

**Climate Change Adaptation
Good Practice - Case Study**

Decision Support for Coastal Adaptation Action: The Handbook - Hunter region



About Adaptation Good Practice

Adapting to climate change is a relatively new concept to many. It is important to learn from practitioners who are undertaking adaptation activities that are beginning to have tangible outcomes. Documenting examples of good practice and identifying the criteria that makes them work, enables those interested in adaptation to learn about how to take action.

There are expectations that Adaptation Good Practice (AGP) includes a definite start and finish to a project. However climate change practitioners' experiences show that adaptation projects are often steps in longer learning journeys. There are no golden rules on how to adapt and often practitioners across Australia are inventing the wheel that drives future AGP. This case study of Decision Support for Coastal Adaptation Action: The Handbook – Hunter region is part of

a series of 16 case studies that recognise exemplars for AGP in Australia. Through the development of these stories of successful adaptation it was refreshing to see an emergence of similar experiences and challenges regardless of the project or location. A synthesis of these stories can be seen in the Synthesis Report 'Climate Change Adaptation Good Practice: Key lessons from practitioners experiences', which will help practitioners to understand that they are not alone in their challenges and to see some of the clear lessons learned about what drives good practice in adaptation.

Following the Snapshot there is a more in-depth narrative of the experiences, learnings and network links to stimulate further engagements and knowledge sharing among the growing community of adaptation practitioners.

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Case study snapshot

Quantifying the Cost of Climate Change Impacts

Seven coastal Councils of the Hunter, Central and Lower North Coast region of New South Wales (NSW) identified the need for consistent and transparent decision-making processes to identify management options (including long term adaptation pathways) to address existing coastal hazards and those projected to worsen due to climate change. This project developed a multi-layered decision making approach to engage senior management and professional staff to collaboratively plan for climate change adaptation.

Hunter and Central Coast Regional Environmental Strategy (HCCREMS) coordinated a region wide approach to develop a comprehensive framework to guide decisions. This is represented in the two key outputs of the project, i.e. 'The Handbook and a supporting Workbook'.

The tools assist decision makers to determine appropriate management strategies for identified risks, and to prepare for coastal hazards that are anticipated to worsen due to climate change. The Handbook is also being extended to a broader range of issues. For example, Gosford and Lake Macquarie Councils will work with HCCREMS to apply the Handbook for developing a pilot heat wave plan, using the Handbook as the basis or template.

Additionally, this project provides a leadership model to coordinate regional coastal adaptation decisions across council boundaries and across a range of stakeholders.

The project journey

This project began with a resolve to overcome a frustration felt across seven coastal councils in the HCCREMS: insufficient State and National level frameworks and guidance to assist them to consistently manage existing coastal hazards and those projected to worsen due to climate change. These councils undertook a collaborative project to develop a transparent decision support process and tools that would provide step-by-step guidance for councils.

Within this project's limited time frame, two key outputs, a decision support Handbook and Workbook, were iteratively piloted in five councils, and senior managers from all seven councils were consistently involved throughout.

→ Lesson learnt:

In retrospect, it would have been preferable to test the project outputs within an actual community environment or with elected council officials, and to allocate more time and resources to developing tools to assist councils develop community consultation and engagement plans.

But this simply was not feasible with the available project budget and time frame.

Nevertheless, the learning journey continues. Partner councils are actually applying the tools to facilitate improved decision making. Previously there was no such process available. It is also rewarding to know this project's outputs provide similar practical guidance for other coastal councils across Australia.



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Figure 1: Map of 7 participating councils - Greater Taree, Great Lakes, Port Stephens, Newcastle, Lake Macquarie, Wyong and Gosford.

This project developed a multi-layered decision making approach to engage senior management and professional staff to collaboratively plan for climate change adaptation.

Size or spatial scale

Seven coastal Councils and partners in HCCREMS: Greater Taree, Great Lakes, Port Stephens, Newcastle, Lake Macquarie, Wyong and Gosford.

