

## CERMP Application

OVRVIEW	
<b>Submitted on:</b>	Thursday, June 16, 2022 - 11:10
<b>Submitted by (user):</b>	VicDELWP
<b>Recipient Name:</b>	Department of Environment Land Water and Planning
<b>Project Title:</b>	Cape to Cape Resilience Project on-ground works

<b>Project Description Summary:</b>	The Cape to Cape Resilience Project on-ground works will enable adaptation action implementation (blue, green, grey) for the Inverloch region. This follows the planning work completed to date by the Inverloch Regional and Strategic Partnership. The works will reduce disaster risk to critical infrastructure and services for the Inverloch township and surrounding region.
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<b>Project Location Type:</b>	Multi-LGA
<b>State/Territory:</b>	VIC
<b>LGA(s):</b>	<ul style="list-style-type: none"> <li>- Bass Coast</li> <li>- South Gippsland</li> </ul>
<b>Project Location:</b>	Inverloch Region
<b>X Co-ordinates:</b>	
<b>Y Co-ordinates:</b>	

<b>Disaster Type/s:</b>	<ul style="list-style-type: none"> <li>- Coastal Hazard</li> <li>- Estuarine Hazard</li> <li>- Flood</li> <li>- Landslide</li> <li>- Storm</li> </ul>
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<b>Jurisdictional Priority:</b>	Top 10
<b>Project Delivered By:</b>	DELWP, leading the Inverloch Regional and Strategic Partnership.
<b>Length of project:</b>	3 years
<b>Risk Mitigation Targeted by Project:</b>	Both
<b>Project Type:</b>	<ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Nature Based Solution</li> </ul>

<b>Full Project Description:</b>	<p>The Cape to Cape Resilience Project is a coastal hazard adaptation project, overseen by the Inverloch RaSP.</p> <p>Website:  <a href="https://www.marineandcoasts.vic.gov.au/coastal-programs/cape-to-cape-resilience-project">https://www.marineandcoasts.vic.gov.au/coastal-programs/cape-to-cape-resilience-project</a></p> <p>The Inverloch Regional and Strategic Partnership (RASP) is the first RASP established under the Marine and Coastal Act 2018, and has ten partners:</p> <ul style="list-style-type: none"> <li>•Bunurong Land Council Aboriginal Corporation (BLCAC)</li> <li>•Bass Coast Shire Council (BCSC)</li> <li>•Department of Environment, Land, Water and Planning (DELWP) (lead agency)</li> <li>•Department of Transport (DOT)</li> <li>•Gippsland Ports</li> <li>•Heritage Victoria</li> <li>•Parks Victoria (PV)</li> <li>•South Gippsland Shire Council (SGSC)</li> <li>•South Gippsland Water (SGW); and</li> <li>•West Gippsland Catchment Management Authority (WGCMA).</li> </ul>
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The Inverloch RASP is working with the community to address ongoing and future coastal erosion and inundation impacts. This includes delivering the Cape-to-Cape Resilience Project.

The study area is between Cape Paterson and Cape Liptrap. The area of interest includes:

- The open coast from Cape Paterson along the coastal cliffs adjacent towards Inverloch
- The open foreshore and surf beach at Inverloch
- The dynamic estuaries and tidal mudflats of Anderson Inlet
- The open coast and dunes of Venus Bay south to Cape Liptrap
- Inland from the coastline, allowing for assessment of estuary and groundwater impacts.

The overall project includes:

- Short term works: Planning, identification and advocacy for implementation of short term mitigation works while adaptation planning progresses

- Adaptation planning: in accordance with the Victorian Marine and Coastal Policy (2020) directions and Victoria's Resilient Coast – Adapting for 2100+ Guidelines (pilot 2022), including:
  - oNew research through a Coastal Hazard Assessment
  - oExtensive community engagement
  - oA coastal risk and vulnerability assessment
  - oAn economic assessment to inform adaptation
  - oFeasibility modelling for engineering options
  - oCoastal resilience planning.

- Longer term works: Planning, identification and advocacy for implementation of longer-term adaptation actions including on-ground works.

Short term works: Several of the RASP partner agencies have also contributed to the implementation of short term coastal projection works while strategic adaptation planning is progressed. This has been through the Inverloch Coastal Protection Interagency Working Group, who have focused on addressing current erosion at Inverloch and developing a short-term erosion control plan for key areas around Inverloch.

Adaptation planning: To date, the RASP has overseen the delivery of the different components of best practice adaptation planning, including a new Coastal Hazard Assessment (CHA), risk, vulnerability and economics assessments, and feasibility modelling for engineering options.

A list of the reports completed to date towards adaptation planning is provided in Attachment E, aligned to Victoria's statewide approach to best practice coastal hazard risk management and adaptation (Victoria's Resilient Coast – Adapting for 2100+ pilot guidelines – provided in Attachment F).

Longer term works: Over the next 12 months and beyond, the RASP will continue to oversee delivery of a Coastal Resilience Plan including adaptation pathways for different areas of the coast, and a detailed plan of adaptation actions.

The Coastal Resilience Plan will include a suite of actions for long-term adaptation, aligned to Policy directions and best practice approaches.

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	<p>Actions will include a range of avoid, nature based, accommodate, retreat and protect measures in appropriate areas. This will include on-ground works, including nature based and engineering protection works.</p> <p>On-ground works: The proposed program of on-ground works will be refined with the RASP over the next 6 months, and will include a combination of actions that have been tested in the feasibility modelling phase of the planning. Implementation of on-ground works is currently un-funded and will be critical to the implementation of the Coastal Resilience Plan.</p> <p>DELWP and partner agencies have committed substantial funds and in-kind support to the short-term works and adaptation planning components, laying the foundation for strategic adaptation action.</p> <p>The RASP is seeking federal support to implement the on-ground works component of activities that will have significant disaster risk mitigation benefits (from erosion and inundation hazards, for the coast and estuary) long-term.</p> <p>This includes a program of eligible activities including:          -nature based actions including dune management, minor nourishment, wetland restoration -protect actions including major beach nourishment, groynes and/or revetments.</p>
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<b>CERMP funding amount requested:</b>	\$3,300,000
<b>Co-contribution:</b>	\$2,700,000
<b>Estimated Administration Costs:</b>	\$165,000
<b>Total Project Cost:</b>	\$6,000,000
<b>Has financial assistance previously or currently been sought or provided through Commonwealth, State/Territory or other initiatives to support this asset?</b>	No

#### RESPONSES TO SELECTION CRITERIA

<p><b>Response to Assessment Criterion 1:</b></p> <p><i>How the project aligns with the National Disaster Risk Reduction Framework, which will allow a national-level assessment of relative priority across states and territories</i></p>	<p>Alignment to National Disaster Risk Reduction Framework</p> <p>The Cape-to-Cape Resilience Project has strong alignment to the full National Disaster Risk Reduction Framework, including the Sendai Framework Outcome 2030, the Vision for Disaster Risk Reduction in Australia 2030, and the subsequent Goals, Priorities and Guiding Principles of the framework for Australia.</p> <p>2030 Disaster Risk Reduction Goals</p> <p>The creation of the RASP and delivery of adaptation planning aligned to Victoria’s Resilient Coast – Adapting for 2100+ guidelines is actively contributing to the national goals of:</p>
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•Take action to reduce existing disaster risk •Minimise creation of future disaster risk through decisions taken across all sectors •Equip decision-makers with the capabilities and information the need to reduce disaster risk and manage residual risk.

### Framework Principles

#### Priority 1 - Understand disaster risk:

The adaptation planning work undertaken by the RASP in partnership with the community aligns to all elements of Priority 1.

#### The Cape to Cape Resilient project is:

-Actively improving public awareness of risks through active engagement across the project, including sharing of recent coastal hazard mapping -Identifying further data needs and technical barriers (detailed in the CHA reports)

-Integrating future scenarios into planning (including 2040, 2070 and 2100 scenarios)

-Developing cohesive disaster risk information and communication capabilities, through involvement of all RASP partners (sharing of data and risk information, and communication resources across agencies) -Supporting long-term research, innovation and risk education through involvement of RASP partners and links back to academia through DELWP's networks, including the Victorian Coastal Monitoring Program (supporting monitoring of coastal hazard risk long-term) - Supporting improved disclosure of risk to all stakeholders through ongoing input from all RASP partners across all adaptation planning and implementation stages.

#### Priority 2 - Accountable decisions:

The adaptation planning work undertaken by the RASP in partnership with the community aligns to all elements of Priority 2.

#### The Cape to Cape Resilient project is:

-Considering potential avoided loss (tangible and intangible) and broader benefits in all relevant decisions, including through the specific economics assessment undertaken, and multi-criteria approach to the risk assessment - Identifying the highest priority disaster risks and mitigation opportunities (through risk and economic assessments, and adaptation options analysis)

-Building capacity of decision makers through the RASP, where the new disaster risk information will inform new policy, program and management decisions across agencies -Establishing proactive incentives and addressing barriers to reducing disaster risk, through RASP knowledge sharing and establishing a joint approach that is fit for purpose and support agencies towards implementation - Maintaining planning and development practices that enable adaptation to rapid change (social, economic, environmental), through implementing a pathways approach to adaptation with appropriate triggers for changes in action/pathways/review -Promoting compliance with relevant standards, codes and specifications, including through alignment with Victoria's Resilient Coast – Adapting for 2100+ guidelines which follow national best practice approaches for coastal hazard risk and resilience, including a framework after the national Coast Adapt model, embedding the Australian Standard for risk (ISO 31000:2018), and best practice for strategic risk and economic assessments.

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	<p>Priority 3 - Enhanced investment: The Cape to Cape Resilience Project will produce a Coastal Resilience Plan that will include consideration of all elements of Priority 3, including:</p> <ul style="list-style-type: none"> <li>-Potential for collaborative commercial financing</li> <li>-Risk reduction investment tools and guidance</li> <li>-Leveraging existing and future government programs</li> <li>-Identifying additional current and future funding streams</li> <li>-Improving the accessibility, variety and uptake of insurance</li> <li>-Empowering communities, individuals and small business to make informed and sustainable investments.</li> </ul> <p>Priority 4 - Governance, ownership and responsibility: The adaptation planning work undertaken by the RASP in partnership with the community aligns to all elements of Priority 4.</p> <p>The Cape to Cape Resilience Project will:</p> <ul style="list-style-type: none"> <li>-Provide learnings from the RASP model to support the establishment of a national mechanism to oversee and guide disaster risk reduction across cross-sector dependencies</li> <li>-Provide learnings to support a national implementation plan</li> <li>-Support and enable locally-led and owned place-based disaster risk reduction efforts – this is a core purpose of the RASP and the Cape to Cape Resilience Project.</li> <li>-Incentivise improved transparency of disaster risk ownership through personal and business transactions, through supporting community led response and actions</li> <li>-Consistently report on disaster risk reduction efforts and outcomes through RASP implementation of actions</li> <li>-Contribute to creation of clear governance pathways for disaster risk reduction projects as the RASP progresses through implementation.</li> </ul> <p>Guiding Principles</p> <p>The creation of the RASP and delivery of adaptation planning aligned to Victoria’s Resilient Coast – Adapting for 2100+ guidelines is actively implementing all the guiding principles of:</p> <ul style="list-style-type: none"> <li>-Shared and defined responsibilities</li> <li>-Cultural change</li> <li>-Integrated action</li> <li>-Inclusive engagement.</li> </ul> <p>This is enabling practical change a local and state levels, and will provide key learnings to inform national levels in:</p> <ul style="list-style-type: none"> <li>-Continual improvement</li> <li>-Data-driven decision making</li> <li>-Leadership.</li> </ul>
<p><b>Response to Assessment Criterion 2:</b></p> <p><i>The relative coastal and estuarine hazard associated disaster risk to be mitigated by the project. Specifically:</i></p> <ul style="list-style-type: none"> <li>• <i>an indication of the risk before and after the proposed project;</i></li> </ul>	<p>Known coastal hazard risk:</p> <p>Three key outputs of the Cape-to-Cape Resilience Project contribute to the appreciation of current and potential future coastal hazard risk:</p> <ul style="list-style-type: none"> <li>-Inverloch Region Coastal Hazard Assessment (CHA) maps on website: <a href="https://www.marineandcoasts.vic.gov.au/coastal-programs/cape-to-cape-resilience-project">https://www.marineandcoasts.vic.gov.au/coastal-programs/cape-to-cape-resilience-project</a></li> <li>-Risk and Vulnerability Assessment</li> <li>-Economic analysis.</li> </ul>

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<ul style="list-style-type: none"> <li>• <i>the risk assessment methodology used to determine the project risk rating;</i></li> <li>• <i>how the project has been prioritised and designed to:</i> <ul style="list-style-type: none"> <li>○ <i>avoid exacerbating and/or reduce current risks;</i></li> <li>○ <i>avoid creating new risks; or</i></li> <li>○ <i>avoid maladaptive consequences, including negative social and environmental outcomes; and</i></li> <li>○ <i>a description of the mitigation impact of the proposed project and how the project will enable adaptation to future climate and disaster impacts.</i></li> </ul> </li> </ul>	<p>The context of these reports in the Cape to Cape deliverables is listed in Attachment F, the reports are currently being finalised and can be provided on request. A summary of key points is incorporated below.</p> <p>Risk before and after the proposed project:</p> <p>The Risk and Vulnerability Assessment report provides a detailed consideration of risk, informed by the coastal hazard assessment, a cultural values study, community values study, and best practice for a strategic approach to risk assessments.</p> <p>Coastal hazard exposure (likelihood) and consequence, for a diversity of coastal values and uses, is embedded into the risk assessment. Following the detailed analysis in the report, a summary graphic of the overall risk profile is shown in Attachment B with the Business Case.</p> <p>Areas of medium, significant and high risk are the priority focus areas for risk mitigation and adaptation planning action.</p> <p>After the work of the Cape to Cape project is completed, it is expected that the med to high risks will be reduced and mitigated to acceptable levels.</p> <p>Risk methodology:</p> <p>The method for the risk assessment is in alignment with Victoria’s Resilient Coast – Adapting for 2100+ guidelines which follows national best practice approaches for coastal hazard risk and resilience, including the Australian Standard for risk (ISO 31000:2018), and is aligned to DELWP’s risk management framework. Graphics illustrating key components of the risk method are included in Attachment C with the Business Case.</p> <p>Project design:</p> <p>The project has been prioritised and designed to:</p> <p>oavoid exacerbating and/or reduce current risks oavoid creating new risks oavoid maladaptive consequences, including negative social and environmental outcomes.</p> <p>This is achieved through implementation of Victoria’s Resilient Coast – Adapting for 2100+ guidelines which provide direction on the evaluation of risk mitigation / adaptation actions. Actions are considered through multi-criteria analysis, participatory stakeholder engagement, and economic considerations, to ensure selected actions are appropriate. Implementation through a pathways approach, with a long-term view (to 2100) also ensures maladaptive actions are avoided.</p>
<p><b>Response to Assessment Criterion 3:</b></p> <p><i>The direct and broader benefits from the proposed project. Specifically, the avoided impacts and costs through a suite of</i></p>	<p>Direct and broader benefits from the project</p> <p>Impact / cost of hazards:</p> <p>The Risk and Vulnerability, and Economic analysis reports provide detailed consideration of the direct and broader benefits of adaptation for the Inverloch area. A summary of key points is provided below, and graphics have been included in Attachment C with the Business Case.</p>

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<p><i>counterfactuals (if a disaster happened, how much would it have cost), and the value created by the project. This should include any relevant environmental, social and economic benefits of the project (e.g. greater tourism activity, improved ecosystem services, community health and well-being) that support local and regional resilience and adaptation to climate change.</i></p>	<p>Infrastructure: In the absence of adaptation, the combined economic impact of all coastal hazards (erosion, storm tide inundation, permanent inundation) for infrastructure assets is expected to be in the order of \$2 million dollars per year (present day), and increasing to over \$15 million dollars per year by 2100. This includes impacts to critical assets/services including buildings and facilities, transport, utilities, beach and foreshore assets and agriculture.</p> <p>Natural assets: Additional elements of the assessment indicate that economic impacts (damages) of coastal hazards for natural assets, based on an ecosystem services approach, is expected to be in the order of \$2 million dollars per year (present day), and in excess of \$7 million dollars per year by 2100.</p> <p>Local economic impacts: An additional element to the economic assessment the potential coastal hazard impact on the local economy including potential impacts on tourism, beach use, and property value.</p> <p>The analysis indicates, in the event the Inverloch sandy surf beach is permanently eroded (loss of sandy beach and current uses):</p> <ul style="list-style-type: none"> <li>-That a 5 – 20% reduction in visitation to the Inverloch surf beach (if eroded long-term) could align to a reduction in local tourism expenditure of \$2 million to \$80 million per year</li> <li>-The estimated cost for locals for accessing alternative beaches is estimated between \$2 million and \$7 million per annum</li> <li>-There may be a potential loss of priority value in the order of 29% - 37% depending on distance from the shoreline.</li> </ul> <p>Value created by project:</p> <p>With effective implementation of adaptation measures, the potential value created by the Cape to Cape Resilience project, including on-ground works, includes:</p> <ul style="list-style-type: none"> <li>-\$2 - \$15 million per annum on mitigated infrastructure damages</li> <li>-\$2 - \$7 million per annum on mitigated natural asset damages</li> <li>-\$4 - \$80 million per annum on mitigated local economic impacts.</li> </ul> <p>In addition, the Cape to Cape Resilience project will contribute to protecting and enhancing the range of important coastal values and uses across the Inverloch region. These values (detailed in the Risk and Vulnerability report) are summarised in the graphic included in Attachment C Business Case, and include a diverse range of environmental, cultural, social and economic benefits of the project.</p> <p>The Cape to Cape Resilience project, including the on-ground works component, is fundamental to supporting support local and regional resilience and adaptation to climate change.</p>
<p><b>Response to Assessment Criterion 4:</b></p> <p><i>Why this project is unlikely to be funded through other funding sources, including but not limited to other funding sources within the</i></p>	<p>Funding</p> <p>DELWP and RASP partner agencies have committed substantial funds and in-kind support to the short term works and adaptation planning components to date, laying the foundation for strategic adaptation action.</p> <p>Finalising of the Coastal Resilience Plan will occur within the next 12 months, and there is a need for on-ground works to commence as soon as possible over</p>

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<p><i>NRRA, i.e. applications submitted for other funding sources including government, non-government and philanthropic.</i></p>	<p>the next 2 years to mitigate potential disaster risk if a major erosion / inundation event were to occur in the near future (which is possible as shown from the new hazard mapping).</p> <p>With current State and Local Government and agency budget constraints, it is unlikely that there will be funds available to commence implementation of major on-ground works within the next 2 years in the preferred proactive / resilience building (rather than post-event recovery) approach.</p> <p>There are no other appropriate funding sources available at this time (non-government or philanthropic).</p>
<p><b>Response to Assessment Criterion 5:</b></p> <p><i>Evidence of consultation and collaboration with the community, local government and any other relevant stakeholders (e.g. Traditional Owners and Custodians) to define the problem and develop a proposed solution. Specifically:</i></p> <ul style="list-style-type: none"> <li>• <i>any consultations undertaken (such as direct correspondence with stakeholders or community survey results) with relevant local governments, communities and any other relevant stakeholders in reference to each project submitted. The outcomes of those consultations (if any) must be provided; and</i></li> <li>• <i>that they have consulted with Local Government Associations about the availability of the Program in the jurisdiction.</i></li> </ul>	<p>Consultation</p> <p>The Cape to Cape Resilience Project is underpinned by an extensive engagement program including:</p> <ul style="list-style-type: none"> <li>•The Regional and Strategic Partnership (the ten partner agencies including relevant Local Governments)</li> <li>•A Project Working Group (select agency representatives)</li> <li>•A Technical Reference Group (select agency representatives)</li> <li>•A Stakeholder Reference Group (community organisation representatives and individuals)</li> <li>•Community engagement program – surveys, drop-in sessions, communication materials.</li> <li>•A project website with a range of communications materials (FAQs, project updates, fact sheets) and information - <a href="https://www.marineandcoasts.vic.gov.au/coastal-programs/cape-to-cape-resilience-project">https://www.marineandcoasts.vic.gov.au/coastal-programs/cape-to-cape-resilience-project</a></li> <li>•Online portal (Engage Victoria Cape to Cape Resilience Project   Engage Victoria) for engagement activities</li> <li>•Cultural values study and community values study.</li> </ul> <p>All these groups and elements of the engagement program have underpinned the problem definition (scoping the Cape to Cape Resilience project) and are contributing to developing the proposed solutions including the program of on-ground works.</p> <p>The RASP and Inverloch community are strong advocates for delivering on-ground works as part of the Coastal Resilience Plan.</p> <p>Evidence and outcomes from community consultations are embedded across the relevant project reports (and in materials on the project website).</p> <p>The Municipal Association of Victoria (Local Government Association) is aware and supportive of the Cape to Cape Resilience Project, with two Local Governments involved in the project.</p>
<p><b>Response to Assessment Criterion 6:</b></p> <p><i>The likelihood of project success, including evidence of capacity to complete the project to meet industry standards, to deadline and</i></p>	<p>Likelihood of project success</p> <p>With the established cross-sector RASP led by DELWP, and existing momentum of the best practice adaptation planning underway at Inverloch, the implementation of the on-ground works component has strong likelihood of success. This includes meeting industry standards, deadlines and budgets.</p> <p>The project is strongly aligned to existing interrelated Victorian Policy and Strategy including:</p>

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<p><i>within estimated budget. Specifically:</i></p> <ul style="list-style-type: none"> <li>• <i>how the project aligns it to any existing interrelated strategies, such as coastal and estuarine management plans (if relevant);</i></li> <li>• <i>evidence of capacity and capability and previous experience in undertaking similar scale projects;</i></li> <li>• <i>the potential for maladaptation through the project (including any potentially negative social, environmental or economic outcomes) and how these will be avoided or managed; and</i></li> <li>• <i>an assessment of value for money.</i></li> </ul>	<p>-The Victorian Marine and Coastal Policy (2020) and Marine and Coastal Strategy (2022). The project aligns to delivering key actions in the new 5 year Strategy.</p> <p>-Victoria's Resilient Coast – Adapting for 2100+ Guidelines. The project aligns to the framework stages and direction in the guidelines.</p> <p>-Build Environment Adaptation Action Plan (2021). The project aligns to delivering on key actions within the adaptation action plan.</p> <p>The project is being led by DELWP staff with significant experience in the delivery of similar scale projects, and is linking in with capacity and capability building initiatives being delivered through Victoria's Resilient Coast – Adapting for 2100+ program.</p> <p>The potential for maladaptation (cultural, social, environmental, economic) through the project is limited through:</p> <p>-Alignment to Victoria's Resilient Coast – Adapting for 2100+ guidelines, including a pathways approach to adaptation -Regular guidance and input from the RASP -Strong strategic adaptation planning providing the foundation for on-ground works.</p> <p>Value for money will be delivered through best practice approaches, timely and on-budget delivery, and achievement of project objectives alongside learnings for adaptation and disaster risk reduction nationally.</p>
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### ATTACHMENTS

<b>1</b>	<b>Details of consultation with community (optional):</b>	<i>Yes</i>
<b>2</b>	<b>Business case:</b>	Yes
<b>3</b>	<b>Indicative budget:</b>	Yes
<b>4</b>	<b>Project Management Plan:</b>	Yes
<b>5</b>	<b>Ministerial Endorsement:</b>	Yes
<b>6</b>	<b>Other attachments (optional):</b>	Yes - 2

### OTHER

<b>Other relevant consideration and information:</b>	<i>Nil</i>
<b>Project Contact:</b>	<p>s22 [REDACTED]</p> <p>Land &amp; Built Environment - Gippsland Region Forest, Fire and Regions Department of Environment, Land, Water and Planning <a href="mailto:capetocape.project@delwp.vic.gov.au">capetocape.project@delwp.vic.gov.au</a></p> <p>s22 [REDACTED]</p>
<b>Reference (Office Use Only)</b>	CERMP000233

# Attachment C

# Business Case

Project: Cape to Cape Resilience Project - on ground works

## Business Case

As outlined in the project application, with effective implementation of adaptation measures, the potential value created by the Cape to Cape Resilience project, including on-ground works, includes the following, which are detailed in the economic analysis report.

