 100m to 150m."
- Planning timeframe – next 100 years

Sea level rise values in other States

- SA - 0.3m plus 0.7m by 2050 or 1m to 2100
- Vic – 0.8 to 2100
- Tas - 0.3m to 2050 & 0.9m to 2100
- NSW – 0.4m to 2050 & 0.9m to 2100
- Qld - 0.3m to 2050 & 0.8m to 2100
- NT - ?
- Canberra – not drowning, waving

Draft revised SPP 2.6



Draft revised SPP 2.6

- 4 policy objectives
  - "Ensure that the location of coastal facilities and development takes into account coastal processes, landform stability, coastal hazards, climate change and biophysical criteria;
  - ensure the identification of appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities;
  - provide for public coastal foreshore reserves and access to them on the coast …
  - Protect, conserve and enhance coastal values …"
- no fundamental change from 2003 SPP

Draft revised SPP 2.6

- Planning timeframe – next 100 years

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Draft revised SPP 2.6

- 5.5 Coastal hazard risk management & adaptation planning
  - Adequate coastal hazard risk management and adaptation planning required
  - LG for existing development, developer for new
  - "Where a coastal hazard risk is identified it should be disclosed to those likely to be affected."
  - "Where risk assessments identify a level of risk that is unacceptable to the affected community or proposed development, adaptation measures need to be prepared to reduce those risks down to acceptable or tolerable levels"
- Not in 2003 SPP

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Draft revised SPP 2.6

- 5.5. (iii) adaptation hierarchy
  - Avoid – new developments
  - Planned or Managed Retreat – existing
  - Accommodation
  - Defend or protect
- 5.6 Infill
  - If within timeframe of coastal hazard, then apply above hierarchy
- Not in 2003 SPP

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Draft revised SPP 2.6

- 5.7 Coastal protection works
  - (i) general presumption against new coastal protection works
  - (ii) Significant works on existing coastal protection works to be considered new coastal protection works.
- Stronger position than in 2003 SPP
  - "… where possible, avoid …" (5.1 (xxii)

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Draft revised SPP 2.6

- 5.11 Precautionary principle
  - "(i) Where there are threats of serious environmental damage, lack of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation."
  - onus on proponent to demonstrate compliance to Precautionary principle
- Need to plan for and with uncertainty
- Not in 2003 SPP
- S3 – 0.9m – 100 year planning timeframe
  - Consistent with 2010 WAPC position

Public interest

- Ensure public participation in coastal planning and management
- Removal of shacks
- Public ownership of the coast
- "The provision of public access to the coast consistent with the values and management objectives of the area …"
- Consistent with 2003 SPP

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Status of Draft revised SPP 2.6

- Subject to public review
- Considered by WAPC and recommendation to Minister to approve with minimal changes – 11/12
- Arguably a *seriously entertained* planning policy