Drivers for adaptation action

Regional risk assessment processes across Councils clearly identified insufficient existing guidance to assist them with coastal decision-making processes to address climate change impacts. Australian Government funding from the Coastal Adaptation Pathways Program (CAP) enabled this project to proceed.

→ Adaptation action

A consistent and transparent decision-making process to help councils identify management options (including long-term adaptation pathways) for climate change impacts in vulnerable coastal areas. Translates risk assessment outcomes into practical decisions and outcomes.

Risks and impacts addressed

Potential economic, social and environmental impacts arising from:

- Sea level rise
- Coastal recession associated with more frequent or severe storms, storm tides, and changes to coastal currents and other coastal processes
- Changes to extreme rainfall and associated flooding in coastal areas
- Combinations of these events.

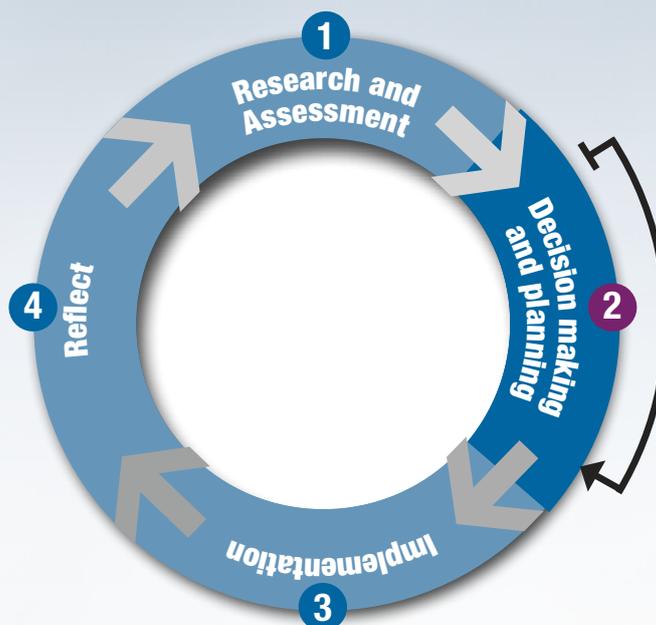


Figure 2: Decision Support for Coastal Adaptation Action: The Handbook - Hunter region Adaptation Good Practice phase

Tangible outcomes

A Handbook and supporting Workbook to guide decisions on managing existing coastal hazards and potentially a broader range of hazards (eg extreme heat events and catchment flooding) projected to worsen due to climate change.

Critical success factors

- Regional leadership and co-ordination provided through HCCREMS
- Multi-layered approach to engage Council General Managers, Directors and professional staff got everyone involved 'on the same page'. All

seven Councils actively participated in designing and testing the Handbook and Workbook

- Applicability: five coastal Councils are already applying or intending to apply the Handbook to coastal planning processes they are currently implementing or due to commence.

The project

The Handbook is a valuable tool for progressing coastal management and adaptation planning. It assists end users to clarify appropriate management strategies identified for climate change risks and possibly included in Corporate Risk Registers. This reflects one of the key objectives of the CAP program: to facilitate a transition from broader scale risk and vulnerability assessment to action. In essence the entire process assists councils, in consultation with their communities, to identify appropriate management responses given the level of risk that has been identified (Stage 4 in the diagram, Figure 3) and with full knowledge of the economic, social and environmental implications of different management options.

The Handbook is primarily intended for use by experienced and entry level council staff including land use, statutory and coastal planners, asset managers and engineers, environmental managers and community planners. Other public decision-makers, including state government departments and public authorities, could also benefit from its application, especially where their decision-making involves interaction with local councils and learning from each other.

What decision support does the Handbook offer?

The handbook outlines ten decision stages and unpacks steps in each stage. Progressing through these stages is likely to be iterative rather than linear, i.e. it may involve moving backwards and forwards between different stages (even skipping some stages altogether), depending on the nature and scale of the issue and decision process.