- \$2 - \$15 million per annum on mitigated infrastructure damages
- \$2 - \$7 million per annum on mitigated natural asset damages
- \$4 - \$80 million per annum on mitigated local economic impacts.

**Biophysical change**

- Erosion of beach  
e.g. metres lost per year.

**Resulting changes in use or amenity**

- Lower visitation  
e.g. tourists no longer come, locals go to nearby alternatives instead.
- Reduced amenity  
e.g. beach views impacted.

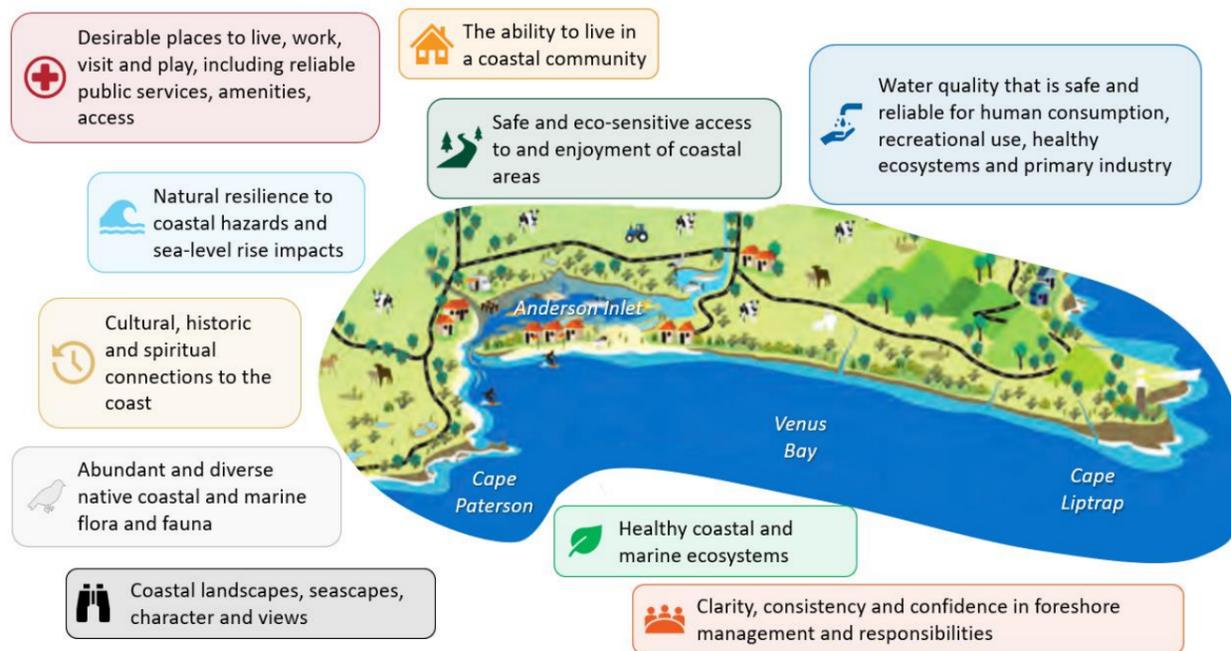
**Valuation of impacts to local areas**

- Reduced economic contribution of tourism to local economy.
- Increased costs for locals to access alternatives.
- Reduced property values.

**Cultural**  
In addition, the Cape to Cape Resilience project will contribute to protecting and enhancing the range of important coastal values and uses across the Inverloch region. This will be achieved by reducing the risk (likelihood and consequence) of coastal hazard exposure for the diversity of values and uses in addition to critical infrastructure.

**Environmental**  
These values (detailed in the Risk and Vulnerability report) are summarised in the graphic below and include a diverse range of environmental, cultural, social and economic benefits of the project. A summary of the risk assessment outcomes and core elements of the methodology are also provided below for reference. Adaptation will be targeted at med-high risk areas, and deliver the associated benefits of mitigating risk for community and lifestyle, the environment, place and planning.

**Social**



		Erosion				Storm tide inundation				Permanent inundation			
		0.0 m	0.2 m	0.5 m	0.8 m	0.0 m	0.2 m	0.5 m	0.8 m	0.0 m	0.2 m	0.5 m	0.8 m
Sea level													
Planning horizon		Present day	2040	2070	2100	Present day	2040	2070	2100	Present day	2040	2070	2100
Inverloch		Med*	Sign*	Sign	High	Med	Med	Sign	Sign	Low	Low	Med	Med
Bass Coast Shire (ex. Inverloch)		Low	Low	Low	Med	Low	Med	Med	Sign	Low	Low	Low	Med
South Gippsland Shire		Low	Low	Med	Med	Med	Med	Sign	Sign	Med	Med	Sign	Sign

\* at some locations within the area



		Consequence				
		Negligible	Minor	Moderate	Major	Extreme
Likelihood	Likely	Medium	Medium	Significant	High	High
	Possible	Low	Medium	Significant	Significant	High
	Unlikely	Low	Medium	Medium	Significant	Significant
	Rare	Low	Low	Medium	Medium	Significant

Risk	Risk tolerance	Action required
High	High risk: a risk that, following an understanding of likelihood and consequence, is so high that it requires actions to avoid or reduce the risk.	Immediate and/or ongoing action is needed to treat, eliminate, or reduce risk to acceptable levels
Significant	Medium to significant risk: a risk that, following an understanding of likelihood and consequence, is low enough to allow the exposure to continue, and at the same time high enough to require new treatments or actions to reduce the risk. Society can live with this risk but believe that as much as is reasonably practical should be done to reduce the risks further.	Short term action is needed to treat, eliminate, or reduce risk to acceptable levels
Medium		Short to longer term action is needed to treat, eliminate, or reduce risk to acceptable levels
Low	Low risk: a risk that, following an understanding of likelihood and consequence, is sufficiently low to require no new treatments or actions to reduce the risk further. Individuals and society can live with this risk without feeling the necessity to reduce the risks any further.	Manage and monitor the risk as part of current operations, provide for periodic maintenance/review.

Consequence	Community and lifestyle			Environment	Place and planning		
	Lifestyle	Access	Public safety	Environmental values	Cultural landscapes	Property and infrastructure	Economy and growth
Extreme	Considers lifestyle elements of modern and traditional lifestyle such as community services, cultural connection, recreational and social activities and day to day business activities.	Considers access for recreational activities such as boating and fishing, nature-based activities as well as access to cultural and ceremonial sites.	Considers threats to human health and safety such as injury, disease, mental and physical well being.	Considers elements such as ecological values, ecosystem services, and cultural and traditional uses.	Specific consideration of traditional cultural values and the ability to maintain and pass on traditional knowledge and practices to future generations	Considers the threat of damage to built assets and any interdependencies such as regional access and ability to deliver critical services	Includes existing business and potential economic growth opportunities, especially for locally owned and operated enterprises.
Major	Widespread semi-permanent impact (~1 year) to highly utilised community services, wellbeing, or culture of the community with no suitable alternatives.	Widespread and permanent impact on access to key sites and activities	Loss of lives and/or permanent disabilities.	Severe and widespread, permanent impact on multiple regionally or nationally significant environmental values of the region.	Severe and widespread, permanent impact on multiple sites of cultural significance, including loss of land, connection to land, and ability to continue traditional practices.	Widespread major damage or loss of property or infrastructure with total value >\$25 million.	Regional economic decline, widespread business failure and impacts on state economy.
Moderate	Major widespread long-term (~1 month) disruption to well-utilised services, wellbeing, or culture of the community with very few alternatives available.	Severe and semi-permanent impact on access to key sites and activities	Widespread serious injuries/illnesses.	Recovery unlikely.	Recovery unlikely.	Major damage or loss of property or infrastructure with total value >\$10 million.	Lasting downturn of local economy with isolated business failures and major impacts on regional economy.
Minor	Minor medium-to long-term (~1 week) or major short-term disruption to moderately utilised services, wellbeing, or culture of the community with limited alternatives.	Substantial impact on access to key sites and activities requiring significant works to repair or restore access.	Isolated serious injuries/illnesses and/or multiple minor injuries/illnesses.	Full recovery may take many years.	Full recovery may take many years.	Full recovery/repair may take several years.	Significant impacts on local economy and minor impacts on regional economy.
Negligible	Small to medium short-term disruption (~1 day) to moderately utilised services, wellbeing, finances, or culture of the community with some alternatives available, or more lengthy disruption of infrequently utilised services.	Full recovery may take less than 1 year.	Minor and isolated injuries and illnesses.	Small, contained and reversible short-term impact on isolated ecosystem services and natural features of the region.	Small, contained and reversible short-term impact on sites of cultural significance.	Moderate - major damage to property or infrastructure with total value >\$1 million.	Individually significant but isolated impacts on local economy.
	Very small short-term disruption (~1 hour) to services, wellbeing, finances, or culture of the community with numerous alternatives available.	Very little to no impact on access to key or sensitive sites and activities.	Negligible injuries or illnesses.	Full recovery may take several years.	Full recovery may take several years.	Minor damage to properties or infrastructure with total value >\$100,000.	Minor short-term impact on local economy.
				Little to no environmental impact.	Little to no impact to sites of cultural significance.	Minimal damage to properties or infrastructure with total value <\$100,000.	



# Attachment A

# Project Budget

**Project:** Cape to Cape Resilience Project - on ground works

## Project Budget

Deliverable	Timeframe	Total project budget	Federal contribution	Co-contribution
<b>Short term works</b> Funds invested by RASP project partners into short term erosion mitigation response works	2019 - 2020	\$1.5M		\$1.5M
<b>Adaptation planning &amp; longer term works</b> Funds invested by DELWP into adaptation / resilience planning, including RASP establishment and progression, delivery of technical investigations, and finalising and implementing a Coastal Resilience Plan including RASP-agreed on-ground works program. Note additional in-kind time also provided across project partners (not costed).	2020 - 2022	\$1.2M		\$1.2M
<b>On-ground works</b> Detailed design, approvals and construction of on-ground works components of the RASP-agreed Coastal Resilience Plan.	Dec 2022 - Dec 2024	\$3.3M	\$3.3M*	
<b>TOTAL</b>		<b>\$6.0M</b>	<b>\$3.3M</b>	<b>\$2.7M</b>

\* ink 5% admin costs = \$165,000

Note federal funding only aligns to eligible activities (no wages or ineligible activities)

# Attachment B

# Project Management Plan

Project: Cape to Cape Resilience Project - on ground works

## Project Management Plan

### Key project risks and controls

Risk	Project control
Project not delivered on time or budget	DELWP leading on the project enables strong oversight and direction to support on-time and on-budget delivery. Systems are in place to facilitate RASP discussions and endorsements, and to continue with efficient project delivery. A range of approaches have been developed to progress projects through COVID (online models, tools etc) and can continue to be used to ensure timely delivery of critical milestones.
Project not supported by stakeholders and community	The extensive engagement approach underpinning work to date will continue (RASP and community engagement), and will also be reviewed and adjusted to improve the model where there is opportunity to do so.
Project not supported by Local and State Government (loss of political support)	The RASP model (as a statutory tool under the Marine and Coastal Act) provides a strong mechanism to ensure support and endorsement of Local and State Government. The collaborative work of the RASP will ensure recommendations put up for endorsement have in-principle support from all partners, including Local and State Government, prior to endorsements. The collaborative engagement process underpinning the Cape to Cape Resilience project will support internal engagement required for Local and State support as well.

### Monitoring and evaluation

Action	Timing
Is delivery of the project plan and activities on track?	Monthly dashboard monitoring of key tasks, timing and delivery progress, including key project risks and mitigation actions required.
Is delivery of the communication and engagement plan and activities on track?	Review at completion of each stage to evaluate, update and refine the approach.
Is the RASP performing as expected, and is there opportunity for improvements in the model?	Review prior to commencing the on-ground works delivery stage, and after each 12 month period.

RaSP member	Reason for selection
 Department of Environment, Land, Water, and Planning	Lead partner agency
 Bunurong Land Council Aboriginal Corporation	Registered Aboriginal Party - Traditional Owner responsible for representing Bunurong community and protecting cultural and heritage values
 Department of Transport	Manager of adjacent land and infrastructure affected by erosion
 Bass Coast Shire Council	Local Government authority and land manager for parts of the affected coast
 Heritage Victoria	Manager of non-Indigenous heritage places including the historic shipwreck Amazon (1863)
 Gippsland Ports	Anderson Inlet waterway manager
 Parks Victoria	Local land manager for parts of affected coast
 South Gippsland Shire Council	Local Government authority and land manager for parts of affected coast
 South Gippsland Water	Manager of land and infrastructure affected by erosion
 West Gippsland Catchment Management Authority	Agency responsible for providing coastal erosion advice under the <i>Marine and Coastal Act 2018</i>



Hon Lily D'Ambrosio MP

Minister for Energy, Environment and Climate Change  
Minister for Solar Homes

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Ref: MBR047678



The Hon Murray Watt  
Minister for Emergency Management  
Minister for Agriculture, Fisheries and Forestry  
Parliament House  
CANBERRA ACT 2600

Dear Senator

**VICTORIAN FEDERAL GRANT APPLICATION: COASTAL AND ESTUARINE RISK MITIGATION PROGRAM 2022-2023**

I am writing to you as the Minister with policy responsibility for disaster risk reduction in relation to coastal hazards in Victoria. I endorse the projects put forward in the Victorian application for the Coastal and Estuarine Risk Mitigation Program 2022-23. Those being:

- Cape to Cape Resilience Project on-ground works
- Victorian estuary resilience and hazard risk reduction
- Contaminated soil and coastal hazard disaster risk
- Statewide coastal hazard mapping
- Mainstreaming nature-based adaptation in Victoria
- Traditional Owner cultural values and adaptation options
- South Gippsland Shire - levees review and infrastructure planning
- Mechanisms to support planning for Victoria's coastal settlements
- Victorian Coastal Monitoring Program early warning system and sentinel sites
- Port Phillip North-Western Shoreline coastal hazard adaptation planning.

These projects have been selected in consultation with relevant Victorian State Government departments, local government, Registered Aboriginal Parties, Catchment Management Authorities, and other interested stakeholders.

I look forward to the outcome of this grants program and continuing to work collaboratively with the Australian Government on this important matter.

Should you have any questions, please contact [s22](#), Project Manager, Victoria's Resilient Coast, Department of Environment, Land, Water and Planning, on [s22](#) or at [s22@delwp.vic.gov.au](mailto:s22@delwp.vic.gov.au).

Yours sincerely

**Hon Lily D'Ambrosio MP**  
**Minister for Energy, Environment and Climate Change**  
**Minister for Solar Homes**

16 / 06 / 2022



# Victoria's Resilient Coast - Adapting for 2100+

## PILOT Guidelines

*A statewide approach to coastal hazard risk management and adaptation*



February 2022 - Confidential document – Not for circulation beyond invited parties

## Acknowledgements

*Victoria's Resilient Coast – Adapting for 2100+* project team would like to acknowledge the contributions of the Traditional Owner project partnership, Department of Environment, Land, Water and Planning (DELWP) Working Group, Collaborative Working Group, and consultant contributions to the framework development and relevant sections of the guidelines.

## Author

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## Content contributions:

Water Technology – Stage 3, Attachment A

BMT – Stage 5, Attachment B

Deakin University (Blue Carbon Lab) – Stage 5

Alluvium and Natural Capital Economics – Stage 1, 5, Attachment C

## Editor

## Photo credit

### Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



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Printed by <Insert Name of printer - Suburb>

ISBN XXX-X-XXXXX-XXX-X (print) [How to obtain an ISBN or an ISSN](#)

ISBN XXX-X-XXXXX-XXX-X (pdf)

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## Acknowledgement of Aboriginal Victorians<sup>1</sup>

Traditional Owners have an unbroken custodianship of the land and seas that extends back tens of thousands of years. Their knowledge, understanding, and relationships to Country are fundamental to the health of the environment and the success of any strategy to manage that environment.

Traditional Owners' deep and living relationship with the land and sea, and its resources, is evident in their cultures and in their unique connection to Country. Country is the water, the land and everything that these encompass. It is woven into the fabric of Aboriginal lore, language, governance, and wellbeing. Country embodies culture. Ecosystem health is therefore critical to safeguarding and protecting Aboriginal cultures, and the practice of culture is critical to the health of Country.

Traditional Owners have never surrendered rights to Country. The Victorian Government acknowledges Aboriginal people as Australia's first people, and as the Traditional Owners and custodians of the land on which we work and live. We recognise the strength of Aboriginal people and the need for reconciliation and genuine partnerships to address the negative impacts of the past.

We recognise and value the ongoing contribution of Aboriginal people and communities to Victorian life and how this enriches us all. We recognise that Aboriginal cultures and communities are diverse, and the value we gain in celebrating these cultures and communities. We embrace the spirit of reconciliation, working towards the equality of outcomes and ensuring an equal voice. We have distinct legislative obligations to Traditional Land Owner groups that are paramount in our responsibilities in managing Victoria's resources.

---

<sup>1</sup> Marine and Coastal Strategy (draft 2021)

# Introduction

This section introduces foundational elements of our statewide approach to coastal hazard risk management and adaptation, including:

- Guideline purpose
- Framework and guideline stages
- Program collaborative development
- Policy context
- Coastal hazards
- Adaptation context
- Roles in coastal hazard adaptation
- Where these guidelines apply
- How to use these guidelines.

## Guideline purpose

Victoria has over 2,500 km of coastline, including extensive sandy beach systems, rocky coasts, bays, inlets and estuaries, coastal lakes and floodplains. These diverse cultural landscapes have been nurtured by Traditional Owners of Country for countless generations, and are dynamic environments shaped by natural coastal processes.

At times, coastal processes including erosion, inundation, and other physical/chemical processes, may have a negative impact on coastal values and uses. When this occurs, we often refer to these processes as coastal hazards.

Coastal hazard exposure occurs periodically across the coast and is projected to increase with changes in wave action, storm activity and sea level rise associated with climate change.

*Victoria's Resilient Coast – Adapting for 2100+* provides a statewide approach to coastal hazard risk management and adaptation.

This includes a framework, guidelines, and support for Local Government, land managers and communities to:

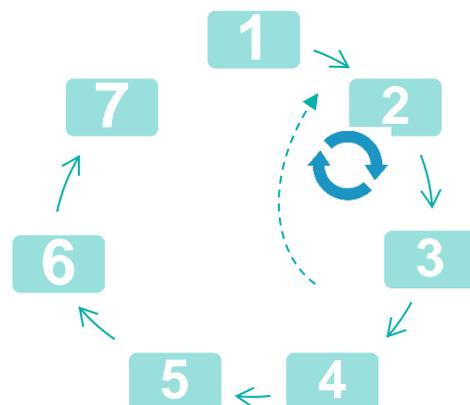
- Enable place-based, best practice and long-term coastal hazard risk management and adaptation
- Build on the directions in the Marine and Coastal Policy 2020.

## Framework and guideline stages

*Victoria's Resilient Coast* framework and guidelines (this document) provide a staged approach to the technical, strategic and engagement elements of managing coastal hazard risk and adaptation planning (Table 1, Figure 1). The seven stages correspond to the chapters of these guidelines.

**Table 1. Victoria's Resilient Coast – Adapting for 2100+ framework stages**

Stage		Embedded in all stages
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	
Stage 4	Vulnerability and risk	Collaborative process
Stage 5	Adaptation actions and pathways	Engagement and communication
Stage 6	Plan and implement	
Stage 7	Ongoing monitoring and review	



**Figure 1. Victoria's Resilient Coast – Adapting for 2100+ framework stages<sup>2</sup>**

<sup>2</sup> Note – placeholder diagrams only. Graphic design of iterative framework (table and diagram) is currently in development

The guidelines for each stage enable risk management and adaptation planning to be progressed in accordance with best practice approaches nationally, and fit for purpose approaches for Victoria.

Progression between stages can be iterative, with feedback loops enabling review and refinement as the work progresses.

## Collaborative development

The statewide approach has been developed through a collaborative process to inform the program direction and design.