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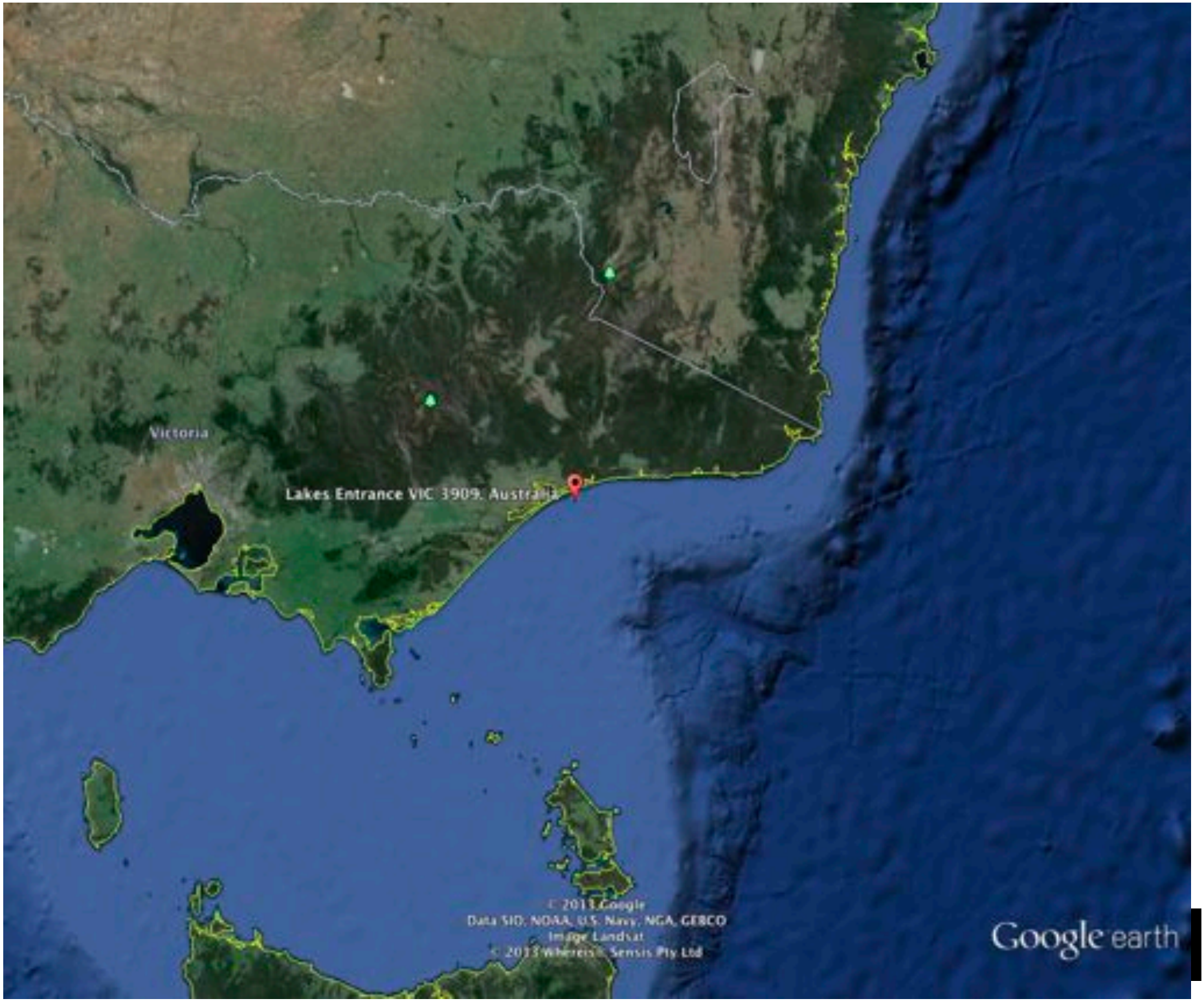
2. Some relevant case law

L Taip v East Gippsland Shire Council

- Victorian Civil and Administrative Tribunal Decision by the East Gippsland Shire Council to grant a permit for residential development of eight dwellings in Lakes Entrance
- Land Subject to Inundation - planning overlay
- Decision was based on existing level of flood risk and hazard – Council did initially considered increased risk because of climate change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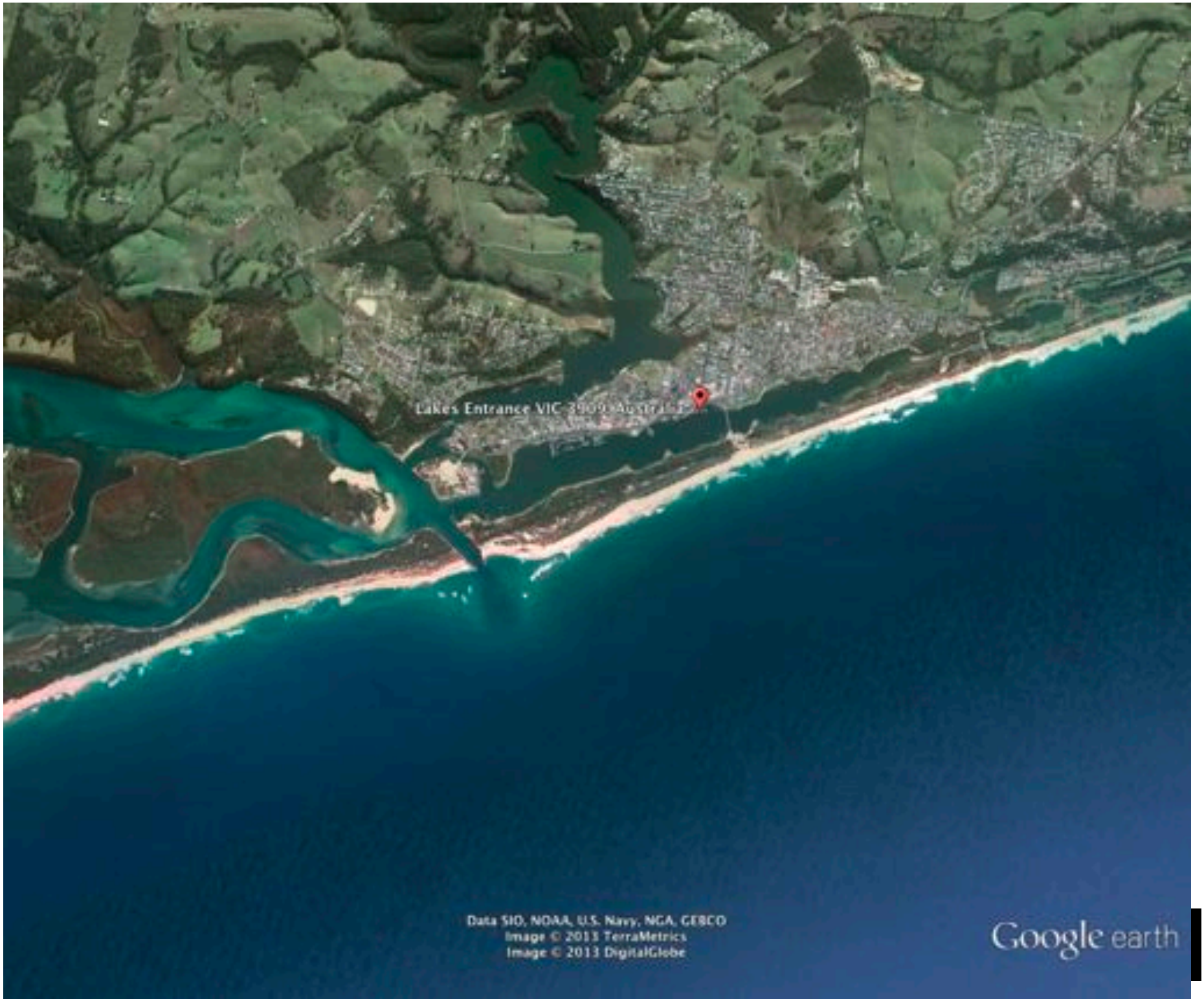
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Lakes Entrance VIC 3909, Australia
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L Taip v East Gippsland Shire Council