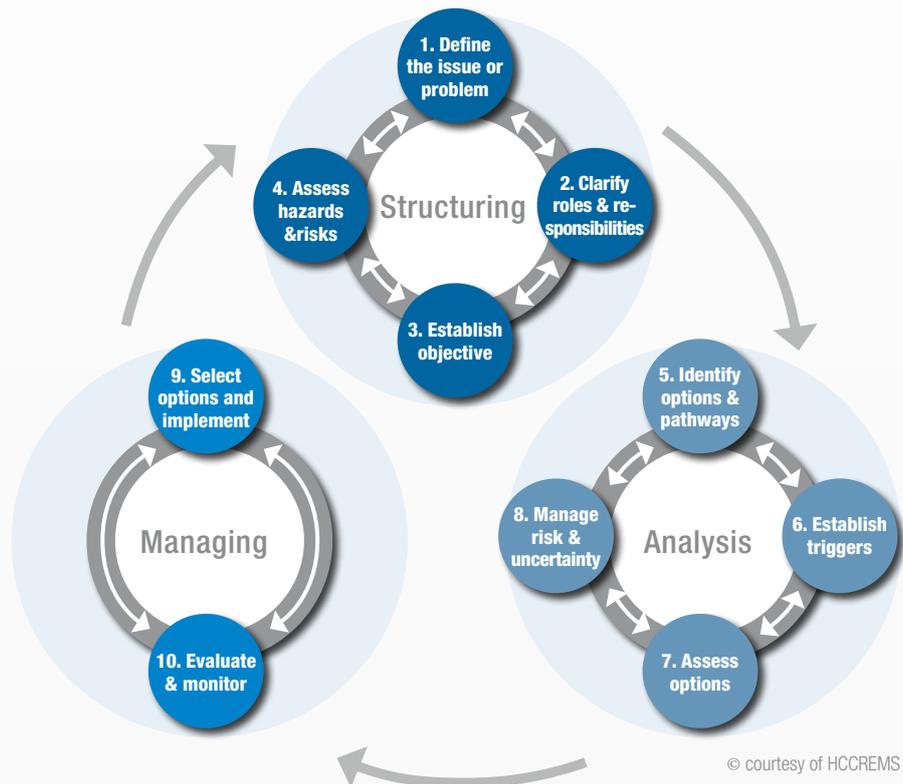


Figure 3: Diagram of 10 adaptation stages in Handbook and Workbook

The Handbook is primarily intended for use by experienced and entry level council staff including land use, statutory and coastal planners, asset managers and engineers, environmental managers and community planners.

Figure 3 shows how the 10 key stages are clustered into three groups: Structuring, Analysis and Managing.

The supporting Workbook provides a summary of the ten major stages in the Handbook, and importantly provides at each stage:

- Checklists of the major steps to be completed and key points to be addressed

- Worksheets to assist decision makers analyse, progress and record key information
- 'Hints' on the implications of responses at particular steps.

Preceding Local Adaptation Pathways Program (LAPP) projects

Coastal Councils Climate

Change Adaptation Plan: a report commissioned by the Hunter and Central Coast Regional Environmental Strategy (HCCREMS November 2010).

This report synthesises previous risk assessment and adaptation planning completed individually by the region's coastal Councils and identifies priority opportunities for collaboration by Councils and other key stakeholders across the region.

Potential Impacts of Climate Change on the Hunter, Central and Lower North Coast of NSW (HCCREMS November 2010). This study provides background information on potential climate change impacts to assist Councils with climate change risk assessments and adaptation planning. It draws on high resolution terrain mapping to analyse exposure and sensitivity of the region to coastal inundation and recession associated with sea level rise and storm surges, and provides an assessment of the most significant market (tangible) and non-market (intangible) costs.

In addition, the then Office of Environment and Heritage (OEH) project from 2008, *Extreme Events on the Coastal Zone*, presented a sectoral case study of historic and projected changes in climate variables, and extreme events in the region.

A backgrounding Discussion Paper, prepared by project partner Marsden Jacobs Associates and released in October 2010, was a key stage in defining the project aims and gaining consensus on the project direction and nature of outputs among the seven coastal Councils.