Many organisations provided time and expertise (Table 2), including through:

- **Development launch:** An online project introduction session in May 2021 with over 100 attendees from organisations across Victoria who manage and care for the coast.
- **DELWP Working Group:** A Department of Environment, Land, Water and Planning (DELWP) Working Group, with 30+ representatives from different sectors of DELWP. The DELWP Working Group met monthly over June 2021 to June 2022, alongside additional discussions.
- **Traditional Owner partnership:** A project partnership approach with Traditional Owners, including representatives from the six Registered Aboriginal Parties with Country across the Marine and Coastal Environment. The project partnership met fortnightly from August 2021 to June 2022, alongside individual discussions.
- **Collaborative Working Group:** A Collaborative Working Group with 40+ representatives from coastal Councils, Committees of Management, Catchment Management Authorities, government agencies, water authorities and peak body groups. The Collaborative Working Group met for a series of six workshops over July 2021 to March 2022, alongside individual discussions.

Our Victorian framework and guidelines have also been informed by:

- Leading research on climate adaptation
- National / international approaches (refer Attachment D)
- Victoria's place-based coastal hazard risk management and adaptation needs.

Victoria's Resilient Coast framework and guideline (this document) updates and builds from the previous Victorian Coastal Hazard Guideline (2012).

*Victoria's Resilient Coast – Adapting for 2100+ provides a statewide approach to coastal hazard risk management and adaptation*

**Table 2. Organisations contributing to the development of Victoria's Resilient Coast – Adapting for 2100+ framework and guidelines**

Sector	Organisation
Local Government	Borough of Queenscliff Casey City Council City of Port Phillip Colac Otway Shire Council East Gippsland Shire Council Glenelg Shire Council City of Greater Geelong Hobsons Bay Council Kingston City Council Mornington Peninsula Shire Council Moyne Shire Council South Gippsland Shire Council Warrnambool City Council Wellington Shire Council Wyndham City Council
Catchment Management Authorities & Melbourne Water	East Gippsland Catchment Management Authority Glenelg Hopkins Catchment Management Authority West Gippsland Catchment Management Authority Melbourne Water

Sector	Organisation
Registered Aboriginal Parties	Bunurong Land Council Aboriginal Corporation Eastern Maar Aboriginal Corporation Gunaikurnai Land and Waters Aboriginal Corporation Gunditj Mirring Traditional Owners Aboriginal Corporation Wadawurrung Traditional Owners Aboriginal Corporation Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation.
Victorian agencies and authorities	Barwon Water Parks Victoria Great Ocean Road Coast and Parks Authority Department of Environment, Land, Water and Planning Department of Transport.
Representative Bodies	Association of Bayside Municipalities Australian Coastal Society Boating Industry Association of Victoria Coastal, Ocean and Port Engineering Panel Life Saving Victoria Municipal Association of Victoria Port Phillip Bay Bathing Box Association Planning Institute of Australia Victorian Planning and Environmental Law Association.
Ports	Gippsland Ports Geelong Port Port of Portland Port of Melbourne.
Contributing authors	Water Technology (Stage 3) BMT (Stage 5) Alluvium and Natural Capital Economics (Stage 1 and 5) Blue Carbon Lab (Stage 5).

Sector	Organisation
DELWP sectors/teams	Biodiversity Futures Climate Change Policy Community and Partnerships (Barwon South West, Gippsland, and Port Phillip) Floodplain Management Integrated Catchment Management Inverloch Regional and Strategic Partnership Land and Built Environment (Barwon South West, Gippsland, and Port Phillip) Land Management Policy Marine Biodiversity Policy and Programs Marine Spatial Planning Planning Systems Reform Port Phillip Bay Coastal Hazard Assessment Statewide Coastal Programs Waterway Health Water Sector Climate Change Mitigation and Adaptation



Portsea

## Policy context

### Climate change adaptation

Climate change adaptation in Victoria is managed under the *Climate Change Act 2017* and *Climate Change Strategy 2021*<sup>3</sup>. These documents are supported by sector-based adaptation action plans and regional adaptation plans which will build the state's resilience and help Victorians plan for the impacts of climate change<sup>4</sup>.

Climate change adaptation across the marine and coastal environment is integrated across the different sector and regional adaptation action plans, with more specific adaptation needs

addressed through the *Marine and Coastal Act (2018)*, *Marine and Coastal Policy (2020)*<sup>5</sup>, and *Marine and Coastal Strategy (draft 2021)*<sup>6</sup>.

### Marine and coastal management

The *Marine and Coastal Act 2018* (the Act) is Victoria's overarching legislation to integrate and coordinate planning and management of the marine and coastal environment. Within the Act are several planning and management tools that range in application from state to site specific.

These tools support, and are supported by, land use policies and mechanisms under the *Planning and Environment Act 1987* (Figure 2).

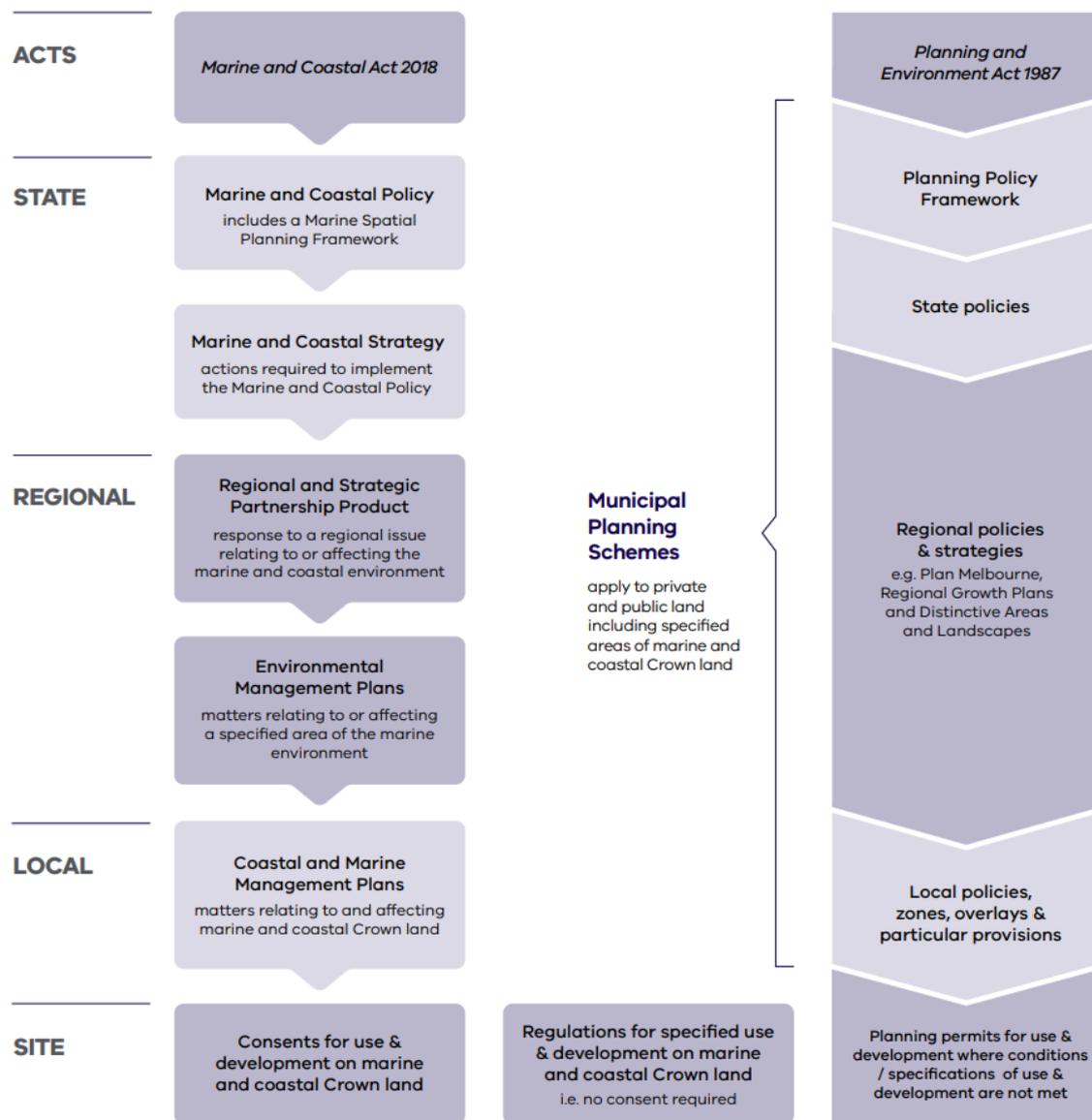


Figure 2. Key policy context for marine and coastal management

<sup>3</sup> [Victoria's Climate Change Strategy](#)

<sup>5</sup> [Marine and Coastal Policy \(marineandcoasts.vic.gov.au\)](#)

<sup>4</sup> [Building a climate-resilient Victoria | Engage Victoria](#)

<sup>6</sup> [Draft Marine and Coastal Strategy | Engage Victoria](#)

**Policy foundations**

The Marine and Coastal Policy (2020) sets out a 'Planning and Decision Pathway' (Figure 3) in accordance with the objectives and guiding principles of the Marine and Coastal Act (2018).

This Planning and Decision Pathway applies to all planning and decision making in the Marine and Coastal Environment (Figure 3), including consideration of coastal process, coastal hazard risk, and adaptation.

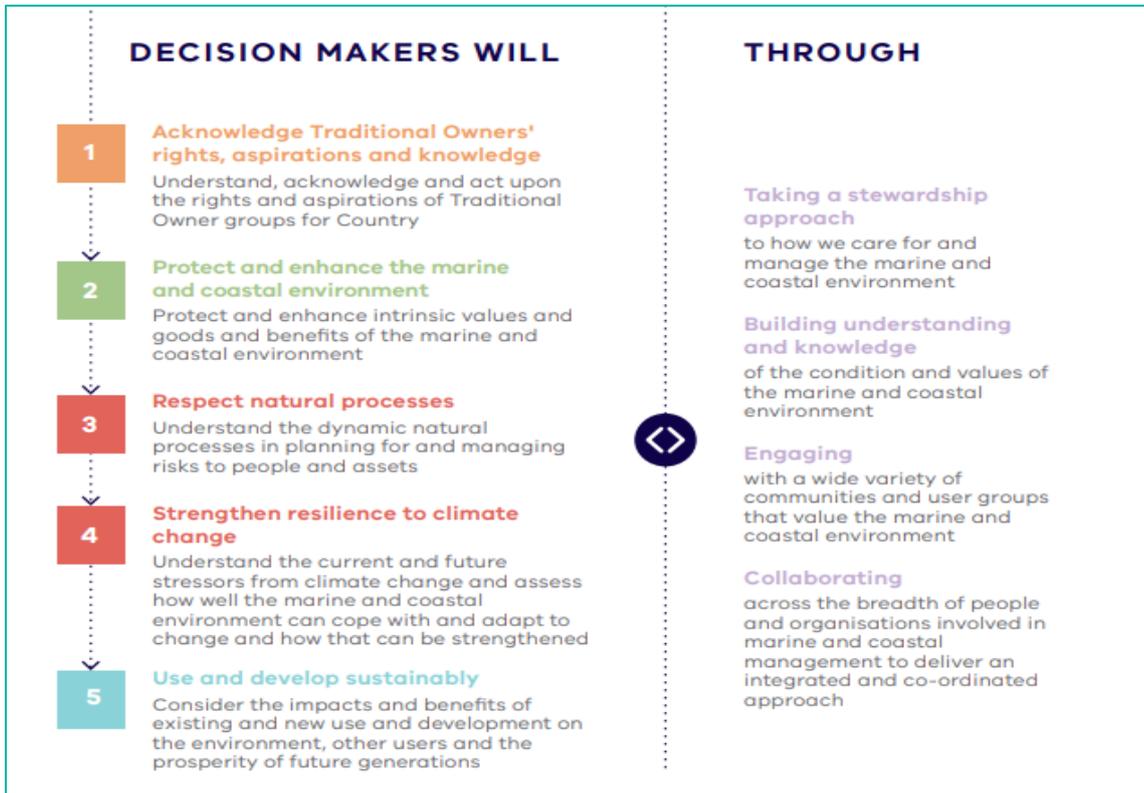


Figure 3. Marine and Coastal Policy (2020) Planning and Decision Pathway

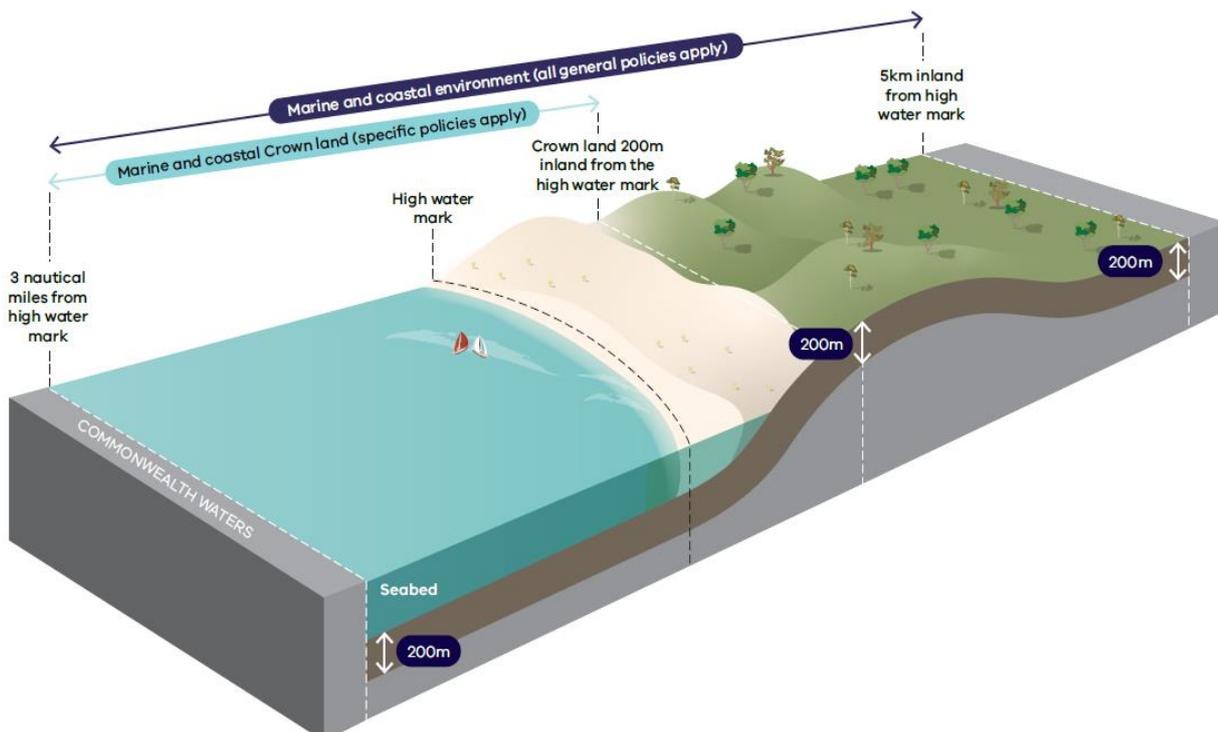


Figure 4. Areas where the Marine and Coastal Policy applies, including consideration of coastal processes and hazards

Policies and directions in relation to managing coastal hazard risk are outlined in Chapter 6 of the Marine and Coastal Policy (2020), including intended outcomes that:

- Coastal hazard risks and climate change impacts are understood and planned for
- Communities, land managers and decision makers have the capability and capacity to respond to coastal hazards
- The impacts of climate change on values of the marine and coastal environment are minimised
- Adaptation is embedded as a core component of planning in the marine and coastal environment and is used to manage uncertainty and build resilience.

*Victoria’s Resilient Coast – Adapting for 2100+* program builds on the Marine and Coastal Policy (2020) towards these intended outcomes.

### Coastal hazards

Natural physical, chemical, and biological process continually drive changes in our Victorian landscapes over short and long timeframes.

When these natural processes have a negative impact on landscape values and uses, we may refer to them as hazards.

Natural hazards can include a diversity of processes/events such as bushfire, extreme temperatures, invasive species, water quality changes, floods and drought.

The majority of natural hazards are not unique to the coast, and strategic management of those hazards is undertaken through a range of specific and integrated approaches at various local and regional scales.

‘Coastal hazards’ are a sub-set of physical and chemical natural hazards unique to the marine and coastal environment. Natural processes such as erosion and inundation continually shape our diverse and dynamic coastline. When these processes may have a negative impact on environmental, cultural, social and economic values along the coast, we refer to them as coastal hazards.

In Australia, coastal hazard definitions vary across the different States. Definitions for Victoria have been updated through the development of *Victoria’s Resilient Coast* guidelines, and build on

from the previous definitions in the Victorian Coastal Hazard Guide (2012).

Definitions developed for Victoria (Table 3) provide a baseline for coastal hazard types that should be considered in relation to coastal hazard risk management and adaptation.

Further detail on hazard definitions and mechanisms is provided in Stage 3 of the guidelines. Additional hazards may be of relevance in some areas, and should be included if/as required to address place-based adaptation needs.

Table 3. Coastal hazard definitions for Victoria

Category	Process/ hazard	Setting classes include
Erosion	<b>Short-term erosion:</b> Event-based erosion of sediment (storm-bite) and recovery	Sandy shorelines
	<b>Long-term erosion (recession):</b> Progressive retreat of shoreline position over time	Low-earth scarp
		Soft rock
		Hard rock
Accretion	Short or long-term build up of sediment in a localised area	All shoreline types
Inundation	<b>Storm tide inundation</b> Temporary event-based inundation	All low-lying coastal land
	<b>Permanent inundation</b> Regular or persistent inundation by the regular tidal cycle	All low-lying coastal land
Estuary dynamics	Changes in form and processes associated with estuarine and tidal areas	Estuary / tidal areas
Off-shore sediment dynamics	Changes in form and processes associated with offshore bathymetry and sediment transport	Up to 3 nautical miles offshore
Saline intrusion	Movement of saltwater into freshwater aquifers / groundwater	All low-lying coastal land



Kennett River

## Adaptation context

### Resilience, risk and adaptation

We can enhance our resilience to coastal hazards through a process of risk management and adaptation.

Our approach to managing coastal hazard risk in Victoria follows the directions of the Marine and Coastal Policy (2020). This includes to:

- Follow the overall 'Planning and Decision Pathway' of the policy (refer Figure 3)
- Respect natural coastal processes
- Strengthen resilience to climate change.

Stages 1 – 4 of *Victoria's Resilient Coast* framework and guidelines (Table 1) provides an approach to managing coastal hazard risk and progressing adaptation planning in accordance with these policy directions, including a values and place-based approach.

When considering adaptation options, including through Stages 5 – 6 of *Victoria's Resilient Coast* framework (Table 1), the Marine and Coastal Policy (2020) also requires land managers to:

- Consider strategic adaptation options in a certain order (Table 4)
- Apply an adaptation pathways approach.

#### Resilience is:

The capacity of social, economic, and environmental systems to cope with a hazardous event/trend, reorganising in ways that maintain their essential function, identity, and structure, while also maintaining capacity for adaptation, learning, and transformation.

#### Risk is:

The effect of uncertainty on objectives. In an operational context, risk is the likelihood of an event occurring, combined with its potential consequence.

#### Adaptation is:

The process of adjustment to actual or expected disturbance such as coastal hazards. In human systems, adaptation seeks to proactively manage / avoid harm, and make use of beneficial opportunities.



Barwon Heads

### Strategic order of consideration for options

There are a range of strategic options for coastal hazard risk management and adaptation. In Australia, the definitions of these strategic options are similar, but vary by State.

For Victoria, these definitions are defined in the Marine and Coastal Policy (2020) as (Table 4):

1. Non-intervention
2. Avoid
3. Nature-based methods
4. Accommodate
5. Retreat
6. Protect.

In practice, the hierarchy order must be considered and demonstrated when developing an approach for managing coastal hazard risk and developing an adaptation plan.

Further information on the range of adaptation actions that may be considered for each strategic adaptation option is provided in Stage 5 of the guidelines.

Adaptation actions are not mutually exclusive, and often a suite of measures is required to effectively manage coastal hazard risk, enabled through an adaptation pathways approach.

Table 4. Strategic adaptation option order of consideration

Strategic options order	Marine and Coastal Policy (2020) definitions	Planning considerations / types of actions
1. Non intervention	Allow marine and coastal processes, and the hazards they may pose, to occur.	Triggers (event, timing, other) can be identified for when additional action may commence.
2. Avoid	Locate new uses, development and redevelopment away from areas that are or will be negatively impacted by coastal hazards.	This option typically applies for all coastal hazard areas.
3. Nature-based methods	Enhancing or restoring natural features to mitigate coastal hazard risk.	This may include dune nourishment, wetland restoration, enabling landward migration of habitat, and potential hybrid nature based and engineering approaches (e.g. living shorelines).
4. Accommodate	Structures can be designed to reduce the exposure to, or decrease the impact of, coastal hazard risk, thus 'accommodating' the risk.	This may include movable infrastructure (e.g. life-saving towers, stairs/ramps) flood resilient building design, use of resilient materials.
5. Retreat	Existing structures, assets or uses may be decommissioned or relocated away from areas that are, or will be, negatively impacted by coastal hazards.	This may apply locally or more broadly as part of the adaptation planning process.
6. Protect (major engineering works)	Existing physical barriers are enhanced, or new ones constructed, to mitigate the impact of coastal hazards. Protect is an option of last resort; it is often expensive, its benefits tend to be very localised, and it frequently transfers the problem to nearby areas.	This may include seawalls or other physical barriers/structures or interventions (groynes, breakwaters) that are likely to have significant impact on natural coastal processes.

## Adaptation pathways

### Definitions

A pathways approach to planning is embedded into national best practice for coastal hazard risk management and adaptation.

A pathways approach enables a range of actions to be identified, and their relative sequence, timing, and triggers for implementation from present day to longer-term (2100), to reduce coastal hazard risk in different place-based contexts (Figure 5).

The feasibility of actions may change over time, as conditions change, and adaptation pathways are regularly reviewed.

### Marine and Coastal Policy (2020)

#### A pathways approach:

- Is a decision making process
- Is made up of a sequence of steps or decision points over time
- Uses thresholds and triggers for when new decisions need to be made
- Is forward looking
- Recognises the changing nature of climate change impacts
- Aims to ensure the most effective tools are being used at the most effective time.