- Tribunal found
  - A permit to develop should not be issued.
  - Approval "failed to take account of the current understanding of climate change impacts, including sea level rise to Lakes Entrance."
  - "… approving this development would not be an orderly planning outcome."
  - Relevant policy requires CC be taken into account "There is a planning policy imperative to act now rather than later."
  - Deferring a decision about impacts of CC "at odds with the State's desire for planning and responsible authorities to address them now."

L Taip v East Gippsland Shire Council

- Precautionary principle
  - "111 … the overall approach in applying the precautionary principle is to ensure that:
    - The planning decision about this development is made in the face of acknowledged climate change impacts and should not be deferred;
    - The decision assesses how the risks from climate change can be minimised to an acceptable level; and
    - Any uncertainty surrounding the potential impacts from climate change should not be a reason to defer decision making. "

L Taip v East Gippsland Shire Council

- “Further consideration of how the risks from climate change can be minimised is required. The Council, as a planning and responsible authority, needs to take a lead role on this issue. Until such a response can be devised it is inappropriate to allow this development to proceed.”
- Concern that Council’s policies didn’t adequately address CC

Walker v Minister for Planning – 2007

- Minister for Planning approved concept plan approval for a residential subdivision and a retirement development at Sandon Point in NSW.
- Did not consider increased risk of flooding because of climate change
- Ms Walkers challenged decision at NSW Land and Environment Court