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[Pasha Bulkar driven ashore at Newcastle by an East Coast Low Pressure System](#)



© Courtesy of City of Newcastle

[Sea water inundation, Carrington \(City of Newcastle\)](#)

Risks and impacts addressed

The issues and decision-making processes for which the Handbook has been designed focus on potential economic, social and environmental impacts arising from the following coastal hazards:

- A Sea Level Rise (SLR)
- Coastal recession associated with more frequent or severe storms, storm tides, and changes to coastal currents and other coastal processes
- Changes to extreme rainfall and associated flooding (rivers and flash flooding) in coastal areas
- Combinations of these events.

The report on *Potential Impacts of Climate Change on the Hunter, Central and Lower North Coast of NSW* (Key Findings p.i) identified the following sectoral impacts on, and vulnerabilities of households, infrastructure, agriculture and ecological communities:

Coastal: impacts

- Sea level rise levels of 0.4 metres by 2050 and 0.9 metres by 2100 were accepted by the previous government in NSW and other states as the benchmark levels for coastal planning and hazard assessments.

vulnerabilities

- More than 400 kms of open coastline in the region are exposed to sea level rise and more frequent and intense storm surges. Half of that length is comprised of sandy shores or muddy shores backed by soft sediments.
- The total extent Australian Height Datum (AHD) of low-lying areas (≤ 2.5 m AHD) is about 40,000 hectares. Of this area approximately 51% are agricultural lands and a further 33% are conservation areas.
- 31,000 households, with a total population of 81,000 people or 8.5% of the region's total population currently reside in these areas. 28% of the households are low income. 23% of the people are aged 65 or over.
- Infrastructure located in low-lying areas includes major roads, railway lines, schools, community facilities and waste facilities.
- More than one third of low-lying coastal areas in the region are conservation areas including endangered and vulnerable ecological communities and high value coastal wetlands.
- Key potential impacts include ecological, amenity and tourism impacts associated with the loss or degradation of beaches, foreshore areas and estuaries.

Response strategy

Key aims and objectives of the Decision Support project include:

- Improve the ability of coastal Councils in the region to implement adaptation approaches in coastal localities vulnerable to the impacts of climate change
- Facilitate a more consistent, transparent, objectives-based approach to decision-making within and across Councils and other stakeholder organisations, regarding land use and asset planning and management in coastal areas
- Transform organisational capacity to adaptively manage the complex interplay of environmental, social, economic and governance factors influencing planning and land use decisions regarding climate change.

Key application targets of the Handbook include informing:

- 'Place based' adaptation planning
- Consistent and effective engagement of local communities and stakeholders in coastal decision-making processes, including demonstrating the process through which adaptation options are determined
- Design and implementation of coastal and flood risk hazard assessments and management plans, and selection of preferred management options
- Design of new assets, renewal or upgrade of existing assets, to improve resilience to climate change.

Implementation phases

1. The Discussion Paper released in October 2010 was one of the first project outputs (Practitioner workshop also held to provide input to direction and content outlined in this paper)
2. Pilot workshops to trial application of the draft Handbook conducted with five Councils from April - June 2012
3. Handbook and supporting Workbook finalised in late 2012.

Challenges and barriers to development and implementation include:

- Tight time frame for the volume of work required to design, pilot and deliver the Handbook and Workbook
- Time constraints associated with Councils piloting the Handbook. Project partners are interested in more extensive piloting that includes facilitation, mentoring and capacity building to assist them to more effectively apply the Handbook to a range of scenarios.

Outcomes achieved

- Achieved the design of systematic decision-support processes
- Successful piloting against real coastal issues and locations to inform final structure and content of the Handbook and Workbook
- Delivery of the Handbook and supporting Workbook.