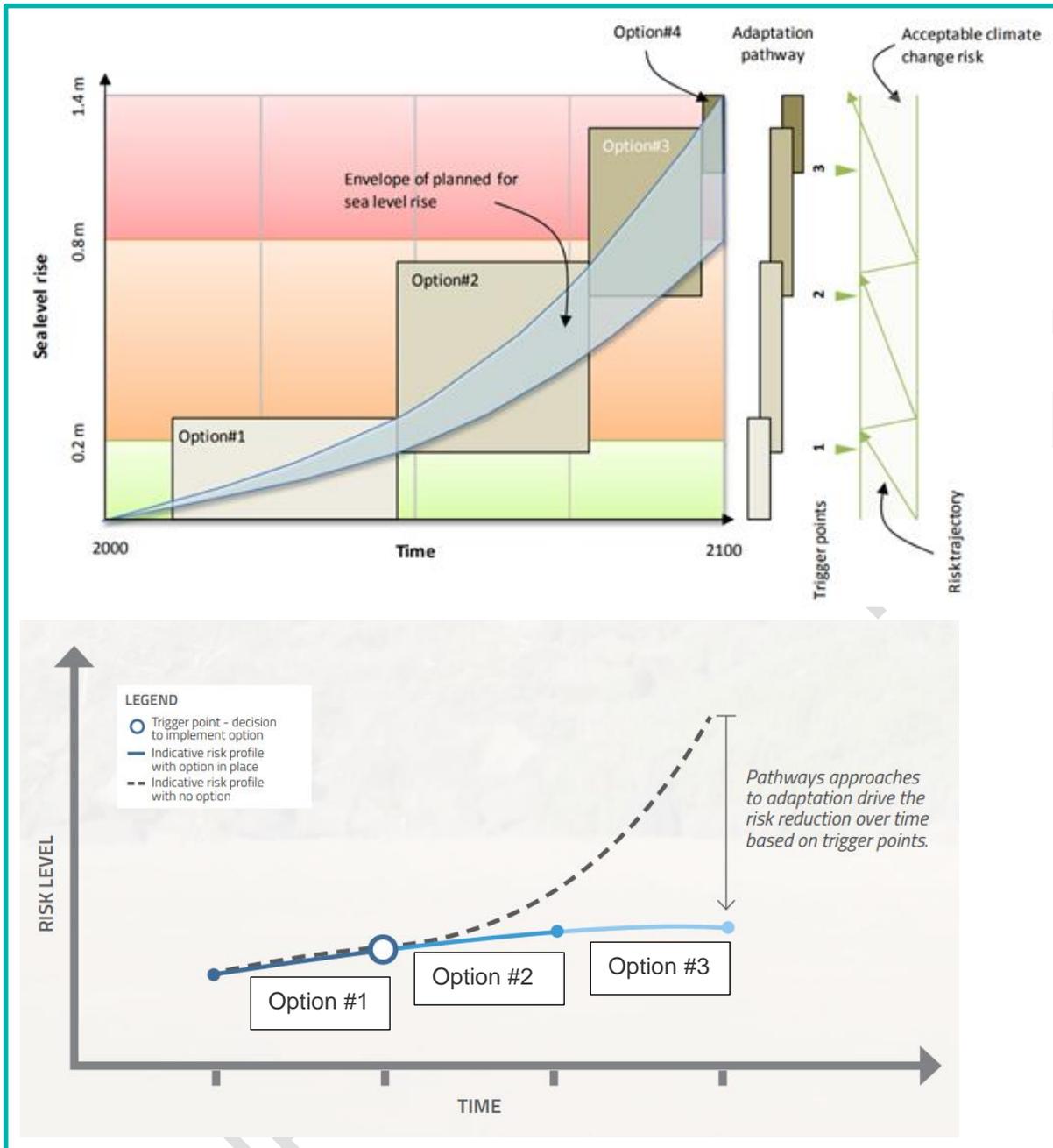


Figure 5. Example theory for adaptation pathways approach – a pathway of options and triggers for change, implemented over time to reduce risk level<sup>7</sup>

<sup>7</sup> (a) GORCC, 2012, “Sequence of sea level rise adaptation options over time included in a pathways approach”; and (b) Adapted from, Bundaberg Regional Council, 2020, “Bundaberg Coastal Hazard Adaptation Strategy”.

Pathways in practice

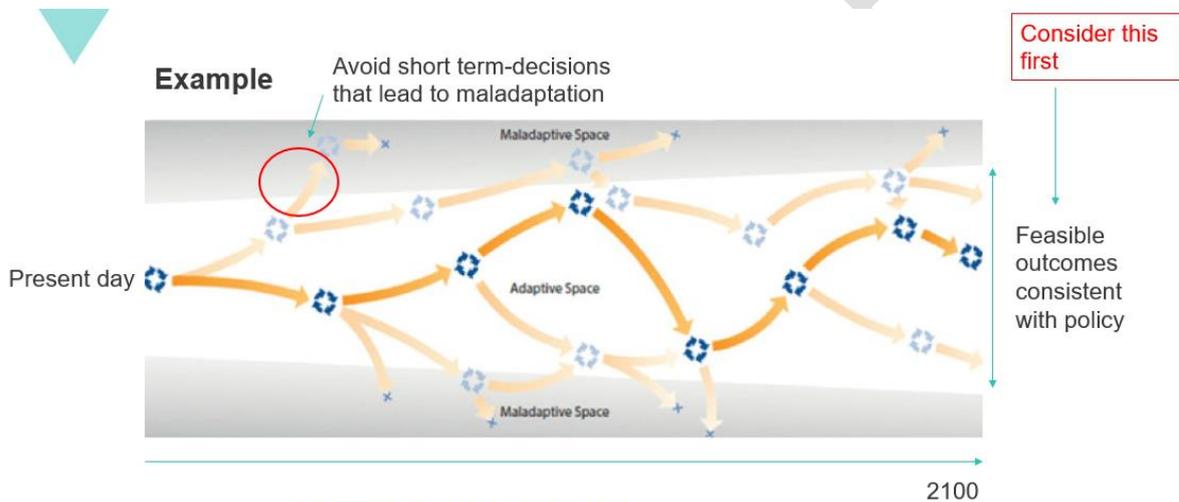
In practice, a pathways approach provides a 'road map' for adaptation from present day to a long-term planning horizon (typically 2100). Using this approach enables (Figure 6<sup>8</sup>):

- Long-term strategic planning
- Consideration of multiple potential futures and associated adaptation pathways, and preferred pathways consistent with Marine and Coastal Policy (2020) directions
- Avoidance of short term actions that may lead to maladaptation
- Confidence to take short term action.

A pathways approach is typically represented in a table or diagram that details the range of adaptation actions to be taken over time, along a preferred adaptation pathway, trigger/decision points for change and alternative pathways.

Adaptation actions can include planning and design, nature-based, engineering and other actions, as further outlined in Stage 5 of the guidelines and the associated 'Adaptation Actions Compendium' (Attachment B).

Further guidance on developing adaptation pathways is provided in Stage 5 of the guidelines.



Sources: CoastAdapt - [What is a pathways approach to adaptation?](#) | CoastAdapt  
 Reisinger in Wise et. al 2014 (above) and Rosenzweig and Solecki 2014, adapted from City of London, "The Thames Estuary 2100 Plan," April 2009 (below).

Policy order of consideration	Present day	SLR 0.5m 2070	SLR 0.8m 2100
1. Non-intervention	Natural dune system dynamics		
2. Avoid		Avoid new non-relocatable assets in hazard areas	
3. Nature-based methods*	Consider feasibility of nature based methods	Dune enhancement program + monitoring and evaluation	Triggers: • Infrastructure renewal • Nature-based becomes infeasible • Erosion distance/rate • Other
4. Accommodate-style methods	Floor level, materials, storage areas		
5. Retreat	Preparation for retreat: • Engagement process • Land tenure • Cost/budget • Planning mechanisms	Relocate infrastructure Transition to alternative land uses	
6. Protect			Protection works (if appropriate) and ongoing maintenance

\*Nature-based methods use the creation or restoration of coastal habitats for hazard risk reduction (Morris RL, et al. 2021).

Figure 6. Example adaptation pathway theory and in practice

<sup>8</sup> What is a pathways approach to adaptation? | CoastAdapt

**How we can adapt**

There are a range of ways we adapt to change, including a spectrum of coping, incremental adaptation, through to transformational adaptation (Table 5).

Through the relevant Stages (1 – 6) of Victoria’s Resilient Coast framework, the appreciation of values and vision, vulnerability and risk, and adaptation options in each place based context should inform consideration of where the opportunities may be for transformational adaptation.

In contrast to coping or incremental adaptation, transformational adaptation aims to reduce the root causes of vulnerability. Transformational adaptation is desirable in systems where tipping points may be reached. Common examples of transformation adaptation include retreat pathways that involve relocating infrastructure and transitioning to alternative land use in coastal hazard zones.



Hobsons Bay

**Enabling best practice**

Enabling best practice adaptation requires a long-term approach, thinking towards 2100 and beyond. National approaches vary on the planning horizons and hazard scenarios included, and this also needs to be nuanced by place-based setting needs.

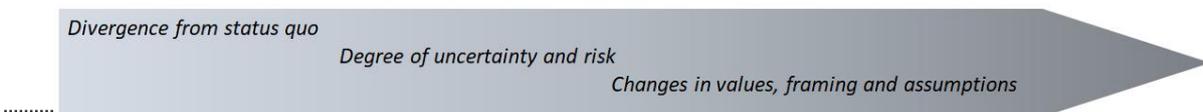
To enable the core elements of a best practice approach, key needs for strategic adaptation planning include the following:

- **A suite of planning horizons from present day to 2100:** Include a minimum suite of three planning horizons spanning present day, 2100 and an interim horizon. Align interim planning horizons with relevant place-based strategic planning contexts and available information (e.g. timing for planning scheme updates, other strategic plan updates, available scientific data).
- **A suite of hazard event likelihoods:** Include a minimum of three coastal hazard event likelihoods for the relevant technical assessments to enable best practice and probabilistic approaches to risk and economic assessments. This includes smaller events (e.g. 10%AEP), a 1%AEP, and larger events (e.g. 0.2% AEP).

Further guidance on best practice, planning horizons and scenarios is provided in Stage 3.

**Table 5. Types of adaptation<sup>9</sup>**

COPING	INCREMENTAL ADAPTATION	TRANSFORMATIONAL ADAPTATION
Following impact, re-establishing and restoring systems and assets back to a <u>similar state</u>	Prior to, or following impact, adjusting, reducing vulnerability, or building resilience, to <u>maintain the essence or integrity</u> of a system or process	Prior to, or following impact, changing the fundamental attributes of a system to reduce the <u>root causes</u> of vulnerability and <u>shift systems</u> away from unsustainable or undesirable trajectories
<i>Rebuild damaged built infrastructure after a major storm event</i>	<i>Rebuild damaged built infrastructure to stricter standards following a major storm event</i>	<i>Relocate built infrastructure to locations with lower risk of major storm events</i>
<i>Replant crops affected by saltwater intrusion</i>	<i>Change to more salt tolerant crops in areas affected by saltwater intrusion</i>	<i>Transition affected agricultural land to native coastal vegetation types (e.g. mangrove, saltmarsh) and associated ecosystem services</i>



<sup>9</sup> Adapted from Fedele et al/2019 and Noble et al/2014

## Where these guidelines apply

### All coastal hazard risk management and adaptation

The primary purpose of these guidelines is to provide a best practice and consistent approach to the strategic management of coastal hazard risk, and to support the progression of coastal adaptation in Victoria.

The guidance is relevant for:

- Public and private land
- All areas within the Marine and Coastal Environment as defined by the Marine and Coastal Act (2018) which includes up to 5 km inland from the high tide mark, and up to 3 nautical miles offshore (refer Figure 4).

The guidelines can be applied for:

1. Managing coastal hazard risk and adaptation planning in all contexts (site/issue based, local, regional), through following the principles of the framework stages and guidelines.
2. Progressing local/regional scale adaptation planning through completion of one or more of the seven stages of the framework.
3. Developing a regional Coastal Hazard Adaptation and Resilience Plan (CHARP) (refer Figure 2) through completing the full seven stage framework.

### Developing a regional CHARP

The spatial extent of a Coastal Hazard Adaptation and Resilience Plan (CHARP) (or similar) at a regional scale will be tailored to the relevant place based context, and encompass relevant sediment compartments and jurisdictional areas. Further guidance on scoping a suitable spatial scale is provided in Stage 1.

The spatial extent of a CHARP is also likely to include one or more Crown land foreshore areas with multiple Coastal and Marine Management Plans (CMMPs) in place.

The work completed for CMMPs and other existing plans/strategies in a study area (e.g. Country Plans, National Park Plans, Municipal Planning Schemes, Marine Spatial Planning) will be incorporated into Stage 2 (values, vision and objectives) of the CHARP (refer Stage 2 for further guidance), and inform other Stages as relevant.

## How to use these guidelines

### General

These guidelines can be used to:

- **Review:**  
Provide guidance for reviewing coastal hazard risk management and adaptation planning work completed to date in a local/regional area. Existing work can be aligned to the framework stages, and gaps / needs identified.
- **Scope:**  
Assist with scoping a program of work to progress risk management and adaptation. A tailored scope of work can be developed for each Stage.
- **Progress and endorse:**  
Assist with progressing and implementing risk management and adaptation planning in line with best practice for technical, engagement and strategic elements of the statewide approach.

The guidelines assist the program of work to be completed and endorsed by project partners for each Stage.

The following sections of the guidelines summarise the process and guidance for each of the seven Stages of Victoria's Resilient Coast framework. Additional supporting resources are provided in Attachments A – E.

### Summary reports

The output of each framework stage includes a summary report.

Summary reports are intended to provide a concise summary of the technical, engagement and strategic work completed for each stage, suitable for sharing with project partners for endorsement and to confirm next steps before the work progresses.

The length and detail may vary from a short memo for smaller local projects, to a more detailed technical report for regional scale projects.

The summary reports represent key HOLD POINTS in the strategic risk management and adaptation planning process. This assists with:

- Ensuring that the scope of work in each Stage has covered all necessary elements
- Confirming with project partners the scope of the following stages
- Ensuring a collaborative process is underpinning decision making.

### Checklist

A checklist is provided at the end of each of Stages 2 - 7 to:

- Enable review of the core elements
- Confirm support from project partners
- Identify any gaps or elements that need to be revisited before progressing
- Endorse that the work completed is fit for purpose and ready to progress.

Project managers may wish to review and tailor checklists to the needs of each project and the project partners.

### Need further support and advice?

The DELWP team can provide additional guidance and support for scoping coastal hazard risk management and adaptation planning projects.

Please contact your local DELWP region team to discuss your initial ideas and opportunities in your area.

# Stage 1 - Scoping and preparation

Stage		Across all
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	Collaborative process
Stage 4	Vulnerability and risk	
Stage 5	Adaptation actions and pathways	Engagement and communication
Stage 6	Plan and implement	
Stage 7	Ongoing monitoring and review	

## 1.1 Define the need for action

Different parts of Victoria’s marine and coastal environment will have different coastal hazard adaptation needs.

In seeking to progress coastal hazard risk management and adaptation planning, lead/partner organisations should first articulate the need for action.

Defining the need for action across an area of interest assists with:

- Generating internal and external support
- Clarifying unique place-based needs and objectives for adaptation
- Defining a suitable study area and governance model / collaborative process.

For example, the need for action may reference existing knowledge on:

- Current hazard exposure, including the relevant types of hazards, past/recent events impacting on coastal values and use
- Immediate hazard risks (where known)
- Future hazard exposure (where known)
- Known sensitive coastal values including cultural, environmental values that may be at risk
- Expenditure on coastal hazard impacts to date
- Organisational priorities to invest / act on climate change
- Opportunities to align with priorities for multiple organisation / partners.

This section provides an overview of:

- Stage purpose
- Define the need for action
- Refine the study area
- Select a governance model
- Establish a collaborative process
- Scope the work required
- Complete a Project Plan
- Stage 1 checklist.

### Stage purpose

The purpose of Stage 1 is to provide a foundation for commencing or progressing coastal hazard risk management and adaptation planning, aligned to best practice guidance, in each place based context.



Anglesea

The need for action is often best framed as the positive outcomes associated with pro-active risk management and adaptation planning.

This may include:

- A need / opportunities to avoid or mitigate adverse impacts on cultural, environmental, social and economic values of the coast
- Pro-active action on potential climate change impacts.

## 1.2 Refine the study area

The study area for managing coastal hazard risk and progressing adaptation planning will vary based on each place-based context.

The definition of the study area should consider:

- The landscape setting, including sediment compartments
- Jurisdictional areas and boundaries
- Existing plans and strategies, including Coastal and Marine Management Plans (CMMPs)
- Public and private land across the Marine and Coastal Environment.

Lead/partner agencies can scope an appropriate study area that best meets the needs for each place-based context. Further guiding questions to assist with defining a study area are provided in Table 6.

**Table 6. Guiding questions for defining a study area**

Category	Example questions	Considerations
Landscape setting	What are the primary, secondary and coastal compartments in this region? (refer to Stage 3 for further detail)	Aligning study area to landscape processes and hazard assessment extents (Stage 3)
	Where do we already have detailed coastal hazard information?	The cost/logistics of acquiring new coastal hazard information
Jurisdictional areas	What jurisdictional areas should the study be inclusive of?	Aligning study area to be: <ul style="list-style-type: none"> <li>- Inclusive of key partner areas including Local Government Areas, Registered Aboriginal Parties, Catchment Management Authorities, National Park areas, other.</li> <li>- The best use of resources.</li> </ul>
Existing knowledge, plans and strategies	Where are the known risks and vulnerabilities from coastal hazards currently and or projected to be?	Aligning study area with the greatest need for action
	Where are there known management gaps?	
	What current plans and strategies exist (including CMMPs)?	Aligning study area to best incorporate and build on from (and not duplicate) existing work
Public and private land	What extent of public and private land is likely to be within the 2100 hazard extents?	Ensuring study area is inclusive of all relevant areas for long-term planning (2100+).

Refinement to the study area may also occur during iterative review of subsequent Stages 2 to 5, as more detailed assessments of values, physical process and hazards, vulnerability and risk are undertaken, and the collaborative engagement process progresses.

Where it is feasible to do so, strategic coastal hazard risk management and adaptation planning is best framed across study areas at a regional scale – e.g. whole or multiple LGAs, whole / multiple secondary sediment compartments.

Finer scale site/issue based risk management and adaptation planning should also consider and adopt relevant information from the broader regional context.

**Resources - Coastkit**

DELWP's Coastkit portal provides a range of up to date information on marine and coastal scientific data, images and resources including:

- Existing coastal hazard information
- Physical conditions / data for the coast
- Jurisdictional and administrative areas
- Statewide / first pass studies
- Easy to navigate mapping products (aerial imagery, location details).



<https://www.marineandcoasts.vic.gov.au/coastal-programs/coastkit>

**1.3 Select a governance model**

**Models**

The progression of coastal hazard risk management and adaptation planning for Victoria is supported through a flexible range of governance models (Table 7).

Different governance models will be fit-for-purpose in different contexts.

Lead/partner organisations can select a governance model that best meets the needs of the defined study area.

The seven stages of *Victoria's Resilient Coast* framework and guidelines apply to progressing coastal hazard risk management and adaptation planning under all governance models, founded on a collaborative approach in each case (as outlined in Section 1.4).

For progressing regional scale planning, lead/partner organisations may consider the relative benefits/challenges of a statutory RaSP or non-statutory partnership model for their own place-based context.

**Table 7. Governance models for progressing adaptation planning**

Model	Context	Considerations
Regional and Strategic Partnership (RaSP)	Statutory strategic planning process under the Marine and Coastal Act, refer Figure 2.	Land manager / Local Government lead with State partnership.  State lead also feasible.
Other partnership models for regional scale adaptation	Non-statutory strategic planning process.	
Individual organisations – site/issue based adaptation	Non-statutory strategic and operational planning.	Land managers with State support.

Key considerations may include:

- Model establishment time/preparation
- Lead agency / partner agency needs, capacity, skills
- Existing collaborative arrangements
- Implementation needs – is statutory backing required for accountability / enforceability, or is a non-statutory approach appropriate
- Complexity / scale of program.

**Roles**

For regional partnership approaches, lead/partner organisations will need to confirm the proposed governance model, and gather endorsement from all project partners.

Formalised governance arrangements can be provided through:

- The establishment of a Regional and Strategic Partnership under the Marine and Coastal Act (2018)
- A non-statutory Memorandum of Understanding (MoU) between the project partners

In all cases, a Terms of Reference for ‘the partnership’ is required, articulating project lead and partner roles, contributions and expectations.

Where a partnership will be seeking State funding support, the partnership must nominate a lead organisation to receive the funds and administer the project.

DELWP representatives from relevant regions and policy teams must form part of the governance arrangements for endorsement of each stage.



Kennett River

**Partnering with Traditional Owners**

Australia is a signatory to the United Nations Declaration on the Rights of Indigenous Peoples (UN Declaration). The UN Declaration outlines the rights of Indigenous peoples around the world and describes self-determination as the right of Indigenous peoples to ‘freely determine their political status and pursue their economic, social and cultural development’.

Agencies and departments must work in partnership with Traditional Owners and Aboriginal Victorians to support their right to self-determination.

The *Aboriginal Heritage Act 2006* recognises Registered Aboriginal Parties (RAP) as the primary guardians, keepers and knowledge holders of Aboriginal Cultural Heritage. RAP groups must be engaged, using a self-determination model, in coastal hazard risk management and adaptation planning.

**In the context of all governance models for coastal hazard risk management and adaptation, the following principles apply:**

- Enable a partnership approach with Traditional Owner groups in the region
- Engage early (Stage 1 scoping) to enable self-determination and inform funding needs for a partnership approach and project scope
- Enable self-determination of coastal hazard risk management and adaptation needs and interests
- Enable polices 1.1 to 1.9 of the Marine and Coastal Policy (2020) and actions in the Marine and Coastal Strategy.