Sydney
Sandon Point
Image Landsat
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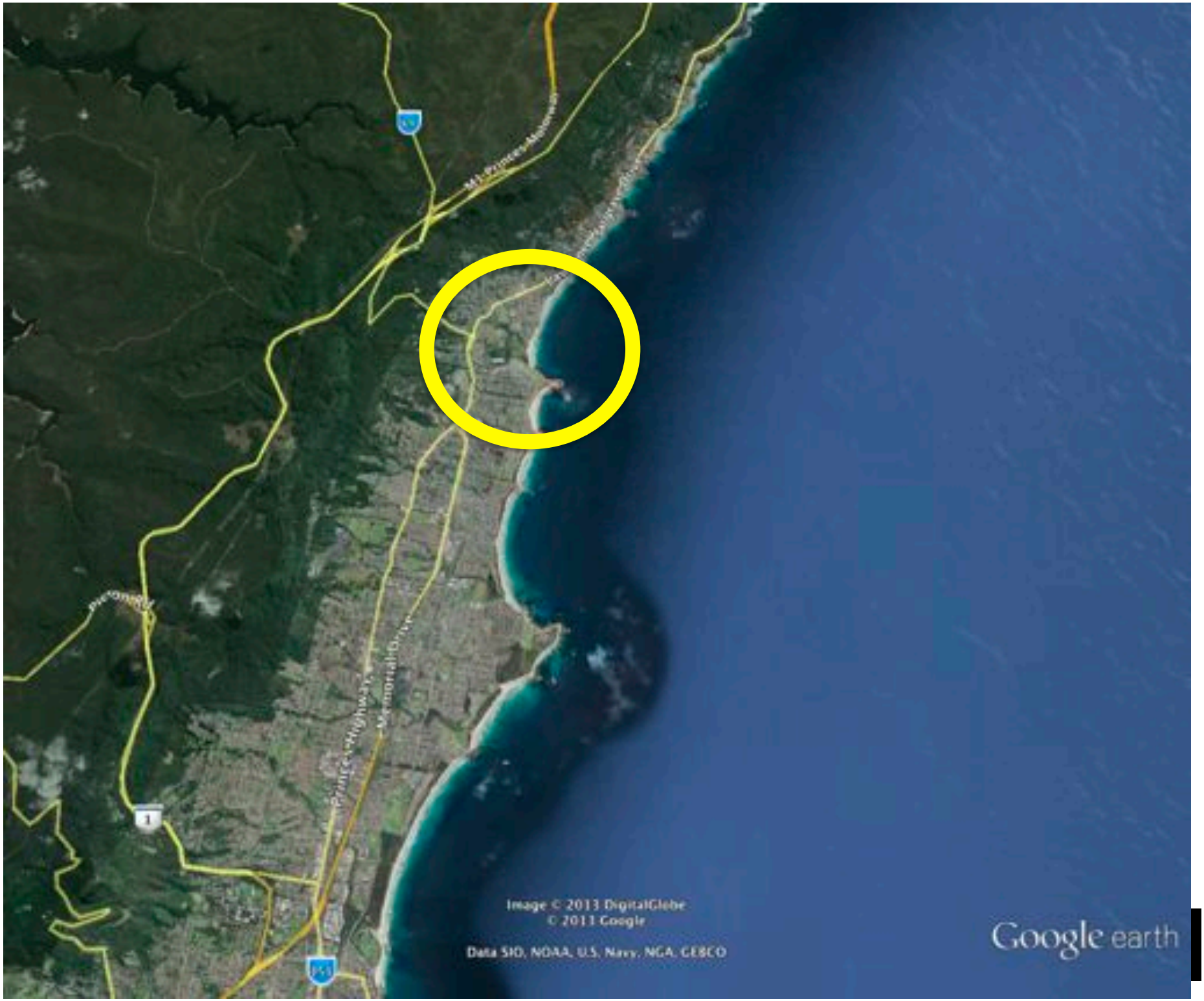
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Hobart St
Westmacott Parade
Hutton Ave
Park Rd
Ursula Rd
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Walker v Minister for Planning – 2007

- Decision overturned
  - "Having regard to the subject matter, scope and purposes of the EP Act and the gravity of the well known potential consequences of climate change, in circumstances where neither the Director-General's report nor any other document before the Minister appeared to have considered whether climate change flood risk was relevant to this flood constrained coastal plain project, the Minister was under an implied obligation to consider whether it was relevant and, if so, to take it into consideration when deciding whether to approve the concept plan. The Minister did not discharge that function."

Northcape Properties Pty Ltd v District Council of Yorke Peninsula - 2008

- Yorke Peninsula District Council refused an application for residential development on the outskirts of Marion Bay


Adelaide
Yorke Peninsula
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Google earth


Marion Bay SA 5575, Australia
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Northcape Properties Pty Ltd v District Council of Yorke Peninsula

- Risk or coastal erosion or 30-45m next 100 years
- Appealed by developer dismissed
- Strong Council policy
  - "To promote development which recognises and allows for hazards to coastal development such as inundation by storm tides or combined storm tides and stormwater, coastal erosion and sand drift; including an allowance for changes in sea level due to natural subsidence and predicted climate change during the first 100 years of the development."

Charles Howard Pty Ltd v Redland Shire Council - 2007

- Council required the applicant build his house on a part of the land not subject to inundation by the 1 in 100 flood level
- 2006 Planning Scheme used revised 1 in 100 flood level based on climate change and flooding impacts
- Applicant appealed