Applicability is a good indicator that the Handbook and Workbook are making a difference. Five coastal Councils are already applying, or intending to apply the Handbook to meet targets in the coastal planning processes they are currently implementing or due to commence:

Great Lakes Council	Coastal Hazard Management Plans for Boomerang and Blueys beaches.
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Newcastle City Council	Assessment of management options identified in the Newcastle City Wide Flood Plan.
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Lake Macquarie City Council	Development of a Local Adaptation Plans, commencing with the suburb of Marks Point
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Wyong Shire Council	Review of the Wyong Coastal Zone Management Plan, subject to funding.
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Gosford City Council	Subject to funding, review of the potential management options identified in Gosford's Brisbane Water Foreshore – Coastal Floodplain Risk Management Study
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The anticipated outcomes are in

Shorter term: Additional work is being undertaken to produce an electronic, Excel based version of the Workbook and its template-based resources. The **E-Workbook** will provide:

- A more user-friendly, automated step-by-step process for completing the decision-making process
- Improved functionality and integration/linking between the 10 decision stages in the Handbook, and the information underpinning these stages.

The project partners are near to finalising this document.

The longer-term outcomes are:

Wyong Shire and Gosford City Council have applied for funding to mentor and facilitate their professional staff to competently apply the Handbook and Workbook to a variety of scales and contexts.

Emerging outcomes

E-Workbook in design.

Critical success factors

AGP analysis of the project

Success of this approach has been driven by strong leadership and excellent connectivity between all stakeholders.

This project is strong in:

→ **Leadership**

→ **Connectivity**

Leadership

The regional co-ordination provided through HCCREMS effectively engaged staff representing a variety of roles and management hierarchies across all seven Councils and other participating stakeholder organisations.

A multi-layered approach to engaging Council General Managers and Directors and professional staff across these organisations has been critical to getting everyone involved and 'on the same page'.

Professional champions within the Councils helped to drive the project. However, at this stage, community champions and/or stakeholder leaders have not yet contributed to project outcomes.

→ Leadership lesson learnt:

Engage Council General Managers and Directors and professional staff with a multi-layered approach to get all involved 'on the same page'.

Engagement

Engagements with internal partners in the coastal Councils went beyond the 'usual suspects', environmental/ sustainability

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managers, to include asset managers, engineers, corporate planners, spatial analysts and other relevant professional staff.

The Handbook emphasises that 'Effective coastal adaptation decision-making requires a full understanding of the stakeholders who can and should play a role'. And 'a well-considered collaboration, engagement and communication plan will be critical' ... first by designing consultation and engagement processes that are consistent with the requirements of different groups, and second, by pinpointing strategies for engaging and communicating with groups who present a barrier to adaptation.

A number of organisations were involved in the project's design and piloting phases. These included the seven participating coastal Councils, NSW the then Office of Environment and Heritage (OEH), Australian Government Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE), NSW Department of Planning and Infrastructure, Department of Primary Industries (Crown Lands), Hunter Water Corporation and Mid Coast Water.

Wider engagements with local and regional key stakeholder groups have not yet occurred. However, the engagement of key stakeholders is a fundamental

premise of applying the Handbook process.

Partnerships have been reinforced between the region's coastal Councils, and established with the range of government agencies identified above.

Marsden Jacobs Associates were commissioned to deliver the project in collaboration with HCCREMS. They designed and facilitated the consultation, information and pilot workshops and produced the primary publications including Discussion Paper, Literature Review and Consultation Paper, Handbook and Workbook delivered under the project.

→ Engagement lesson learnt:

'Effective coastal adaptation decision-making requires a full understanding of the stakeholders who can and should play a role'.

Connectivity

Systematic relationships are developed between risk assessment, risk management plans, and implementation strategies – which translate into direct actions guided by the Handbook and Workbook.

Transferability is the essence of the Handbook. It can be applied to any coastal management context, irrespective of legislation, and also has

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This project was linked to parallel delivery of another project with similar objectives and intended outputs for the Victorian based regional group of Councils in the South East Councils Climate Change Alliance (SECCCA), which includes Mornington Peninsula Shire Council – see Mornington case study. The CAP funded SECCCA project engaged the same project consultants (Marsden Jacob Associates). A number of key benefits have arisen from communication between the two projects during implementation. These include:

1. Cost efficiencies realised by both projects, i.e. from avoided duplication in literature reviews, facilitation of meetings by Marsden Jacob staff, and development of project resources aiming to meet common objectives - notably the Background Discussion Paper, Handbook and Workbook.
2. Evaluation and testing of the robustness of the Decision Support Framework across both the NSW and Victorian statutory and policy environments.
3. Enabling integration of lessons learned from pilot processes and practitioner engagement implemented across both projects to inform the review and final content of resources across both projects.