Registered Aboriginal Parties across the marine and coastal environment (February 2022):

• Bunurong Land Council Aboriginal Corporation
• Eastern Maar Aboriginal Corporation
• Gunaikurnai Land and Waters Aboriginal Corporation
• Gunditj Mirring Traditional Owners Aboriginal Corporation
• Wadawurrung Traditional Owners Aboriginal Corporation
• Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation.

### Skills/capacity

In considering project roles and establishing a Terms of Reference, the range of skills/capacity required for regional scale adaptation planning should be considered. This includes skills in (and is not limited to):

- Large/complex project management
- Leading a collaborative process
- Engagement and communication
- Coastal hazard adaptation strategic planning
- Policy and statutory planning
- Coastal science and engineering
- Cultural heritage
- Environmental management
- Infrastructure management
- Economic assessments.

Project partners may contribute technical expertise, project funding or in-kind support, provide linkages to communities, and implement actions.

Additional technical expertise / support may be procured to assist with various technical, strategic and engagement elements of the framework.

### Project partners

The range of project partners that should be considered in regional partnership models (statutory or non-statutory) include:

- Registered Aboriginal Parties
- DELWP
- Local Government
- Committees of Management
- Catchment Management Authorities
- Other State Government agencies
- Water authorities
- Major infrastructure managers / providers
- Port managers
- Representative and peak body groups
- Community groups.

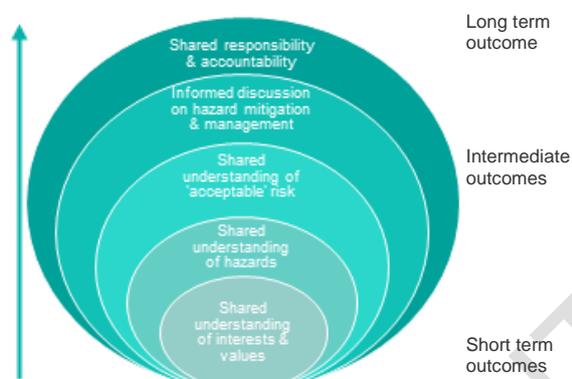
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## 1.4 Establish a collaborative process

### A tailored approach

The planning and management of coastal hazards is ultimately the shared responsibility of a large number of rightsholders and stakeholders, including Traditional Owners, land managers, state and local government agencies, land and asset owners, and the broader community.

To achieve and sustain the desired long-term outcome of shared responsibility and accountability, a collaborative engagement process can be tailored to support adaptation planning (refer Figure 1).



**Figure 1. Desired engagement outcomes that support progression of adaptation**

As part of Stage 1 scoping, a tailored engagement and communication approach is developed. This includes consideration for each framework Stage of:

- **The engagement process** – activities and outcomes
- **Communication** - key messaging and tools
- **Tailored needs** for different audiences including executive, within lead organisations, project partners, community.

The approach to Engagement and Communication is fundamental to the successful progression of coastal hazard adaptation planning and action.

The development of the engagement and communication approach should be undertaken/supported by organisations with

specialist engagement expertise in adaptation planning contexts.

Important components of establishing a collaborative process include:

- Rightsholder/stakeholder mapping
- Aligning activities to the desired outcomes at all relevant framework stages
- Tailoring activities and approaches to relevant audiences and with consideration of the IAP2 spectrum (Figure 7) [iap2.org.au/resources/spectrum/](http://iap2.org.au/resources/spectrum/)
- Aligning with principles of the DELWP engagement framework
- A focus on two-way flow of information
- Clarity on negotiables / non-negotiables
- Key messaging for each Stage
- Developing an Engagement and Communication Plan with details for each Stage of the framework
- Keeping the Engagement and Communication Plan and approach live and regularly review as work progresses.

### Engagement and Communication Plan

To assist with shaping an Engagement and Communication Plan, a three phase process based on DELWP best practice includes to:

- **UNDERSTAND** why you are engaging, who you should include in the process, the potential risks involved and the resources available to engage
- **IMPLEMENT** the engagement process by choosing the right techniques, having a robust plan, a clear engagement message and by documenting and sharing the findings
- **EVALUATE** and reflect on engagement process and outcomes to learn, improve and share.

Further guidance on these elements is outlined in Attachment E.

Figure 7. After the International Association of Public Participation's Public Participation Spectrum



Table 8. Additional tools and resources

**Additional tools**

- Online workshoping canvases and whiteboards:
  - Mural™ - <https://www.mural.co/>
  - Google Jamboard™ - <https://jamboard.google.com/>
  - Miro™ - <https://miro.com/>
  - Several others available as well.
- Hemingway Editor makes suggestions to improve clarity of written text. It also provides a readability grade (e.g. Grade 10 is readable by an average Grade 10 student) - <https://hemingwayapp.com/>
- Test the readability of your messages using <https://readabilityformulas.com/free-readability-formula-tests.php>

**Additional resources**

[engage.vic.gov.au/draft-public-engagement-framework](https://engage.vic.gov.au/draft-public-engagement-framework)

[www.vic.gov.au/stakeholder-engagement](https://www.vic.gov.au/stakeholder-engagement)

[www.vic.gov.au/introduction-human-centred-design](https://www.vic.gov.au/introduction-human-centred-design)

[www.mdba.gov.au/sites/default/files/archived/mbdc-S-E-reports/1831\\_towards\\_whole\\_of\\_community\\_engagement\\_toolkit.pdf](https://www.mdba.gov.au/sites/default/files/archived/mbdc-S-E-reports/1831_towards_whole_of_community_engagement_toolkit.pdf)

[www.bi.team/publications/east-four-simple-ways-to-apply-behavioural-insights/](https://www.bi.team/publications/east-four-simple-ways-to-apply-behavioural-insights/)

[www.bi.team/our-work/tools/](https://www.bi.team/our-work/tools/)

[www.psychologytoday.com/au/blog/some-assembly-required/201702/the-4-primary-principles-communication-behaviouraleconomics.pmc.gov.au/learn-hub](https://www.psychologytoday.com/au/blog/some-assembly-required/201702/the-4-primary-principles-communication-behaviouraleconomics.pmc.gov.au/learn-hub)

[campaigns.sustainability.vic.gov.au/asset-library/community-climate-change-and-energy-action-program/communications-toolkit](https://campaigns.sustainability.vic.gov.au/asset-library/community-climate-change-and-energy-action-program/communications-toolkit)

[climatevisuals.org/evidence/](https://climatevisuals.org/evidence/)

**Engagement and communication reference pack – example activities**



A communications and engagement 'Reference Pack' was developed as a resource to support and empower the Port Phillip Bay Coastal Hazard Assessment (PPBCHA) project Delivery Partners in delivering successful coastal hazard engagement programs within their communities.

The Reference Pack includes a series of factsheets about nine different engagement and communication activities / tools. These tools are:

- Wave tanks
- Coastal timelines
- Community pop-ups
- Community workshops
- Interviews
- Communications toolkit
- Internal/intra-agency engagement
- Stakeholder briefings
- Interagency engagement.

### 1.5 Scope the work required

Coastal hazard risk management and adaptation planning will be at different stages along the Victorian coastline.

The primary purpose of this step is to define the scope of the adaptation planning to be undertaken. By undertaking a scoping study, a solid foundation and framework for future phases will be set. A well-developed study should also assist in gaining buy-in from the project partnership organisations, including internal senior officers and executive.

*Victoria's Resilient Coast* seven stage framework enables project leads / partners to progress adaptation planning from any stage of the process.

In scoping adaptation needs, land managers should consider:

- How does work complete to date align to the seven stage framework?
- Are some stages fully complete?
- Which stages are not yet commenced?
- Are some stages partially complete – and what gaps need to be filled?
- Does existing work from some stages need updating?
- What are the tailored needs of the project partners?
- What is needed to ensure a collaborative approach is continued / enhanced for future work?

Pending the skills and capacity of lead organisations, expert advice in scoping adaptation projects may be of benefit in identifying the work required to progress / complete each of Stages 2 – 7.

Scoping of the work should include consideration for all coastal hazard adaptation needs and opportunities for the study area, including environmental and cultural considerations.

The proposed scope of work for each stage of the framework should include the technical, strategic and engagement studies and activities required to align with best practice guidance and advance adaptation planning for the region.

The scope for each framework stage should include options, hold points and flexibility to be

delivered in an iterative way. The scope should be confirmed and refined with project partners at each Stage, as the work progresses and new information is delivered.

### 1.6 Complete a Project Plan

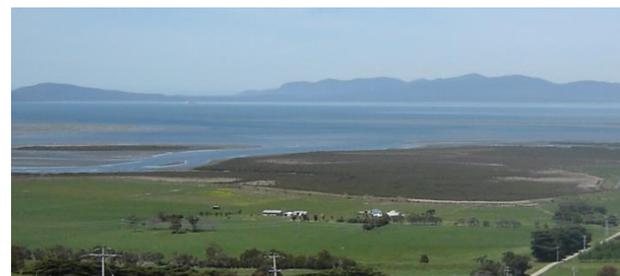
The output of Stage 1 scoping is a Project Plan that is supported by all project partners.

At a minimum this Project Plan must summarise:

- The need for action – refined through the collaborative work of the scoping stage
- The study area
- The governance model
- The proposed collaborative process for the project, detailed in a Communication and Engagement Plan
- The scope the work required for each Stage
- Supporting documentation (e.g. RaSP or MoU arrangements, funding agreements, other).

### Stage 1 checklist

Readiness to progress checklist	
Have you reviewed Stages 2 - 7 of the guidelines to inform the scope of the work required?	
Have you completed a Project Plan that includes a summary of the required Stage 1 scoping elements (1.1. to 1.5)?	
Does the Project Plan have in principle support from all project partners?	
Has DELWP provided in principle support for the Project Plan?	
Are all necessary agreements and resources in place for the scope of the work?	



Corner Inlet

## Stage 2 – Values, vision and objectives

Stage		Across all
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	Collaborative process
Stage 4	Vulnerability and risk	
Stage 5	Adaptation actions and pathways	Engagement and communication
Stage 6	Plan and implement	
Stage 7	Ongoing monitoring and review	

This section provides an overview of:

- Stage purpose
- Engagement and communication
- Identify aspirations & values
- Develop a shared vision and objectives
- Stage 2 summary report
- Stage 2 checklist.

### Stage purpose

The purpose of this stage is to provide a foundation for coastal hazard risk management and adaptation planning that is based on regional and place-based values.

Community aspirations, values and vision for place based areas, combined with our Marine and Coastal Policy (2020) vision for the Victorian coast as a whole, underpin assessments in later stages of the framework, including coastal hazard vulnerability and risk, and evaluation of adaptation options.

### Engagement & communication

A tailored engagement and communication process should underpin Stage 2 as per the approach to creating a collaborative process (Stage 1.4) and activities detailed in the Project Plan.

Activities should include participatory approaches to enable a two-way flow of information. For Stage 2 this may include:

- Site visits, workshops, meetings, and online sessions, surveys - to support identifying community aspirations, values and shared visioning
- Ongoing partnership discussions with Traditional Owners, including consideration of cultural values
- Website/engagement platform and materials set up
- Tailoring of key messaging for Stage 2 and for different audiences – e.g. to introduce the project, key terminology, scope of work, opportunities to engage, values and vision context, seek input and communicate outcomes. Example key messages are provided in Attachment F.

## 2.1 Identify aspirations and values

### Our Victorian context

Our Victorian marine and coastal environment supports a diversity of values and uses.

Traditional Owners continue to nurture, heal and restore cultural landscapes across Country.

The Victorian Marine and Coastal Policy (2020) articulates the shared community aspirations for our marine and coastal environments. These aspirations are embedded in the policy vision, and the elements of the vision look like in practice.

The policy provides the foundation for decision making to ensure planning and management actions align to the shared vision for the whole Victorian coast.

#### Marine and Coastal Policy (2020)

*Our vision is for a healthy, dynamic and biodiverse marine and coastal environment that is valued in its own right, and that benefits the Victorian community, now and in the future.*

[Marine and Coastal Policy](http://marineandcoasts.vic.gov.au)  
([marineandcoasts.vic.gov.au](http://marineandcoasts.vic.gov.au))



Brighton

### Role of local aspirations and values +

In addition to our Victorian vision and policies, identifying local aspirations and values is critical for strategic coastal hazard risk management and adaptation.

In practice, identifying local aspirations and values:

- Supports a collaborative approach to risk and adaptation
- Directly informs the scope of work in Stages 3 – 5 of *Victoria's Resilient Coast framework*.

Aspirations and values inform the scope of work through:

- Stage 3: Ensuring that the scope of the technical hazard assessments/data is suitable for addressing the potential impacts for key values and uses
- Stage 4: Ensuring that the relevant data is sourced, and that the scope of vulnerability and risk assessments addresses place-based values
- Stage 4: Informing best practice risk (likelihood x consequence) assessments that embed local values into the assessment of consequence of coastal hazard impacts
- Stage 5: Informing the approach to the evaluation of adaptation options including tailored multi-criteria and cost-benefit analysis
- Stage 5 & 6: Informing appreciation of local values in the context of regional values, to better inform shared understanding and decision making on risk management and adaptation actions, implications and priorities.

Local values include consideration of broader regional areas (e.g. broader coastal compartments, cultural landscapes, LGAs) to ensure an appreciation of the tailored landscape setting within which local foreshore areas / beaches / townships are situated.

## Identifying aspirations and values

Identifying local community aspirations and values should include:

- A review of existing plans, strategies, including Country Plans, Coastal and Marine Management Plans (CMMPs), Municipal Planning Schemes and other relevant place-based strategies that articulate aspirations and values for marine and coastal environments.

This is inclusive of:

- All coastal areas
- Coastal waterways and estuaries
- Climate change planning contexts.
- Partnership discussions with Traditional Owner groups
- Tailored engagement and communication activities to gather updated information on community aspirations and values.
- Documenting the diversity of environmental, cultural, social and economic values and uses.

Identifying local values should incorporate and build on values identified in existing CMMPs. Additional detailed guidance and sources for identifying values are provided in the CMMP guidelines<sup>10</sup>.

### Crown land / foreshore areas

Coastal and Marine Management Plans (CMMPs) are a tool under the *Marine and Coastal Act 2018* that establishes an agreement between the Victorian Government, land managers, and the community as to how an area of coastal Crown land in Victoria will be managed.

A CMMP is a tool to assist Crown land managers and the community to care for special coastal and marine environments and manage demand and conflicting uses now and in the future.

CMMPs provide a 5 year plan for management that considers all values, threats and priority management needs for our marine and coastal Crown land.

<https://www.marineandcoasts.vic.gov.au/coastal-management/coastal-management-plans>

### Climate adaptation contexts

Guided by the Climate Change Strategy, the Victorian Government is planning for climate impacts and delivering adaptation action at different scales across the state.

At a state scale we are preparing Adaptation Action Plans to build our climate resilience in areas either vulnerable to climate change impacts or essential to ensure Victoria is prepared. These areas or 'systems' are Primary Production, Built Environment, Education and Training, Health and Human Services, Transport, Natural Environment and the Water Cycle.

At a regional scale we are supporting the development of Regional Adaptation Strategies in partnership with regional stakeholders and communities to identify, prioritise and deliver place-based climate change adaptation action informed by local knowledge and needs.

Coastal adaptation and resilience planning cuts across all seven sectors, and all regional areas along the coast.

<https://www.climatechange.vic.gov.au/>

<sup>10</sup> Currently draft out for targeted consultation, link to be added when complete.

**Waterways and estuaries**

The *Victorian Waterway Management Strategy* provides a detailed policy for managing Victoria's waterways over an eight-year period. The Strategy aims to maintain or improve the condition of our waterways so they can support environmental, social, cultural and economic values that are important to communities.

Regional Waterway Strategies (RWS) are a single planning document for river, estuary and wetland management in each region and drive implementation of the management approach outlined in the *Victorian Waterway Management Strategy*. Each RWS outlines regional goals for waterway management. High value waterways are identified and from those a subset of priority waterways are determined for an eight-year planning period.

For coastal regions, the RWS includes the management of estuary health, highlighting the importance of estuaries as the link between catchments, coasts and the marine environment.

<https://www.water.vic.gov.au/waterways-and-catchments/rivers-estuaries-and-waterways/strategies-and-planning>

**Summary report**

The output of Stage 2 includes a concise summary report for project partners articulating:

- The work/process undertaken for this stage, including the engagement and communication process and who contributed
- A summary of local aspirations and values
- A shared vision and objectives for coastal hazard risk management and adaptation
- Summary of key updates to the Project Plan during / at conclusion of Stage 2.



Middle Park

**2.2 Develop a shared vision and objectives**

The process of developing a shared vision and objectives for coastal hazard risk management and adaptation is important to:

- Generate interest and support from project partners and communities
- Set the direction for adaptation
- Align the work with project partner and community needs and preferences
- Create a positive driver/goal for change.

The vision should be aspirational and long-term (2100+). Objectives may be more applied for specific issues and timeframes.

The approach to creating a shared vision should engage all project partners and coastal communities through tailored engagement and communication activities.

**Stage 2 checklist**

Readiness to progress checklist	
Does the Stage 2 summary report have in principle support of the project partners? – noting iterative refinements may continue as the next Stages progress.	
Has the scope for Stages 3 – 6 been reviewed and updated in the Project Plan based on the work completed for Stage 2?	
Are all updates to the Project Plan supported by the project partners?	

# Stage 3 - Coastal hazard exposure

Stage		Across all
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	Collaborative process
Stage 4	Vulnerability and risk	
Stage 5	Adaptation options	Engagement and communication
Stage 6	Plan and take action	
Stage 7	Ongoing monitoring and review	

## Engagement & communication

A tailored engagement and communication process should continue across Stage 3 as per the approach to creating a collaborative process (Stage 1.4) and activities detailed in the Project Plan.

Activities should include participatory approaches to enable a two-way flow of information. For Stage 3 this may include:

- Site visits, workshops, meetings, and online sessions, surveys - to support the technical work, including the scope of coastal hazard assessments, data sources, observations, verification.
- Use of physical demonstrations – e.g. wave tanks, to build capacity and promote conversations on hazards and adaptation
- Ongoing partnership discussions with Traditional Owners, including consideration of coastal hazard assessment needs
- Tailoring of key messaging for Stage 3 and for different audiences – e.g. to introduce key concepts on coastal processes, hazards, climate change and adaptation, and seek input and communicate outcomes. Example key messages are provided in Attachment F.

This section provides an overview of:

- Stage purpose
- Engagement and communication
- Define the geomorphic setting
- Understand the coastal processes and drivers of change
- Confirm the coastal hazards
- Adopt best practice scenarios
- Collate / generate coastal hazard data / information
- Stage 3 summary report
- Stage 3 checklist.

## Stage purpose

The purpose of this stage is to assess coastal hazard exposure for the area of interest, including scenarios that enable best practice approaches to risk assessment and adaptation planning.

Additional content to several parts of the Stage 3 guidance is provided in 'Victoria's Resilient Coast Stage 3 – Coastal hazards extended guideline' (Attachment A). The extended version also updates and replaces the previous content in the 'Victorian Coastal Hazard Guideline' (DELWP 2012).

### 3.1 Define the geomorphic setting

The dynamic and diverse Victorian coast extends 2500km from Cape Howe in the east, to the Glenelg River mouth in the west.

Victoria's coastal landforms include a variety of geomorphological features that evolved as a result of interactions between geological factors and coastal processes such as ocean swell, storm surge, currents, prevailing wind, changing sea levels and tidal movement.

Sea level has been around its current elevation ( $\pm 1.5$  m) over the past 6000 years and it is over this period that coastal processes have formed and re-shaped the sandy coastlines and some of the soft-rock cliffs we are familiar with today.

Dominant landscape classes across the Victorian coastline include extensive sandy shorelines, rocky coasts, and dynamic estuary systems (Table 9).

To understand coastal hazard exposure for regional and place-based contexts, this first step involves summarising/assessing the geomorphic setting including:

- **Landscape geology** – broad landscape context within Victoria
- **Shoreline classes** (Table 9) - used to provide an appreciation for the nature of the coastal setting, and to link the shoreline typology to coastal processes and hazards.
- **Coastal compartments** (Figure 9) - used to delineate the study area of interest based on landforms and sediment transport processes, and provide a foundation for coastal process / hazard assessments.

Primary and secondary compartments should be identified and used to refine study areas. Tertiary compartments are used to inform technical assessments within the study area if required.

Further detail and guidance on understanding the geomorphic setting and coastal delineation is provided in the extended guideline (Attachment A).

Table 9. Victorian coastal settings/classes\*

Setting / shoreline class		Length (km)	%
Sandy shorelines	Beaches are formed from a combination of terrestrial and marine-derived sediments. In Victoria, sandy shorelines cover extended sections of the open coast, as well as smaller pocket or compartmentalised beaches.	1002	38%
Low earth scarp shorelines	Low earth scarp shorelines or 'muddy' coasts are typically restricted to the low-energy environments of large bays and consist of low cliffs and scarps, intertidal flats consisting of silty sand or peat materials, often colonised by mangroves, seagrasses or saltmarsh vegetation.	138	5%
Hard rock cliffs with platform and/or beach	Rocky coasts are the result of the weathering of ancient rocks over millennia by marine and atmospheric processes such as waves, currents and winds. They comprise a range of landform types, including hard rock coasts (e.g. granite, basalt, sedimentary) and soft rock coasts (e.g. limestone, clay), and occur on open coasts and estuarine areas.	528	20%
Soft rock cliffs with platform and/or beach		144	5%
Estuarine and tidal channels	Over one hundred streams enter the sea either via estuaries and tidal channels. Around 85% of Victoria's estuaries are Intermittently <i>Closed</i> and <i>Open</i> Lakes and Lagoons ICOLLs.	671	25%
Engineered coastline	Some sections of the coast have been significantly modified over time with the use of infrastructure – seawalls, drains, groynes.	160	6%

\*Additional detail on shoreline classes provided in Attachment A extended guideline

Figure 9. Coastal compartments<sup>11</sup>

The Marine and Coastal Policy 2020 directs planners and decision makers to consider marine and coastal processes “in the context of their coastal compartment type”.

**Coastal compartments** are spatial units, identified along the coast where there is a strong connectivity between submarine morphology, substrate, marine processes, sediment availability and transport and backshore landforms. A coastal sediment compartment is a section of coast which shares a common sediment resource with clearly defined physical boundaries.