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20 Albert St, Victoria Point QLD 4165, Australia
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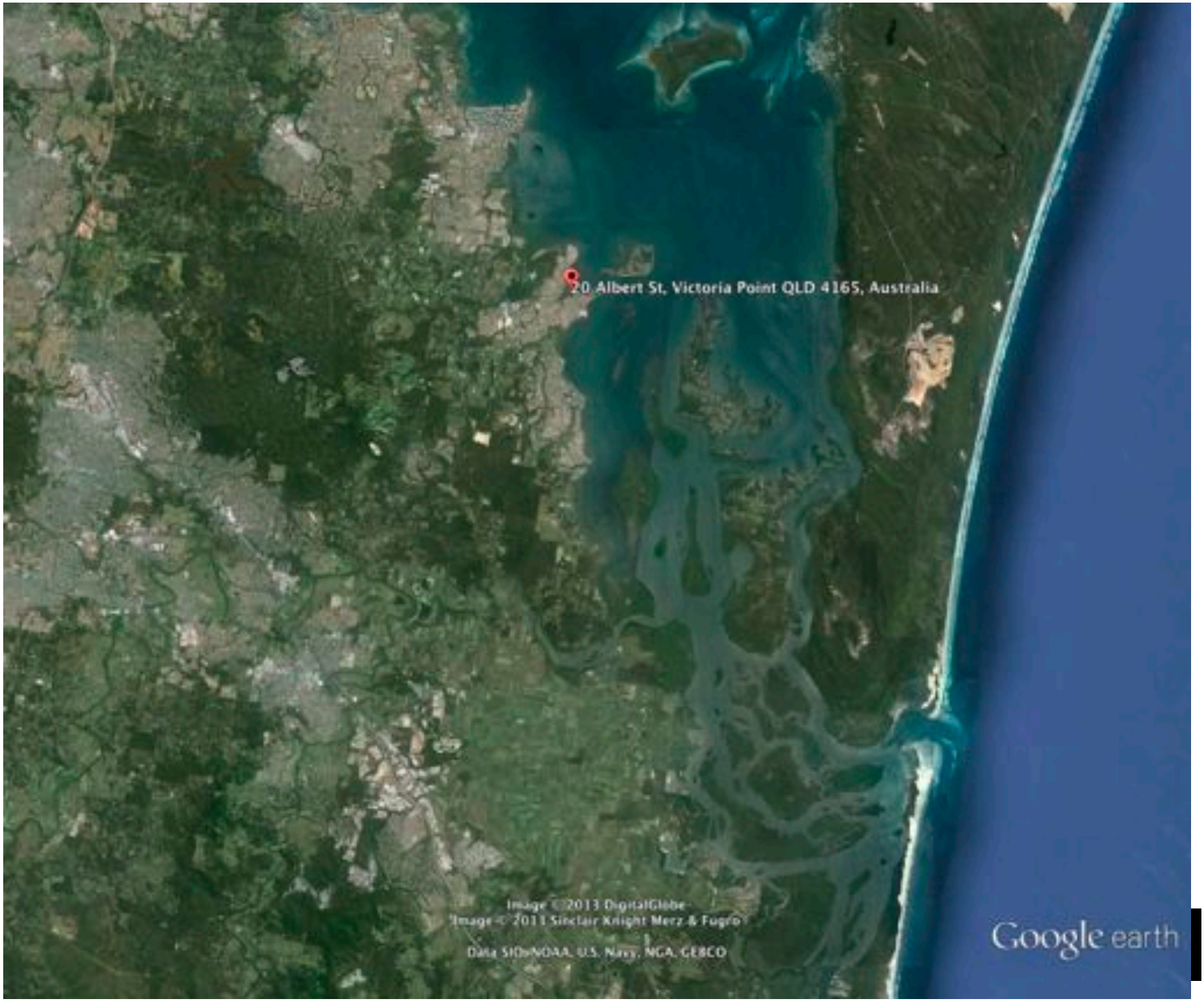
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Outcome

- “The town planning documents are quite against the appellant’s proposal. They give much support to the position adopted by Council. The condition imposed by Council is reasonable and relevant, as it better reflects the aims of the town planning provisions.”
- Appealed by was dismissed
- Council subsequently carried out risk assessment for coast – erosion and flooding

Parkes vs Byron Shire Council - 1

- Council refused Owner to carry out protection works for his beachfront property
- Existing wall within reserve
- Appealed, but dismissed
- Court found
  - Need cooperative approach as other properties would be impacted
  - Approval would promote *ad hoc* approach

Parkes vs Byron Shire Council - 2

- Council refused application to change house from residential to B&B
- Building within 20m risk zone and thus require further protection works (see previous) or demolish and move back
- Council has retreat as preferred option and supported by Court

Legal liability

- NSW Civil Liability Act 2003
  - Council only liable where it act or fails to act are "so unreasonable"
  - Reasonableness relates to the functions of that local government
  - Failure to take adaptation measures because of climate change likely to be considered "unreasonable" because of weight of evidence

Final words

- The outcomes of CHRMAP is really a small part of a Climate Change adaptation strategy
  - The 'line' defines where certain actions take place
  - The strategy sets out what the action is
  - Planning scheme vs zoning map
- Broader issues for local government
- More than just planning and decision making
- Consider Council's own at risk infrastructure
- Emergency management

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Peron Naturaliste Partnership

Peron Naturaliste Partnership

Business Plan 2013 - 2015 .....