The Handbook emphasises that *integrated* decision-making is a key element in whole of organisation approaches e.g. to strategy development, corporate planning and resource allocation.

By leveraging the transferable nature and qualities of the project's key Decision Support outputs, there are potential opportunities for external collaborations with other Regional Organisations of Councils (ROCs), with State Government and Australian Government departments and agencies including OEH and DIICCSRTE, and with industries and corporations with coastal assets.

→ Connectivity lesson learnt:

Integrated decision-making is central to whole of organisation approaches.

Sustainability

The Decision Support processes are focused on long term planning to meet intergenerational needs, and mapping flexible adaptation options over the long-term.

Clarity of purpose and setting firm, manageable objectives are facets of good governance. The Decision Support framework and tools promote these within and across Councils.

As the Handbook is essentially transferable, it has the potential to be rolled out state-wide or potentially nationally.

The Handbook and Workbook provide structured processes to filter and choose the soundest options and abate maladaptations.

→ Sustainability lesson learnt:

The Decision Support processes are focused on long term planning to meet intergenerational needs, and mapping flexible adaptation options over the longterm.

Cost

The framework is designed to be scalable, from small projects such as amenity facilities at beaches to large projects requiring major CBAs for longer-term assets.

The estimated cost of developing the actual Handbook itself was around \$235,000 or roughly 60% of the overall project budget. These costs include writing the document and delivering the pilot workshops to review and modify the product. They do not include the initial project stages of developing the Discussion Paper and Literature Review and Consultation Paper, nor project activities relating to training on its application, or legal review of the draft document.

The project products are available to any end users who want them. There is a relatively small purchase cost of \$75 for a CD that contains all of the project outputs and will also include the Electronic workbook when released.

HCCREMS will not know until August 2013 if funding is secured for the follow-on capacity building projects for professional staff at Wyong and Gosford councils.

However, funding has been secured for development of the E-Workbook.

→ Cost lesson learnt:

Stage 7 in the Handbook provides a framework to choose appropriate cost benefits analysis (CBA) methods for shorter-term tangible and intangible assets that also support long term outcomes.

Conclusion



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Professional staff from project partners 'all in the one room'

This project's key outputs reiterate the value of:

- An objectives-based, clear process for arriving at sound, justified decisions
- Collaborative decision-making
- Early engagement with communities of practice
- Engaging with communities in the justifiable, systematic decision-making process.

Gaps and future challenges

The preceding report on Potential Impacts (p.18) also identified the need for region-wide coastal modelling to provide a more complete understanding of the vulnerability of coastal areas in the region to inundation and erosion.

Other CAP* projects have focused on addressing knowledge gaps regarding complex socio-economic impacts. This project differs in its **focus on developing a 'whole of systems' approach** to identifying, obtaining and evaluating information within an objectives based framework.

For all the partner Councils one of the biggest unresolved information gaps, is finding ways to effectively engage communities in understanding and accepting the veracity of the scientific research and spatial data on impacts and risks, then getting on board and collaborating in the decision-making processes.

A challenge to resolve, going forward, is to engage communities and key stakeholder leaders in:

- Understanding and accepting the veracity of the scientific research and spatial data on impacts and risks (i.e. overcoming climate science scepticism)
- Getting on board and collaborating in the appropriate stages and processes of decision-making.

* HCCREMS. 2010. Analysis of pricing and policy incentives for the roll out of sustainable public lighting across local government in Victoria - Potential-Impacts-Climate-Change-Report.pdf. [ONLINE] Available at: <http://www.hccrems.com.au/hccrems/media/RESOURCES/Climate%20Change/Potential-Impacts-Climate-Change-Report.pdf>. [Accessed 07 May 13].

Links to more information and projects

www.hccrems.com.au

www.hccrems.com.au/hccrems/media/RESOURCES/Climate%20Change/Potential-Impacts-Climate-Change-Report.pdf



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