The purpose of coastal sedimentary compartment analysis is to determine the nature and paths of sediment transport (onshore-offshore and alongshore) in coastal systems.

The national coastal compartments approach to coastal classification (Thom *et al.* 2018) is hierarchical, descending from the 2 coastal “provinces” (tropical and temperate) based on climate, 7 coastal “divisions” based on coastal orientation, 23 “regions” based on geology and coastal configuration, 102 “primary compartments” determined by coastal structural features such as headlands and large bays, and ~350 “secondary compartments” on geomorphology.

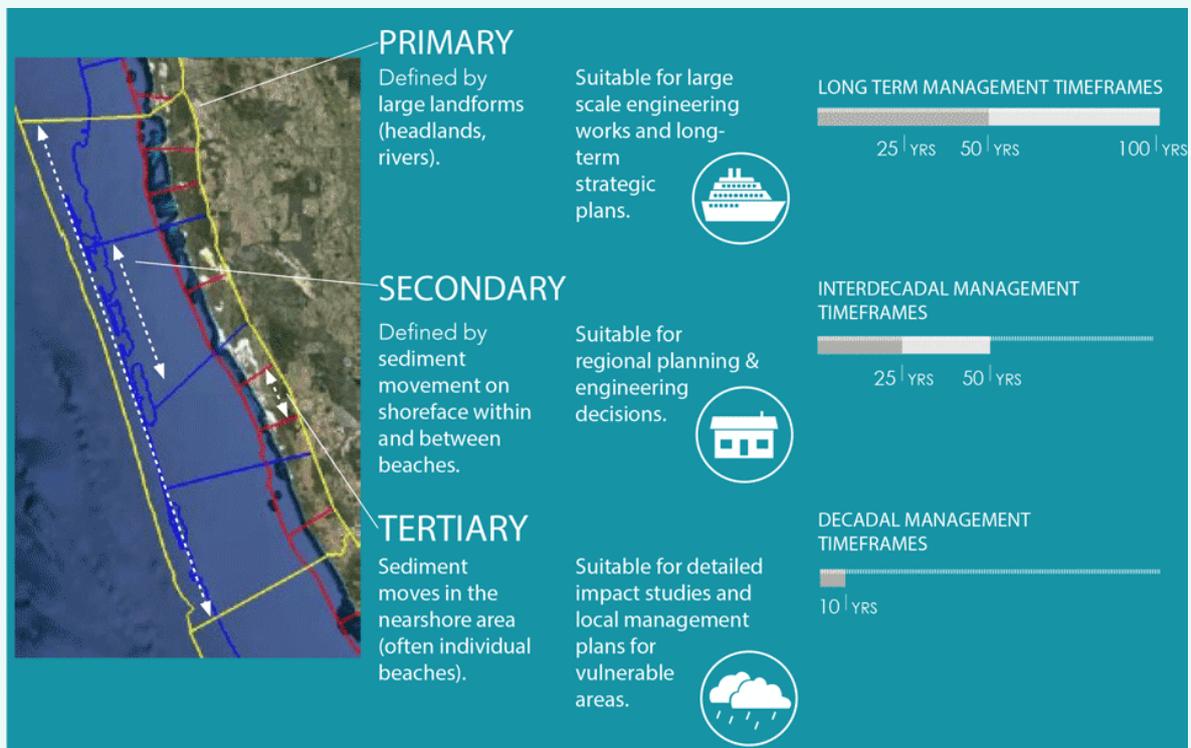


Figure 8. Coastal compartment scales, use and timeframes

The Smartline map (<https://coastadapt.com.au/coastadapt-interactive-map>) was developed to provide a single, consistent map of coastal landforms for the entire Australian coast. The Smartline map divides the coastline into distinct segments; within each, multiple GIS attributes describe the dominant coastal landforms.

The Victorian coast is comprised of six primary compartments and 23 secondary compartments (Table 10).

There is currently no comprehensive tertiary compartment mapping nationally, and given the dynamic nature of shorelines at finer spatial and temporary scales, tertiary assessments are best undertaken as needed for specific projects. Guidance on the approach for classifying tertiary compartments is provided in the extended guideline in Attachment A.

<sup>11</sup> Thom, B. *et al* 2018 “National sediment compartment framework for Australian coastal management”.

Table 10. Victorian Primary and Secondary coastal compartments

Primary Compartment	Secondary Compartment	Included area
<b>Western Victorian Coast</b>	Discovery Bay	From Cape Nelson to Danger Point (Brown Bay, SA)
	Portland Bay	From Port Fairy (Griffiths Island) to Cape Nelson
	Warrnambool	From Peterborough (Wild Dog Cove) to Port Fairy (Griffiths Island)
	Port Campbell	From Cape Otway to Peterborough (Wild Dog Cove)
<b>Otway Coast</b>	Great Ocean Road	From Split Point to Cape Otway
	Torquay	From Point Lonsdale to Split Point
<b>Port Phillip</b>	Port Phillip Bay (west)	From Williamstown to Point Lonsdale
	Port Phillip Bay (mouth)	From Point Nepean to Point Lonsdale
	Port Phillip Bay (east)	From Point Nepean to Williamstown
	Mornington Peninsula	From Cape Schanck to Point Nepean
	Cape Schank-Flinders	From West Head to Cape Schanck
	Western Port	From Point Grant to West Head
	Kilcunda	From Cape Paterson to Cape Woolamai
	Venus Bay	From Cape Liptrap to Cape Paterson
	Waratah Bay	From Tongue Point to Cape Liptrap
	Wilsons Promontory (southwest)	From South Point to Tongue Point
<b>Wilsons Promontory</b>	Wilsons Promontory (east)	From Entrance Point to South Point
<b>Ninety Mile Beach</b>	Corner Inlet	From McLaughlins Beach Outlet to Entrance Point
	Gippsland Lakes	From Red Bluff to McLaughlins Beach outlet
	Snowy River	From Cape Conran to Red Bluff
<b>Cape Howe</b>	Croajingalong	From Rame Head to Cape Conran
	Mallacocta Inlet	From Cape Howe to Rame Head

## Cape to Cape Resilience Project

### Cape Paterson to Cape Liptrap - the study area

The study area for the Cape to Cape Resilience Project is between Cape Paterson and Cape Liptrap. The area of interest includes:

- The open coast from Cape Paterson along the coastal cliffs adjacent towards Inverloch
- The open foreshore and surf beach at Inverloch
- The dynamic estuaries and tidal mudflats of Anderson Inlet
- The open coast and dunes of Venus Bay south to Cape Liptrap
- Inland from the coastline, allowing for assessment of estuary and groundwater impacts.



## 3.2 Understand the coastal processes and drivers of change

### Variables

The key physical processes that drive change in the coastal zone include climate, oceanography and corresponding geomorphology.

For a given study area, tailored coastal processes assessments are required to inform an appreciation of, and any modelling and assessment of, coastal hazard exposure.

Coastal processes assessments include collating and synthesising regional and place-based information on key variables including:

- Climate:
  - Global climate processes
  - Regional/local wind, air pressure, rainfall.
- Ocean Systems:
  - Bathymetry
  - Waves and currents
  - Water levels – tide, storm tides, sea-level rise.
- Geomorphic processes:
  - History of erosion / accretion
  - Topographic and bathymetric features and changes (e.g. dynamic dunes, beach, cliffs, estuary processes)
  - Sediment dynamics.

The extended guideline (Attachment A) provides details on these variables for the Victorian coast, and further guidance for assessments.

Associated data sources for assessing coastal processes are noted in Section 3.5.

### Climate change

Long-term observed records show that Victoria's climate is changing under the influence of both natural variability and climate change. The Victorian Coastal Council Science Panel (2018) summarised the projected coastal impacts of climate change in Victoria as:

- **Temperature:** increased average temperature (between 0.6 and 1.3°C by 2030, and between 1.1 and 3.2°C by 2070 relative to the climate of 1986 to 2005); increased heatwaves and fewer frosts
- **Rainfall:** less (total) rainfall in winter and spring; more frequent and more intense downpours
- **Fire danger:** Harsher fire weather and longer fire seasons
- **Sea level:** Global sea levels are expected to rise between 0.61 and 1.10 metres by 2100 above 1986-2005 levels under a high-emissions scenario, with a global average 0.84 metres. Victoria's policy setting requires planning for not less than 0.8m sea level rise by 2100.
- **Oceans:** increased wave height in winter, increased frequency of easterly winds, warmer and more acidic oceans, with sea-surface temperatures rising by between 1.1 and 2.5°C by 2070.

The Victorian coastline is expected to experience the following changes in key climate variables due to climate change:

- Wind speeds to increase by up to 19% by 2100.<sup>17</sup>
- Warmer temperatures with an increase in mean temperature of up to 3.2°C by 2070; more hot days and warm spells.<sup>18</sup>
- Reductions in rainfall in winter and spring, combined with an increase in downpour intensity and frequency.

Example impacts for coastal regions are summarised in Figure 10.

The extended guideline (Attachment A) provides additional detail on climate change and implications for the Victorian coast.

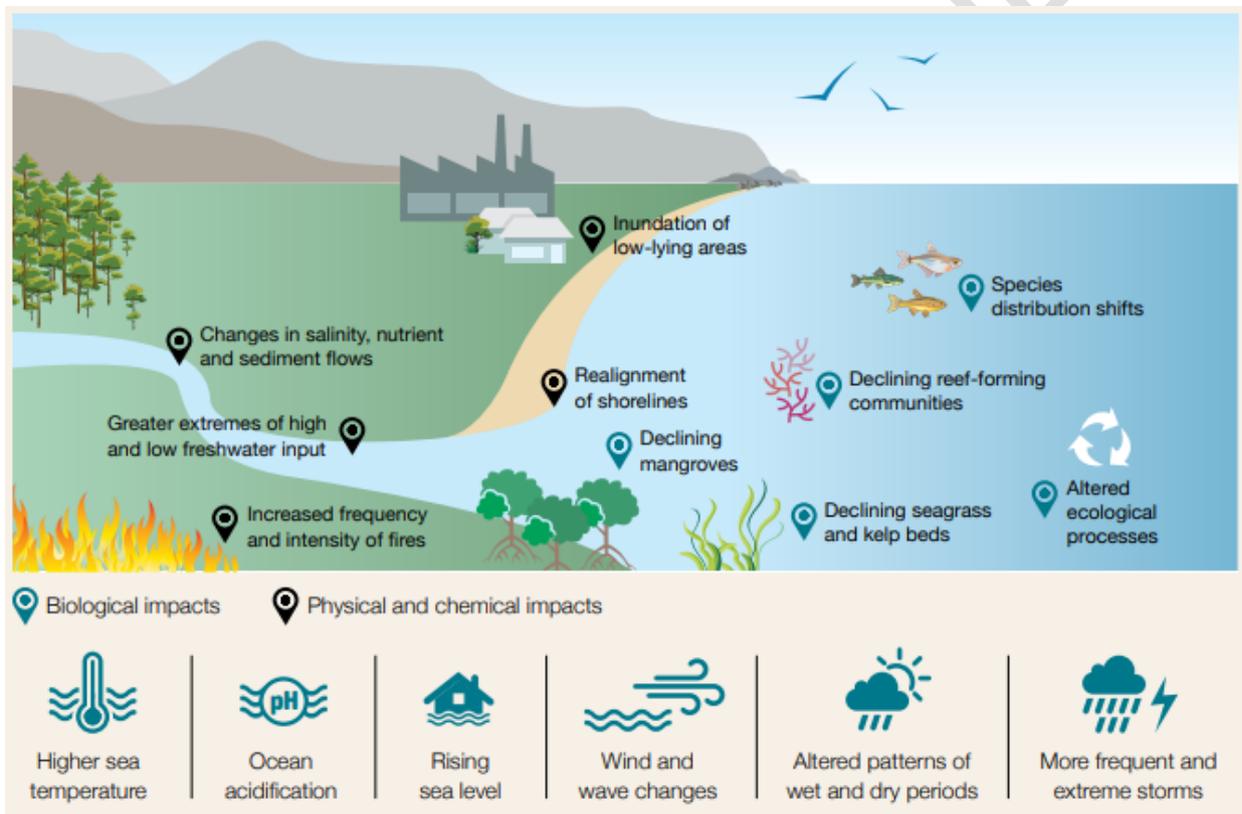
Additional drivers of change that may influence coastal processes and hazard exposure include:

- Population pressures
- Bushfire

- Extreme heat
- Severe wind
- Drought
- Geologic instability.

Additional drivers of change should be considered as relevant to coastal hazard adaptation in regional and place-based contexts.

Figure 10. Likely changes to Victoria’s coast caused by climate change<sup>12</sup>



<sup>12</sup> Victorian Coastal Council Science Panel, 2018. "Victoria’s Coast and marine environments under project climate change: impacts, research gaps and priorities".

### 3.3 Confirm the coastal hazards

At times, coastal processes including erosion, inundation, and other physical/chemical processes, may have a negative impact on coastal values and uses. When this occurs, we often refer to these processes as coastal hazards.

Coastal hazard definitions vary nationally and are tailored to the policy contexts for each State. Definitions for Victoria have been updated through the development of *Victoria's Resilient Coast* guidelines, and build on the previous definitions in the Victorian Coastal Hazard Guide (2012).

Definitions developed for Victoria (Table 11) provide a baseline for coastal hazard types that should be considered in relation to coastal hazard management and adaptation.

Additional hazards may be of relevance in some areas, and should be included if/as required to address place-based adaptation needs.

Strategic coastal hazard risk assessment and adaptation planning in a regional context should include:

- Identifying the range of relevant hazards in the study area based on the Victorian definitions
- Ensure the scope of assessments for each hazard is fit-for-purpose to meet the needs of the project partners, and enable adaptation planning.



Jan Juc

Table 11. Victorian coastal hazard definitions

Category	Process / hazard	Setting/classes include:	Mechanisms	
Erosion	<b>Short-term erosion:</b> Event-based erosion of sediment (storm-bite) and recovery	<b>Sandy shorelines</b>	Sandy coast/embayments, beach ridge systems, barrier systems, and sandy spits.	Erosion generally associated with storms or with elevated water levels. Can be driven by ocean or localised wind waves or tidal currents, as well as overland flow/drainage. Susceptible to short and long-term erosion.
		<b>Low-earth scarp</b>	Wide intertidal flats, silty sand or peats and muds. Narrow sandy beach may exist.	Erosion primarily associated with a low active scarp cut into soft, poorly consolidated sediment. May also be influenced by overland flow and drainage. Erosion is typically long-term recession.
	<b>Long-term erosion (recession):</b> Progressive retreat of shoreline position over time	<b>Soft rock</b>	Soft rock cliffs with and without a beach.	Erosion associated with combined terrestrial processes and wave action causing weathering, undercutting, slumping, slope failures (landslip).
		<b>Hard rock</b>	Hard rock cliffs with and without a beach.	Erosion associated with terrestrial processes and wave action causing weathering, undercutting, slope failures (landslip) and cliff-falls.
Accretion	Build of sediment in a localised area	All shoreline types	Shoreline, dunes and intertidal zone	Localised build up of sand, typically driven by long-shore sediment transport and well as influenced by erosion processes.
Inundation	<b>Permanent inundation</b> Regular or persistent inundation by the regular tidal cycle	All low-lying coastal land	Low-lying shoreline areas, coastal floodplains, estuary margins	Occurs when low-lying areas are regularly flooded due to tidal processes. Understanding the scale of inundation and associated impacts is required over various sea level rise scenarios.
	<b>Storm tide inundation</b> Temporary event-based inundation	All low-lying coastal land	Low-lying shoreline areas, coastal floodplains, estuary margins	Caused by a combination of predicted tides, storm-surges, and high wave action during severe storm events. Results in elevated water levels (storm surge), wave setup and wave runoff causing overtopping and inundation.
Estuary dynamics	Changes in form and processes associated with estuarine and tidal areas	Estuary / tidal areas	Estuaries, Intermittently Open and Closed Lakes or Lagoons (ICOLLs), river or creek mouths, coastal lakes; natural and constructed drains.	Highly dynamic sediment environment in response to tides, sea level, storm events and catchment runoff. Resultant variations in channel alignments, sandy spits and entrance opening and closure.
Off-shore sediment dynamics	Changes in form and processes associated with off-shore bathymetry and sediment transport	Up to 3 nautical miles offshore	Off-shore sea-bed beyond the intertidal zone, including channels and sediment slugs	Dynamic submarine sediment transport environment offshore, influenced by tides, sea level, and storm events. Resulting variations in sea-bed bathymetry and sediment dynamics.
Saline intrusion	Movement of saltwater into freshwater areas / groundwater	Up to 5km inland from high water mark	Freshwater aquifers, springs, and systems in low-lying coastal areas.	Rising sea levels may result in movement of seawater inland, including elevated groundwater and extension of salt water

### 3.4 Adopt best practice scenarios

Best practice in coastal hazard risk management and adaptation planning requires an approach that includes multiple scenarios - including planning horizons to 2100, and a range of hazard event likelihoods.

#### Planning horizons

To select planning horizons, the following principles of **alignment**, **consistency**, and **relevance** apply. This includes:

- **Alignment**
  - Consider planning horizons of key strategies at the local scale.
  - Consider planning horizons of corporate planning cycles at the local and regional scale.
  - Consider the timeframe of the local land use planning scheme in place and amendment cycles.
  - Consider integration opportunities with other planning activities at the local and regional scale.
- **Consistency**
  - Consider the time steps that global or regional projected data is modelled in.
  - Consider national or state-wide climate change policy or planning instruments.
  - Consider advancement in best practice.
- **Relevance**
  - Consider IPCC assessment reporting time periods (approximately every 6-7 years).
  - Select a number of relevant trigger points/thresholds (e.g. shoreline position, year or sea level increments) to enable appropriate adaptation to be implemented as necessary.

#### Example planning horizon considerations

- Climate data is typically modelled to the years 2050 and 2100 (e.g. IPCC 6<sup>th</sup> Assessment Report).
- Coast Adapt sea level rise data is modelled to the years 2030, 2050, 2070, and 2090.

Planning horizons can either be set time steps based on specific year intervals (e.g., 2050), be a period of time (e.g., medium-term) or be a number of years from plan creation (within 50 years), or based on incremental sea level rise points (Figure 11).

Figure 11. Example planning horizons

Period	Time step	Horizon	Sea level rise*
Base line	Baseline of historic and current data	Present day	MSL
Short term	10 to 25 years	2040	MSL + 0.2m
Medium term	25 to 50 years	2070	MSL + 0.4 m
Long term	50 to 100 years	2100	No less than MSL + 0.8 m
Sensitivity scenarios (examples)		2100	1.1
			1.4

\*Subject to future updates in sea level rise benchmarking

For coastal hazard adaptation planning, a minimum of three planning horizons should be included, including present day, 2100 and an interim horizon, and their associated sea level rise projections.

Policy 6.1 of the Marine and Coastal Policy states “Plan for sea level rise of not less than 0.8 metres by 2100, and allow for the combined effects of tides, storm surges, flooding, coastal processes and local conditions such as topography and geology, when assessing risks and coastal impacts associated with climate change.”

Global sea levels are expected to rise between 0.61 and 1.10 metres by 2100 above 1986-2005 levels under a high-emissions scenario, with a global average 0.84 metres.

Alignment of sea level rise increments to planning horizons should be based on the Marine and Coastal Policy (2020) and future updates to sea level rise benchmarks.

Best practice also includes sensitivity scenarios for 2100 sea level rise projections, including 1.1m and up to 1.4m + scenarios.

**Hazard event likelihoods**

To enable a best practice approach to assessing coastal hazard risk (Stage 4), hazard exposure must be assessed for multiple event likelihoods for each planning horizon.

This also enables a best practice, probabilistic approach to economic analysis (Stage 4 & 5).

To select event likelihoods, the following principles of **alignment, consistency, and relevance** apply. This includes:

- **Alignment**

- Consider place-based contexts, such as drainage network design events (e.g. 20% AEP) and other strategic planning considerations.
- Align with ISO31000 risk assessment (used in Stage 4) and a spectrum of event likelihoods that enables a robust risk assessment.

- **Consistency**

- Consider possible interactions between hazards (potential for multi-hazard assessment)
- Consider the range of hazards in the study area (e.g., riverine flooding) and select event likelihoods that can be consistently applied for multiple hazards (e.g. erosion and inundation)
- Consider what event likelihoods may have been previously assessed in the study area and what is required to add value or further understand risk.

- **Relevance**

Consider values identified in the study area and what event likelihoods are most applicable for place-based coastal values.

Annual exceedance probability (AEP) is the primary metric used to define event likelihood.

*An ‘Annual Exceedance Probability’ (AEP) is the probability that an event of a given (or larger) magnitude will occur within a period of one year.*

*This means that in any given year there is a 1% chance of that magnitude of event occurring.*

For coastal hazard adaption planning, a minimum of three event likelihoods for the relevant technical assessments should be included. This should include the 1%AEP, a smaller event (e.g. 10%AEP), and a larger event (e.g. 0.2% AEP).

In a probabilistic context, AEP event likelihoods are often assigned a descriptor such as ‘likely, possible or rare events’ (Table 12). There is a range of different guidance on likelihood descriptors nationally and in different contexts (climate, general risk management, hazards). In practice, these descriptors can be assigned based on what is most appropriate language for different place based contexts.

**Table 12. Example spectrum of coastal hazard event likelihoods**

Hazard AEP / event likelihood	Example descriptors
MHWS	Almost certain
20%	Likely
10%	
5%	
2%	Possible
1%	
0.2%	Rare

\* Mean High Water Springs

### 3.5 Collate / generate coastal hazard data / information

To recap, by this point in Stage 3, coastal hazard risk management / adaptation projects will have:

- Identified a study area and defined the geomorphic setting (3.1)
- Documented an appreciation for relevant coastal processes, history of coastal change and drivers of change (3.2)
- Confirmed the relevant coastal hazards to be included in assessments and planning (3.3)
- Confirmed the hazard scenarios to be assessed – including planning horizons and event likelihoods (3.4).

The next step is to collate / generate coastal hazard data and information for each of the hazards and scenarios.

This requires developing and delivering a tailored coastal hazard assessment scope of work - to provide the required technical information on coastal processes and hazard extents. These are complex technical assessments requiring specialist skills and experience.