WA Coastal Conference 2013

Peron Naturaliste Partnership

Joanne Ludbrook

WAROONA SEA TO SCARP · City of Busselton Geographe Bay · SHIRE of CAPEL · Shire of Murray · CITY OF BUNBURY · Shire of HARVEY A Breath of Fresh Air · SHIRE OF DARDANUP PARADISE COUNTRY · city of Rockingham · City of MANDURAH

Peron Naturaliste Partnership

Peron Naturaliste Partnership

‘

Peron Naturaliste Partnership

The vision of the Peron Naturaliste Partnership is to empower a resilient regional community to reduce risks and optimise opportunities presented by climate change.

city of Rockingham

Shire of HARVEY
A Breath of Fresh Air

SHIRE OF DARDANUP
PARADISE COUNTRY

SHIRE of CAPEL

City of Busselton
Geographe Bay

CITY OF BUNBURY

Shire of Murray

SHIRE OF WAROONA
SEA TO SCARP

City of MANDURAH

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Overview

- A regional approach to making adaptation decisions is critical in ensuring local government take a ‘best shot’ approach to adaptation.
- The partnerships strengthen cooperation between Local Governments and State Government.
- Ongoing Communication of climate change to the wider community is crucial.
- A long term approach has been identified as the best way to address risks associated with coastal erosion and inundation.

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Partnership

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Pilot Community
Engagement Strategy
2013 - 2015

This is a direct action as prescribed in the Peron Naturaliste Business Plan and Communication Strategy. This is to implement a Pilot Community Engagement Strategy for Busselton, City of Mandurah and the PNP.

Communication
Strategy
2013 - 2015

This framework supports the delivery of communication the Peron Naturaliste Partnership.

Peron Naturaliste Partnership
Business Plan
2013 - 2015 .....

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CAPS Project Specific Reports

CAPS Fact Sheet & FAQ

Coastal Hazard Mapping Report and Technical Note

Climate Change Adaptation Options Assessment Report

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Communication Strategy

- Communicating the Key Messages of the PNP
- protect the existing partner's organisational brand, image and reputation
- provide framework and direction for public consultation and knowledge management
- guide external communications
- guide internal communication and capacity building
- Ensures meaningful public participation
- To reduce risk and optimise opportunities presented by climate change

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Communication Framework

This framework supports the delivery of communications for the Peron Naturaliste Partnership.

This includes communicating key messages and benefits, in addition to reducing risk exposure from identified issues.

It links to current best practice initiatives and ensures an agreed approach to PNP future actions

Benefits the community in adaptive capacity, building resilience and empowerment.

Shire of Waroona – Sea to Scarp
City of Busselton – Geographe Bay
Shire of Capel
Shire of Murray
City of Bunbury
Shire of Harvey – A Breath of Fresh Air
Shire of Dardanup – Paradise Country
City of Rockingham
City of Mandurah

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Identified Benefits

- The effective and well managed communication and transfer of information
- Potential to build community ownership of the project and its outcomes
- Increased the adaptive capacity of the community
- Coordinated management of knowledge to ensure sensitive information is communicated effectively
- Generate accurate and informative media around Climate Change Adaptation in the PNP region

Shire of Waroona – Sea to Scarp · City of Busselton – Geographe Bay · Shire of Capel · Shire of Murray · City of Bunbury · Shire of Harvey – A Breath of Fresh Air · Shire of Dardanup – Paradise Country · City of Rockingham · City of Mandurah

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Identified Challenges

- Delivery of consistent messages across all member councils
- Public Inquiries may require PNP partners or Project Officer to respond to contentious questions relating to Coastal Adaptation / Coastal risk
- Sensitivities around the management and release of generated data and reports
- Potential related insurance issues for council's and residents / businesses
- Legal liability issues related to Climate Change

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Internal Communication

Identified Issues

- Reliant on each Senior Officer to forward information to elected members and staff
- Ad-hoc approach to sharing scientific and technical information
- All LGs are at different stages of Coastal Adaptation
- There are capacity and time constraint issues within each LG

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External Communications

1. Media Communications
2. Web-based Tools
3. Capacity Building
4. Community Education
5. Stakeholder Engagement
6. Public Participation

Shire of Waroona – Sea to Scarp
City of Busselton – Geographe Bay
Shire of Capel
Shire of Murray
City of Bunbury
Shire of Harvey – A Breath of Fresh Air
Shire of Dardanup – Paradise Country
City of Rockingham
City of Mandurah

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Pilot Community Engagement Strategy

- Provide Community Education and Capacity Building opportunities;
- Generate accurate Media and Resources;
- manage ongoing two-way communication on coastal adaptation,
- Develop Knowledge Management system
- Facilitate Stakeholder Workshops and Community Forums
- Support meaningful partnership and collaboration

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Pilot Community Engagement

Google Earth Workshop in Busselton

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External Communications

Identified Issues

- Considering regional and local values
- Identifying and engaging with diverse range of stakeholders
- Delivering consistent messages
- Incorporating social values into decision making pathways
- Closing the gap between scientific knowledge and local knowledge

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- “Mainstreaming’ - integration into Council decision making (mainstreaming) – it is critical that Council think holistically and of the big picture. When dealing with Climate Change there is a need to tolerate uncertainty and accept the need for a long term focus. There is a urgent need to translate the latest science into sound and effective policy. Unfortunately there are no real quick fixes.
- The regional approach needs to be systematic, innovative and flexible and we should invest resources in innovation and research and development.

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- ICZM – An Integrated approach to managing out coastal environment is critical. An intricate network of agencies, organisations, interest groups and individuals have an active role to play in the future of this highly valued and high access environment.
- Sustainability and Inter-generational Equity- An integrated and regional approach to managing coastal adaptation in WA is essential in coastal adaptation planning and balancing social / economic and environmental values 'triple bottom line'.
- Precautionary Principle – 'No Regret' option

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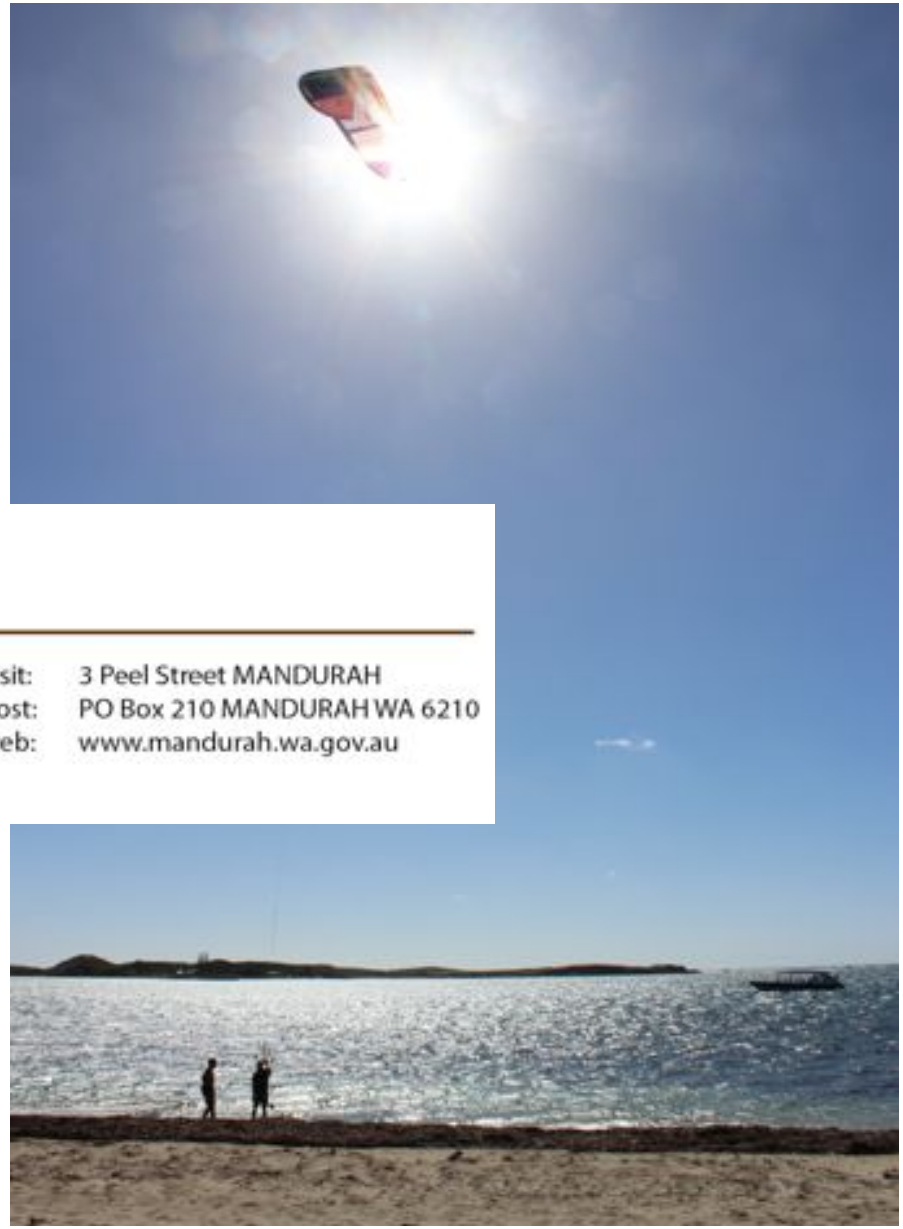
Thank you, any questions?