A guide on the range of data and information available (and from where, e.g. Figure 12) to inform coastal hazard exposure assessments is

provided in the extended guideline (Attachment A).

A Data Assimilation and Gap Assessment should be undertaken in preparation for developing a detailed Coastal Hazard Assessment to identify available data and opportunities for additional data collection.

In scoping a hazard assessment to inform adaptation planning, projects should consider:

- What hazard information is already available and fit-for-purpose?
- What new data / assessments may be required?
- Which hazards require detailed modelling approaches?
- Are conceptual models fit for purpose for some hazards?

Additional guidance towards scoping tailored coastal hazard assessments provided in the extended guideline (Attachment A).

An agreed scope for the coastal hazard assessment, including types of hazards included, scenarios, events, spatial and temporal extents, data and modelling approaches and limitations, and agreed outputs (data, maps), is an important **hold point** before progressing to next Stages.

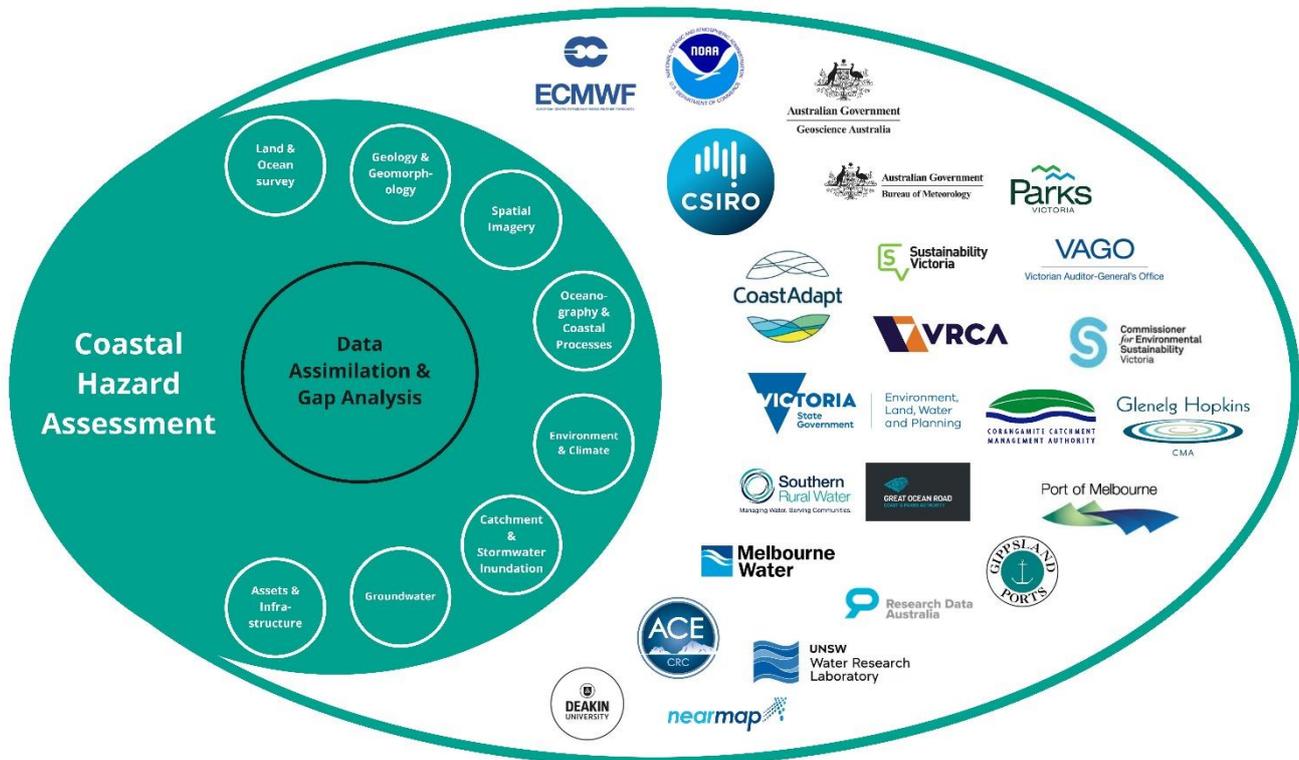


Figure 12. Range of data types and sources available to inform coastal hazard assessments

All project partners should endorse that the **scope** of the coastal hazard assessment is fit-for-purpose to progress risk management and adaptation planning.

Iterative feedback from Stages 2 – 4 may also require updates to the scope of the hazard assessment, including additional technical studies or hazard scenarios to address specific adaptation needs. A process to enable this should be allowed for in the scoping process.

All project partners should also endorse that the **outputs** of the hazard assessment are fit-for-purpose.

**Victorian Coastal Monitoring Program (VCMP)**

The VCMP was initiated in 2017 and is being led by DELWP's Environment and Climate Change group. It involves monitoring of wave climate, shoreline changes, sediment movement and sediment budgets in priority coastal compartments of Victoria's open coastline, Western Port Bay and Port Phillip Bay.

Knowledge of sediment budgets help us to identify which areas of Victoria's are likely to lose or gain sediment under sea level rise and changes to wave directions. This assessment is crucial for understanding current processes and predicting future effects to undertake informed coastal adaptation planning and investment.

The creation of partnerships with community groups (citizen science) and institutions to co-invest in coastal monitoring projects at both regional and local scales has been central to the success of the VCMP.



**Local Coastal Hazard Assessments**

Four third-pass Local Coastal Hazard Assessments have been completed in Victoria with another two underway for Port Phillip Bay and Inverloch.

These assessments include a range of planning horizons and sea level rise scenarios (summarised below).

Hazard assessment	Planning horizon / sea level rise scenarios included
Port Fairy - 2013	Current, 2050 (0.4m), 2080 (0.8m), 2100 (1.2m)
Bellarine Peninsula – Corio Bay - 2015	Current, 0.2m, 0.5m, 0.8m, 1.1m, 1.4m
Western Port Bay - 2015	Current, 0.2m, 0.5m, 0.8m
Gippsland Lakes / 90 Mile Beach - 2014	Current, 2040 (0.2m), 2070 (0.4m) 2100 (0.8m)
Cape to Cape Resilience project (Inverloch and surrounds) (ongoing)	0.2m, 0.5m, 0.8m, 1.1m, and 1.4m
Port Phillip Bay Coastal Hazard Assessment (ongoing)	(in preparation)

These assessments have provided valuable information and improved understanding on current and future hazards. They also provide learnings on how to conduct coastal hazard assessments.

Information on these assessments and key lessons can be found at: [www.marineandcoasts.vic.gov.au](http://www.marineandcoasts.vic.gov.au)

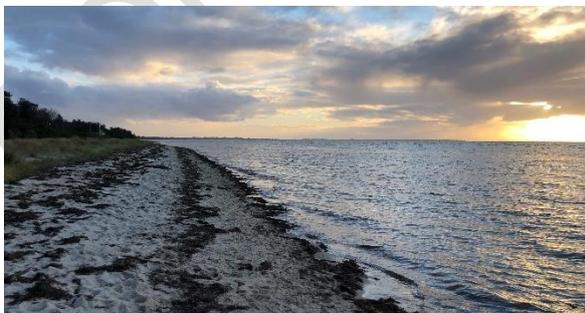
### 3.6 Stage 3 summary report

The output of Stage 3 includes a concise summary report for project partners articulating:

- The work/process undertaken for this stage, including the engagement and communication process and who contributed
- A summary of the study area and geomorphic setting, coastal processes including history of coastal change and drivers of change, hazard scenarios included for adaptation planning, and the technical coastal hazard assessment report and hazard exposure data/maps.
- Summary of key updates to the Project Plan during / at conclusion of Stage 3.

#### Stage 3 checklist

Readiness to progress checklist	
Does the Stage 3 summary report have in principle support of the project partners? – noting iterative refinements may continue as the next Stages progress.	
Has all coastal hazard data generated from Stage 3 been stored securely with the lead agency or designated project partner?	
Has the scope for Stages 3 - 6 been reviewed and updated in the Project Plan based on the work completed for Stage 3?	
Are all updates to the Project Plan supported by the project partners?	



Rosebud

# Stage 4 - Vulnerability and risk

Stage		Across all
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	
Stage 4	Vulnerability and risk	Collaborative process
Stage 5	Adaptation actions and pathways	Engagement and communication
Stage 6	Plan and implement	
Stage 7	Ongoing monitoring and review	

**Coastal vulnerability** – The susceptibility of people and places along the coast to adverse impacts from coastal hazards. Includes the degree of exposure, and ability to cope with, respond to and adapt to coastal hazards.

**Risk assessment** – A systematic process of evaluating the potential risks (likelihood and consequence) of coastal hazards, helping to inform a risk management response and adaptation actions.

## Engagement & communication

A tailored engagement and communication process should continue across Stage 4 as per the approach to creating a collaborative process (Stage 1.4) and activities detailed in the Project Plan.

Activities should include participatory approaches to enable a two-way flow of information. For Stage 4 this may include:

This section provides an overview of:

- Stage purpose
- Engagement and communication
- Assess exposure for values / uses
- Identify vulnerable areas
- Consider economic implications
- Undertake a tailored risk assessment
- Identify priorities for action
- Stage 4 summary report
- Stage 4 checklist.

- Site visits, workshops, meetings, and online sessions, surveys - to support the vulnerability and risk assessment work
- Specific design and presentation of vulnerability and risk mapping and results that is fit-for-purpose for consultation and sensitive to the needs of project partners
- Ongoing partnership discussions with Traditional Owners, including on cultural vulnerability and risk
- Tailoring of key messaging for Stage 4 and for different audiences – e.g. to introduce key concepts on coastal hazard vulnerability and risk, seek input and communicate outcomes. Example key messages are provided in Attachment F.

## Stage purpose

The purpose of Stage 4 is to provide a foundation for exploring place-based coastal hazard vulnerability and risk, to enable strategic consideration of coastal hazard risk management and adaptation needs/priorities.

This section updates and builds on from the guidance on risk assessments provided in the Victorian Coastal Hazard Guide (2012).

## 4.1 Assess hazard exposure

### Data collation

The first step in this Stage is to collate all relevant data for the coastal values and uses defined and agreed on by project partners in Stage 2. This includes:

- All spatial data for quantitative and semi-quantitative analysis of coastal hazard risk
- Any other qualitative data / information that may also inform assessments of vulnerability and risk.

Data should be sourced from all project partners as appropriate for the assessment.

There are a range of existing data bases used by land managers that relevant data can be collated from (e.g. asset management databases), including DELWP, Councils, Committees of Management, and region specific resources (e.g. Barwon-South West Investment Framework).

### Data analysis

Once all data has been collated, a detailed hazard exposure analysis is completed for all values and uses, and all hazard scenarios across public and private land.

This involves geo-spatial analysis of each hazard scenario with available data, including:

- Planning scheme zones and overlays
- Statements of Planning Policy and Precinct Structure Plans
- Places of environmental and cultural significance
- Infrastructure – buildings and facilities, transport, utilities.

Data should be collated and analysed in formats suitable for:

- Informing collaborative vulnerability and risk assessments for strategic planning
- Providing the exposure assessment data back to each land manager / data custodian to inform their existing programs.

Outputs should include a geospatial data base of point, linear and polygon feature classes with

associated exposure likelihoods for each hazard scenario.

Additional qualitative review for sensitive values and uses should also be included where spatial data is not available.

### Coastal protection assets on Crown Land

DELWP manages the performance of over 1,700 coastal protection assets on Crown land for both their community and amenity value and their role in protecting other coastal assets and infrastructure from coastal hazards.

The DELWP Coastal Protection Program aims to address critical erosion risks by maintaining, replacing or constructing new coastal protection assets across the Victorian coastline, and undertaking beach renourishment works in Port Phillip Bay. This program continues the Victorian government's efforts to ensure the longevity of key coastal locations and their associated values well into the future.

DELWP maintain a register of coastal protection assets on Crown land and their condition. Investment into the maintenance, repair or new assets on Crown land is guided by a statewide risk assessment and prioritisation process.

Statewide asset data and information on statewide priorities on Crown land is available to inform local and regional coastal hazard risk management and adaptation planning.

### Barwon South-West Infrastructure Investment Framework

The Infrastructure Investment Framework, led by the DELWP Land and Built Environment South West region, is an example of a strategic investment approach to understand risk and inform investment prioritisation.

All recreation assets in the Barwon South West Partnership area (Avalon – Marengo) have been GIS referenced and photographed to reflect the current condition of each asset, categorised into asset classes, and uploaded to a regional shared data platform. This data platform, once overlaid with up-to-date hazard mapping, will be used to better understand risk, asset service levels, maintenance scheduling and thresholds to determine investment priorities.

The project includes the development of an investment framework to provide a science-based decision-making process that prioritises strategic future investment. The framework will be piloted within the region with a view to greater use along the Victorian coastline.

The data platform and infrastructure priorities can also inform broader assessments of vulnerability, risk and coastal hazard adaptation through inputting into Stage 4 - 6 of Victoria's Resilient Coast framework.



Kennett River

### 4.3 Identify vulnerable areas

Vulnerability assessments include consideration of exposure, sensitivity, and adaptive capacity to coastal hazards.

They can provide initial information on the susceptibility of areas and communities to coastal hazards and are commonly undertaken prior to a risk assessment.

Assessments are generally applied to coastal hazard studies at a broader spatial scale, and can assist with:

- Informing an appreciation of vulnerable areas and communities for different hazard types
- Ensuring social, cultural and ecosystem vulnerability is a core element of adaptation planning
- Informing a range of strategic adaptation actions for social, cultural and ecosystem vulnerability
- Inform a range of strategic actions to improve adaptive capacity
- Assisting to prioritise focus areas for detailed risk assessments.

Vulnerability studies typically focus on social, cultural and ecosystem vulnerabilities, particularly elements of coastal values and use that do not have readily available spatial data for quantitative assessments of risk, or require a more bespoke investigation.

Assessments should:

- Be scoped and informed by project partners and the engagement process
- Focus on key place-based social, cultural and ecosystem vulnerabilities
- Use case studies to explore specific vulnerabilities and adaptation needs.

## 4.4 Undertake a tailored risk assessment

### Strategic risk assessment purpose

The purpose of the risk assessment process in Stage 4 is to:

- Identify and characterise the nature of coastal hazard risks
- Identify qualitative or quantitative estimates of risk
- Compare the sources of risk
- Assess the impacts of uncertainty
- Provide a basis for the strategic assessment and prioritisation of risk mitigation / adaptation.

### Risk definition

According to ISO 31000 2018, risk is the “effect of uncertainty on objectives”. An effect may be an adverse or positive deviation from what is expected.

The ISO 31000 conceptual definition of risk is useful to frame risk assessments in the context of goal-oriented terms, ensuring that risk is being assessed relative to the objectives for management/adaptation (e.g. as defined in Stage 2 of the VRC framework).

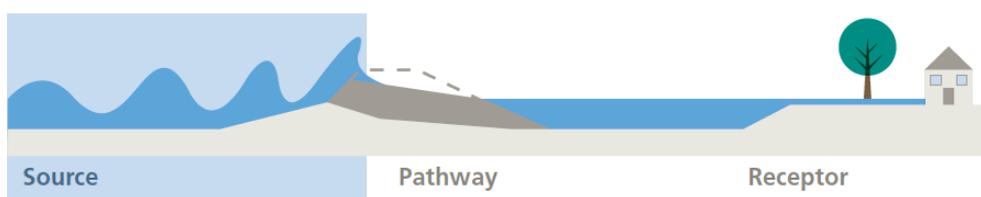
The more traditional concept of risk still provides the basis for operationalizing conceptual definitions – to quantify risk.

The traditional definition of risk combines the likelihood of an event occurring, combined with its potential consequence.

A widely used approach to illustrating risk analysis theory in relation to coastal hazards is based on the source–pathway–receptor concept.

The sources of risk are the coastal processes, the pathway is the associated hazards (e.g. inundation and erosion), and the receptors are the coastal values and uses (Figure 13).

Figure 13. Source-pathway-receptor concept for coastal hazard risk assessments (after Wahl and Jensen 2011)



<sup>13</sup> Risk management (delwp.vic.gov.au)

The strategic risk assessment includes consideration of all coastal hazard types, and the assessment is founded on the values and objectives identified in Stage 2.

Risk is the combination of the likelihood of the coastal hazard (involving both the source and the pathway) and the consequence to the receptor (Figure 14).

Figure 14. Risk equation

$$R = L \times C$$

where R = risk

L = likelihood of the coastal hazard occurring

C = consequence of the coastal hazard (to coastal values and uses – e.g. social, cultural, economic, environmental).

For best practice coastal hazard risk management and adaptation planning in Victoria, all risk assessments should align with *Australian Standard AS ISO 31000:2018 Risk Management – Guidelines* (“the ISO 31000:2018”), and the *Victorian Government Risk Management Framework (VGRMF)*<sup>13</sup> and *Guidelines*<sup>14</sup>.

The risk assessment guidance provided in this section for Stage 4 of Victoria’s Resilient Coast framework aligns with these guiding documents, and includes (Figure 15):

- Identifying the risk
- Analysing the risk
- Evaluating the risk
- Communication and consultation with internal/external stakeholders during all stages of the process.

Risk treatment, monitoring and review is embedded in later Stages 5 and 6 of *Victoria’s Resilience Coast framework*.

<sup>14</sup> DELWP Risk Management Guidelines (Zeeher and Khoo 2021)

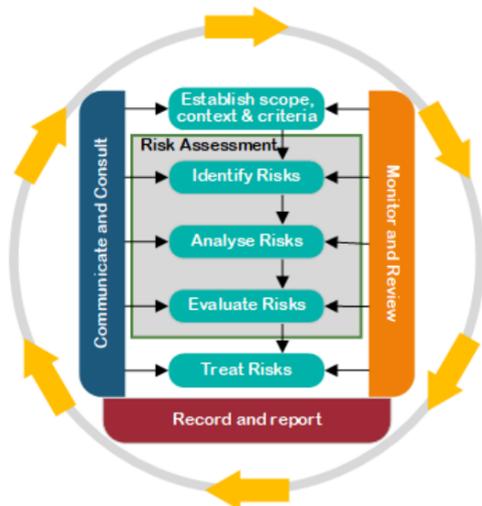


Figure 15. Risk management process (ISO 31000:2018)

**Identifying the risk**

Key concepts to be considered in identifying risk include:

- there is a degree of risk that is acceptable or tolerable
- risk varies over time
- risk varies spatially
- risks assessments need to match the scale of risk and the data or information available
- uncertainty needs to be considered.

The level of detail that must be considered in a risk assessment will depend on the quality of information used to derive an understanding of the coastal hazard, as well as the scale and the receptors potentially affected by that hazard.

Best practice approaches are typically semi-quantitative, combining all available qualitative and quantitative criteria into the assessment.

Higher level or ‘first pass’ risk assessments may be completed first to inform where more detailed risk assessment is focused.

Identifying coastal hazard risk for all values and uses involves defining:

- Risk likelihood
- Risk consequence
- Uncertainty.

The focus for coastal hazard assessments is typically on adverse consequences, to inform the development of an approach to hazard mitigation / adaptation. However beneficial consequences

of coastal hazards could also be included in the risk assessment if considered significant to an individual project context.

**Risk likelihood:** The likelihood of coastal hazard exposure is based on the probability of occurrence (the event likelihood - % AEP) (refer Table 12 and Table 14).

**Risk consequence:** The consequence of exposure should be a tailored place-based assessment considering the range of values and objectives identified in Stage 2, including:

- Traditional Owner values and connection to country
- Project partners, stakeholder and community feedback on the important aspirations, values and uses of the marine and coastal environment.

Detailed consequence criteria will vary for each project context, and should be refined through a participatory engagement process with project partners. Example categories / themes are provided in Table 13.

Consequence criteria can also be refined to align to project partner organisations risk management approaches.

**Risk level:** The coastal hazard risk level (e.g. low, medium, significant, high - Table 14) should be determined for all coastal values and uses in the compiled data, for each hazard scenario (type and event likelihood), and for each planning horizon.

**Uncertainty:** Although the risk assessment process provides a systematic and best practice approach, there will always be uncertainty. Uncertainty may relate to both the likelihood and the consequences of a hazard.

It is important to understand and define where uncertainty exists, to consider which uncertainties have the greatest potential to affect decisions, and to consider steps that could be taken to reduce the uncertainty.

Uncertainty may be clarified by expert judgement or further investigations and specialist assessment.

Uncertainty associated with the risk assessment must be clearly understood and communicated. One practical way to do this is to assign a confidence rating (low, med, high) to each risk level assigned in the output data, and associated notes on the source of the uncertainty.

Table 13. Example consequence matrix

		Example consequence categories/themes				
		Traditional Owner / biocultural landscape values	Environmental values	Social values	Infrastructure and services	Other (e.g. public safety, tourism)
<b>Consequence</b>	Extreme	Permeant adverse impact/loss of values* Recovery unlikely.			Damage and loss > \$X M Recovery > X years	
	Major	Major adverse impact on values* Recovery may take many years.			Damage and loss > \$X M Recovery > X years	
	Moderate	Moderate adverse impact on values* Recovery may take 1-2 years.			Damage and loss > \$X M Recovery > X years	
	Minor	Minor adverse impact on values* Recovery feasible within less than 1 year.			Damage and loss > \$X M Recovery > X years	
	Negligible	Negligible impact on values*			Damage and loss > \$X M Recovery > X years	

\* Detail for these should be defined with project partners and incorporate Stage 2 values and objectives.

Table 14. Example risk level matrix

		Consequence				
		Negligible	Minor	Moderate	Major	Extreme
<b>Likelihood</b>	Almost certain MHWS	Medium	Significant	High	High	High
	Likely 10% AEP	Medium	Medium	Significant	High	High
	Possible 1% AEP	Low	Medium	Medium	Significant	High
	Rare 0.2% AEP	Low	Low	Low	Medium	Significant

**Analysing and evaluating the risk**

Once risk has been attributed to all data, outputs can be mapped and analysed to identify:

- Coastal values and uses with medium to high coastal hazard risk
- % areas and number of values/uses/infrastructure with medium to high coastal hazard risk
- Critical values, infrastructure and services at risk
- The changing risk profile for different coastal values and uses – for example, if there is step-change in increasing risk level between certain planning horizons.
- Where there may be a step-change in the predicted coastal hazard risk (e.g. 2040 to 2070) assists to focus investment, and to sequence and time adaptation planning to mitigate risk before it occurs.

may not be captured in the available topographic data, or new coastal protection structures in erosion prone areas.