Peron Naturaliste Partnership

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Coastal Hazard Risk Management and Adaptation Planning Workshop

Shires of Gingin and Dandaragan

8:45 am to 4 pm – July 17th - Ledge Point Country Club (by invitation only)

Objectives

This workshop seeks to identify and explain in the context of Coastal Hazard Risk Management (CHRM):

- Coastal assets at risk and the coastal processes involved
- Data requirements and current knowledge gaps
- Liability and planning issues
- Barriers / opportunities in identifying and responding to risk
- Methods for undertaking CHRM
- Stakeholder communication options

Background

Coastlines respond to a variety of processes such as winds, waves, rainfall runoff, currents, storm surges, and sea level variations. Communities along the Central Coast of WA are primarily located on low lying sandy coastal landforms. Sections of this coastline have been identified in reports commissioned by state government agencies as areas where coastal hazard risk may present a moderate to significant constraint to future coastal management. Existing government policies recognise the risks that may result from these changing processes and encourage coastal managers to develop strategies for managing coastal hazard risk.

The Shire of Dandaragan, Shire of Gingin and the Northern Agricultural Catchments Council have formed a new partnership to take an informed and measured approach to better understand appropriate locations for future development and placement of coastal infrastructure, as well as indicative timeframes to help maximise public and private investment from Guilderton to Jurien Bay

This workshop will help communities along the WA Central Coast to take the first steps in preparing for coastal hazards such as inundation and long term erosion.

Facilitator: Rob Weymouth Western Australian Local Government Association (WALGA)

WORKSHOP AGENDA			
Time	**Item**	**Who**	**Outcomes/Goals**
8:40	Coffee and Networking	All	Relaxed friendly atmosphere.
9:00	Housekeeping / Introductions	Rob Weymouth WALGA - All	Scope of attendees and gauge their anticipated expectations/outcomes.
9:10	Introduction	Shires of Gingin and Dandaragan	Promote and show Shire ownership of process and why they're involved.
PART 1 - IDENTIFYING KEY ASSETS			
9:20	Key Coastal Assets	Chiara Danese - Coastal Focus	What types of natural and man-made assets occur along coastlines and 'could' be at risk? How do we clearly identify assets and 'key' asset areas?
10:10	Discussion	All	Are detailed risk assessments necessary? Prioritising assets to focus limited resources on identifying risk in 'key' asset areas. Prioritisation by understanding services provided by the asset.
10:40	**MORNING TEA 20 MIN**		
PART 2 - IDENTIFYING RISKS TO KEY ASSETS			
11:00	Coastal Hazards and Related Risks	Chiara Danese - Coastal Focus Lindsay Collins - Curtin University Karl Ilich - Department of Transport	What are the main coastal hazards that create risk to assets? Many different coastal processes affect coastal hazards e.g. winds, currents, rainfall, swell, storms, sea levels, tides, sediment movement, geology. How we determine coastal hazards requires a good understanding of these coastal processes. Coastal recession lines, inundation maps and sediment budgets help us identify risk. Dealing with immediate risk (KI).
11:40	Coastal Processes and Data Collection / Analysis	Chiara Danese - Coastal Focus Lindsay Collins - Curtin University	What data sets are needed to understand each of these coastal processes? How are data sets collected for each of these coastal processes? What data sets do we have on each coastal process? How accurate and useful are our data sets? What data sets do we need?
12:10	Discussion	All	What are the barriers and opportunities for gathering these data sets? Resources, partnership arrangements, research linkages and grants? Maximising available resources and accessing further resources.
12:50	**LUNCH 30 MIN**		
PART 3 - INFORMING ACTION ON LIABILITY AND PLANNING PROCESSES			
1:20	Liability and Coastal Planning + Discussion	Garry Middle - Curtin University	What are the liabilities involved in undertaking a CHRM process? How can CHRM and adaptation options be integrated into current planning instruments?
PART 4 COMMUNITY COMMUNICATION AND CREATING COLLABORATIVE PROCESSES			
2:00	Communication Options + Discussion	Joanne Ludbrook - Peron Naturaliste Partnership Chiara Danese - City of Cockburn	How can we effectively inform internal staff and councillors throughout the process? Involving the community in a consistent and transparent approach throughout the process. Strategies for communicating effectively and sensitively with the community. What has been done previously, what worked, what didn't and why?
3:00	**AFTERNOON TEA 20 Min**		
PART 5 WHERE TO FROM HERE			
3:20	Next Steps	Rob Weymouth WALGA	Peer reviewed Workshop Report to summarise presentations, discussions & recommendations, for consideration and adoption by Councils and project partners Discussion on partnership arrangements. Timelines, responsible parties, knowledge limits
3:50	Feedback/Review	NACC	Measurement of success of workshop activities