Where this is the case, the recent adaptation measures should be noted, including if/how this may change the understanding of residual risk for relevant hazards / locations.

Depending on the implications for residual risk and associated adaptation planning needs, updated data and a more detailed residual risk assessment may need to be sought for some hazards / locations.

An understanding of **risk tolerance** can also guide risk analysis and evaluation, to assist with understanding where priority actions should be focused.

**Table 15. Example risk tolerance matrix**

Example risk tolerance	
High	Falls outside project partners risk appetite. A risk that requires actions to avoid or reduce the risk.
Significant	May fall outside project partners risk appetite. A risk that requires action to be managed to a level that is as low as reasonably practicable.
Medium	Falls within project partners risk appetite. A risk that may be managed or accepted without further treatment, with active monitoring and regular re-evaluation.
Low	Well within project partners risk appetite. Business as usual is appropriate.

**Residual risk**

In some cases there may be adaptation measures / controls already in place to mitigate risk (that is not reflected in the available data used for the risk assessment).

For example, recent fill levels and building standards in mapped inundation prone areas

### 4.5 Consider economic consequences

In the absence of intervention/adaptation (the continuation of business as usual) there will be economic costs associated with coastal hazards.

Tailored economic analysis is an additional way to support assessments of coastal hazard vulnerability and risk, and inform adaptation decisions.

The first steps in an economic analysis involves valuing the **economic base case**.

The base case assists to inform an appreciation of current and emerging economic implications from coastal hazards. The base case:

- Provides additional detail on economic risk
- Provides an economic perspective on the need to proactively manage coastal hazard risk and adapt, useful for project scoping and business cases
- Contributes to the evaluation of adaptation options in Stage 5.

Developing a base case involves:

- **Assigning monetary values** (where applicable) using market and non-market approaches for a range of coastal values, uses and infrastructure, including local industries and ecosystem services
- **Assessing potential cost impacts** of coastal hazards for each planning horizon, based on probabilistic modelling using the multiple event likelihoods and planning horizons
- **Presenting base case data** and tailored narratives on place-based economic impacts - including Average Annual Damage (\$) for different hazard types (Figure 16), as well as for different values/uses, industry and services (e.g. Figure 17).

The extended guideline in **Attachment C** provides a five-step approach for using economics to inform coastal hazard risk and adaptation, including guidance on the range of tangible / in tangible values, how to develop a base case, and subsequent adaptation options analysis.

**Average Annual damage (AAD)** represents the average damage/cost per year that is expected to occur from coastal hazard impacts.

AAD is calculated using probabilistic analysis of a range of coastal hazard likelihood scenarios, and the cost consequence of exposure.

Figure 16. Hazard type example - overall Average Annual Damages for different hazards over multiple planning horizons

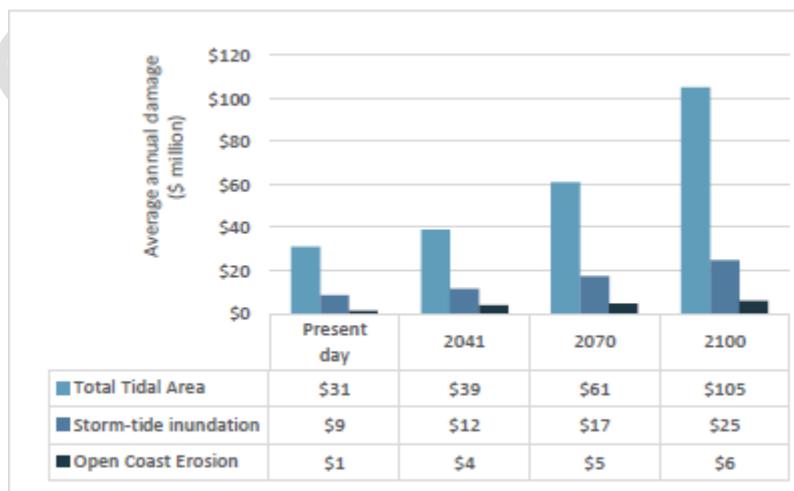


Figure 17. Ecosystem/industry example – estimated costs associated with 2100 inundation hazard exposure

Estimated total value (\$ million/year)	Estimate	Potential higher end estimate
Estimated total value of wetland ecosystem services gained	\$12M	\$70M
Estimated total value of agriculture foregone	\$2M	\$3M

### 4.6 Identify priorities for adaptation

The outputs of the coastal hazard vulnerability risk, and economic assessments will include a diversity of data and mapped information.

A strategic interpretation of the information is required to identify focus areas / issues / opportunities for adaptation.

This may include:

- Developing an overall narrative of coastal hazard vulnerabilities
- Summarising the coastal hazard risk assessment results, highlighting high risk areas and issues, and the changing risk profile to 2100
- Identifying where broader strategic actions may apply across multiple areas to address vulnerabilities and risk
- Identifying focus areas / issues for finer scale risk management and adaptation planning, including localities for tailored adaptation pathways.



Brighton

### Stage 4 summary report

The output of Stage 4 includes a concise summary report for project partners articulating:

- The work/process undertaken for this stage, including the engagement and communication process and who contributed
- A summary of the approach to the vulnerability, risk and economic assessments, results, and mapping from the analysis
- Summary of key updates to the Project Plan during / at conclusion of Stage 4.

### Stage 4 checklist

Readiness to progress checklist	
Does the Stage 4 summary report have in principle support of the project partners? – noting iterative refinements may continue as the next Stages progress.	
Has all vulnerability and risk data generated from Stage 4 been stored securely with the lead agency or designated project partner?	
Has the scope for Stages 3 - 6 been reviewed and updated in the Project Plan based on the work completed for Stage 4?	
Are all updates to the Project Plan supported by the project partners?	

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# Stage 5 - Adaptation actions and pathways

Stage		Across all
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	
Stage 4	Vulnerability and risk	Collaborative process
Stage 5	Adaptation actions and pathways	Engagement and communication
Stage 6	Plan and implement	
Stage 7	Ongoing monitoring and review	

## Engagement & communication

A tailored engagement and communication process should continue across Stage 5 as per the approach to creating a collaborative process (Stage 1.4) and activities detailed in the Project Plan.

Activities should include participatory approaches to enable a two-way flow of information. For Stage 5 this may include:

- Site visits, workshops, drop-in sessions, meetings, online sessions, including to inform options discussions and tailored multi-criteria analysis and economic analysis
- Use of physical demonstrations – e.g. wave tanks, to demonstrate and promote conversations of adaptation options and implications for coastal values and uses
- Ongoing partnership discussions with Traditional Owners, including on adaptation options and priorities
- Tailoring of key messaging for Stage 5 and for different audiences – e.g. to introduce key concepts on the range of adaptation options, options assessment, seek input and communicate outcomes. Example key messages are provided in Attachment F.

This section provides an overview of:

- Stage purpose
- Engagement and communication
- Consider options and actions
- Develop a pathways outline
- Assess and select actions
- Refine adaptation pathways
- Stage 5 summary report
- Stage 5 checklist.

## Stage purpose

The purpose of Stage 5 is to identify, assess, consult on and decide which adaptation options and actions are the most appropriate for managing the current and future coastal hazard risks in the study area.

This includes a diversity of integrated actions across land management, planning and design, nature based and engineering themes.



Barwon Heads

## 5.1 Consider options and actions

### Strategic adaptation options

The Marine and Coastal Policy (2020) sought to re-frame how coastal hazards are managed in Victoria, to facilitate more balanced and positive management options for the long-term benefit of Victoria's coastline.

*Please review the Introduction section of this Victoria's Resilient Coast guideline for key foundational context on policy directions, risk, resilience and adaptation, and adaptation pathways.*

To reiterate some of the introductory context of this guideline (refer Table 4, Figure 5, Figure 6), for the management of coastal hazard risk and adaptation planning, Chapter 6 of the Marine and Coastal Policy (2020) requires land managers to:

- Consider strategic **adaptation options** in a certain order:
  1. Non-intervention
  2. Avoid
  3. Nature-based
  4. Accommodate
  5. Retreat
  6. Protect.
- Apply an adaptation pathways approach.

In practice, the hierarchy order must be considered and demonstrated when developing an approach for managing coastal hazard risk and developing an adaptation plan.

This is consistent with national best practice approaches as well, where there is a focus on first seeking to avoid risk, and then the main-streaming of nature based methods and working with natural coastal processes.

### Types of adaptation actions

There are a wide range of adaptation actions that can be built into adaptation pathways to assist with managing coastal hazard risk. These can be broadly classified under three key functional types (Table 16):

- Land management, planning and design
- Nature-based
- Engineering.

Adaptation actions are not mutually exclusive, and often a suite of measures is required to effectively manage coastal hazard risk, enabled through an adaptation pathways approach.

The **Adaptation Actions Compendium (Attachment B)** developed as a *Victoria's Resilient Coast* guideline resource, provides information on the different actions across each functional type.

The compendium includes guidance on when and where different actions may be applicable, and example projects.

#### In this guideline:

**Adaptation options** are different strategic approaches to managing coastal hazard risk, and in Victoria are considered in the order of non-intervention, avoid, nature-based, accommodate, retreat and protect.

**Adaptation actions** are the range of tools, decisions and works that can be implemented to create adaptation pathways aligned to the strategic options.

The Adaptation Actions Compendium is provided in **Attachment B**.

Table 16. Coastal hazard adaptation actions (details provided in Attachment B compendium, examples in Figure 18 - Figure 21)

Functional type		
Land management, planning and design	Land use	Land acquisition
		Land swap
		Controlled access
		Planning scheme zone amendment
		Planning overlays
		Rolling easements
		Relocation of infrastructure
		Special area planning
	Resilient design / development	Development setbacks
		Design standards / provisions
Codes of practice		
Retrofit / use resilient infrastructure materials		
Retrofit / use resilient infrastructure design (e.g. floor levels, layout)		
Nature-based	Coastal wetlands / blue carbon ecosystems	Mangrove forests
		Seagrass
		Salt marsh
		Kelp forests
	Dune ecosystems	Dune protection / vegetation
		Beach scraping / nourishment*
		Use of on-site natural materials
	Hybrid actions	Shellfish reefs
		Living shorelines
		Living seawalls
Engineering	Nourishment*	Sand fencing
		Beach scraping
		Cart and place
		Dredge and pump
	Dredging	Sand by-pass system
		Management of offshore channels / dynamics
	Seawalls	Vertical seawall
		Rock revetment
		Geobag revetment / wall
	Groynes	Rock
		Geobag
		Timber
	Breakwaters	Off-shore
		Near-shore
Tomboles		
Flood/tidal barriers	Levees/dykes	
	Tidal / surge barriers	
	Tidal gates	
	Saline groundwater intrusion barrier	
Drainage network	Pipes, valves (size, function)	
	Road network, materials, drainage	



Figure 18. Controlled access at Anglesea

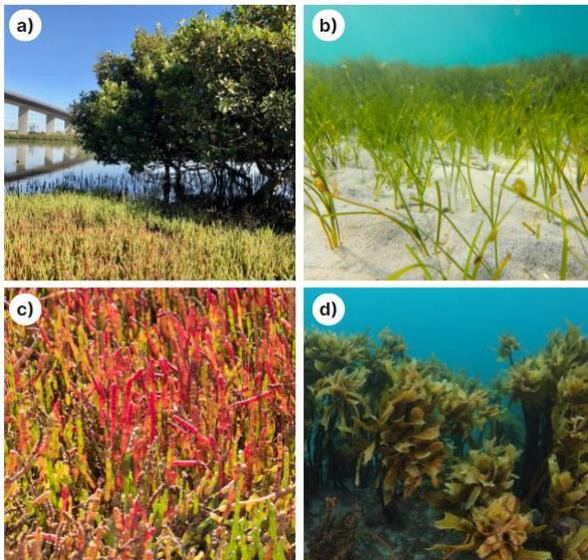


Figure 19. Restoration of blue carbon ecosystems: a) mangrove b) seagrass c) saltmarsh d) kelp



Figure 20. Rock revetment Skenes Creek

**What are resilient homes?**

Making changes to your home over time can reduce damage from future flooding and help you get back to normal quicker after a flood event.

Changes for a resilient home include:

-  Raise electrical power outlets above waist height to reduce damage during a flood and allow power to be restored more quickly
-  Look at different floor and wall covering options. Tiles and waterproof grout are much easier to clean after a flood than wallpaper or carpet
-  Raise TVs, speakers, Wi-Fi modems and other electricals above waist height or mount on walls if possible, to reduce damage during a flood
-  If fitting a new bathroom, think about a free-standing bath or shower that is easier to clean around after a flood rather than a fixed bath
-  Raise fridges, freezers, kitchen appliances and cupboards on plinths or stands with removable kickboards to reduce damage and make cleaning up easier
-  If replacing electrical appliances think about appliances which can be lifted or placed in higher locations such as a front-loading washing machine on a shelf or plinth instead of a top loader on the ground.
-  Metal or raised bed frames and other furniture will be easier to clean up than divan or upholstered furniture
-  Place work benches along the inside of garage walls to help reinforce the walls and reduce damage from floodwaters and strong winds

Figure 21. Resilient homes (resilient infrastructure materials and design)<sup>15</sup>

<sup>15</sup> Sunshine Coast Council – Coastal Hazard Adaptation Strategy (2021)

## Mainstreaming nature-based methods

Nature-based methods use the creation or restoration of coastal habitats for hazard risk reduction<sup>16</sup>.

This can be done through restoring the habitat alone (“soft” approach), or in combination with hard structures that support habitat establishment (“hybrid” approaches).

Nature-based adaptation in a coastal setting can include rehabilitation of existing degraded habitats, restoration of habitats that have been historically present or the creation of new habitats in ecologically suitable areas.

Nature-based methods contribute to coastal hazard risk reduction through ecosystem processes such as increased bed friction, local shallowing of water, sediment deposition and building of vertical biomass.

Benefits of using nature-based methods include their capacity to be adaptative to a changing climate, self-repair after storm events, and their co-benefits such as supporting biodiversity, fisheries productivity, water filtration and carbon storage. They also often provide a way to best retain the natural features and values of the coast, e.g. natural dune systems, sandy beaches, and marine ecosystems, while also reducing coastal hazard risk.

Nature-based approaches can also be combined with other risk reduction actions. As noted in the IPCC ‘*Special Report on the Ocean and Cryosphere in a Changing Climate*’ it is generally more effective if built-infrastructure adaptation is accompanied with nature-based approaches.

In recognition of the benefits of nature-based methods, there is an increasing focus globally on mainstreaming this approach to adaptation.



Ramblers reef Portarlington

**Nature-based methods** - the creation or restoration of coastal habitats for hazard risk reduction.

In accord with global and national best practice, the Victorian Marine and Coastal Policy (2020) recognises nature-based methods as the first strategic coastal hazard adaptation option after non-intervention and avoid. In practice, this requires land managers to consider:

- In what ways could I employ a nature-based approach?
- What nature-based actions could be included in my pathway?
- Could nature-based actions be undertaken for a period of time and/or trialled?
- Are hybrid nature-based methods feasible?
- Can I demonstrate that I have considered all nature-based possibilities in evaluating actions and building my adaptation pathway?

The National Centre for Coasts and Climate’s “Australian guide to nature-based methods for reducing risk from coastal hazards 2021” (<https://nespclimate.com.au>) provides a valuable resource for to improve awareness of nature-based methods in Australia and outlines key considerations for their implementation.

The Adaptation Actions Compendium in **Attachment B** provides additional information on a suite of nature-based methods across:

- Coastal wetlands/blue carbon ecosystems
- Dune ecosystems
- Hybrid actions.

<sup>16</sup> Morris RL, Bishop MJ, Boon P, Browne NK, Carley JT, Fest BJ, Fraser MW, Ghisalberti M, Kendrick GA, Konlechner TM, Lovelock CE, Lowe RJ, Rogers AA, Simpson V, Strain EMA, Van Rooijen AA, Waters E, Swearer SE. (2021) The Australian Guide

to Nature-Based Methods for Reducing Risk from Coastal Hazards. Earth Systems and Climate Change Hub Report No. 26. NESP Earth Systems and Climate Change Hub, Australia.

**Blue carbon**

Blue carbon is carbon sequestration (the removal of carbon dioxide from the earth’s atmosphere) by the world’s oceanic and coastal ecosystems. This occurs through plant growth and the accumulation and burial of organic matter in the soil.

Blue carbon ecosystems – including saltmarsh, mangrove forests, seagrasses – are natural and highly effective carbon sinks.

As a nature based coastal hazard adaptation approach - the root structure of blue-carbon ecosystems can also reduce wave energy and hold shorelines in place. This reduces the likelihood of exposure to coastal hazards including coastal erosion and inundation (Figure 22).

Globally, mangroves alone provide flood mitigation benefits that exceeds \$US65 billion per year, while their loss is associated with 15 million more people being flooded annually (Menéndez *et al.*, 2020).

Blue-carbon ecosystems also provide significant environmental, cultural, economic and social co-benefits.

A statewide assessment has been undertaken for Victoria (DELWP and Deakin University 2022) to provide spatial information on current and potential future blue carbon ecosystems along Victoria’s coast. This assessment identifies feasible areas for the restoration or expansion of blue carbon ecosystems, and the co-benefits to fisheries, water quality, and coastal hazard management.

This information will be available through [DELWP’s CoastKit portal](#) and can be used by coastal land managers to identify potential areas where the creation or restoration of blue carbon ecosystems may be a feasible coastal hazard adaptation option.

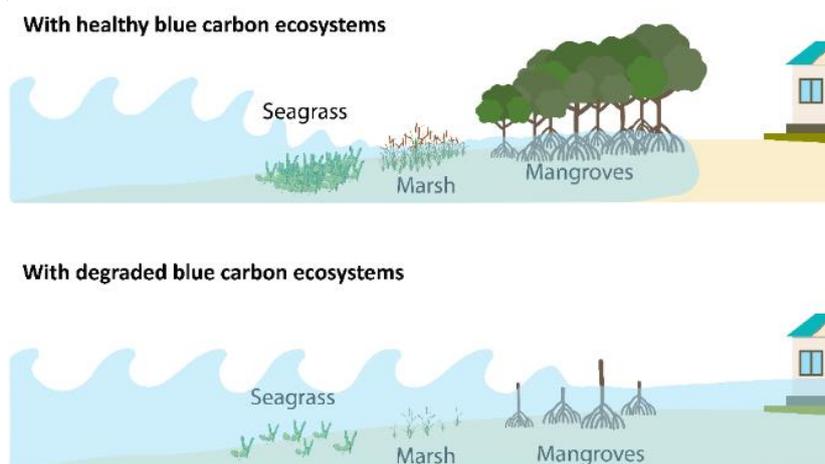
**Considering blue carbon opportunities in coastal hazard adaptation**

For coastal hazard adaptation planning in Victoria, land managers may wish to consider their blue carbon opportunities to inform strategic adaptation planning and actions.

An approach to considering blue carbon potential for coastal hazard adaptation at the local/site scale may include:

Description	Example
<p><b>1</b> Review blue carbon data available at national/state level to identify known opportunities through a first-pass assessment</p>	<p><a href="#">Coastkit</a></p>
<p><b>2</b> Undertake a tailored site-based assessment according to the desired spatial scale to identify specific opportunities and priority actions</p>	<p><a href="#">Blue carbon in Hobsons Bay City Council</a></p>
<p><b>3</b> Undertake detailed investigation and modelling to inform on-ground works for blue carbon protection / restoration, through a detailed and third-pass assessment.</p> <p>This includes field data collection at target sites.</p> <p>This is particularly important at sites where restoration actions may be complex, such as hydrological restoration/bund wall removal where a local scale hydrological model needs to be developed.</p> <p>In addition, local soil carbon data can also be collected to provide accurate predictions of blue carbon gains with restoration.</p>	<p><a href="#">Avalon Coastal Reserve (Victorian Coastal Wetland Restoration Program)</a></p>

Figure 22 - Example of the potential benefits of blue carbon ecosystems to prevent coastal hazards (e.g., storm tide inundation)



## 5.2 Develop a pathways outline

A useful first step towards creating an adaptation pathway is to develop an outline / template.

### Context

*Please review the Introduction section of this Victoria's Resilient Coast guideline for key foundational context on adaptation pathways.*

To reiterate some of the introductory context of this guideline (refer Table 4, Figure 5, Figure 6), in practice, a pathways approach provides a 'road map' for adaptation from present day to a long-term planning horizon (typically 2100). Using this approach enables:

- Long-term strategic planning
- Consideration of multiple potential futures and associated adaptation pathways, and preferred pathways consistent with Marine and Coastal Policy (2020) directions
- Avoidance of short term actions that may lead to maladaptation
- Confidence to take short term action to mitigate coastal hazard risk.

Adaptation pathways can be created at varying spatial scales including:

- Multiple sites/localities (typically a beach or local area) with detailed pathways of risk reduction actions
- Regional areas (e.g. sediment compartment or LGA) to demonstrate a higher level strategic approach.

A regional Coastal Hazard Adaptation and Resilience Plan (CHARP) will typically include a set of site scale adaptation pathways for priority areas, complemented by a higher level strategic pathway view.

### Approach

The approach to developing an adaptation pathway/s outline should enable project partners to:

- Confirm sites/spatial scales and the number of pathways being created
- Contribute to tailoring the focus of the pathways (areas, issues)
- Shape the format of the outputs to the project needs (figures/tables).

Creating an adaptation pathway outline involves:

- Setting up initial pathways template/s (tables/diagrams)
- Confirming key information on current and emerging hazard risk (from Stage 4)
- Considering initial feasibility of adaptation pathways in the context of known hazard risks and local values and adaptation objectives
- Consider all possible futures – ensure pathways enable transformational adaptation where applicable.

*The focus of creating a pathways outline is to consider all the possible pathways/futures that align with Victorian policy context, local and regional values, and project partner needs (Table 17, Figure 23), and opportunities for transformational adaptation.*

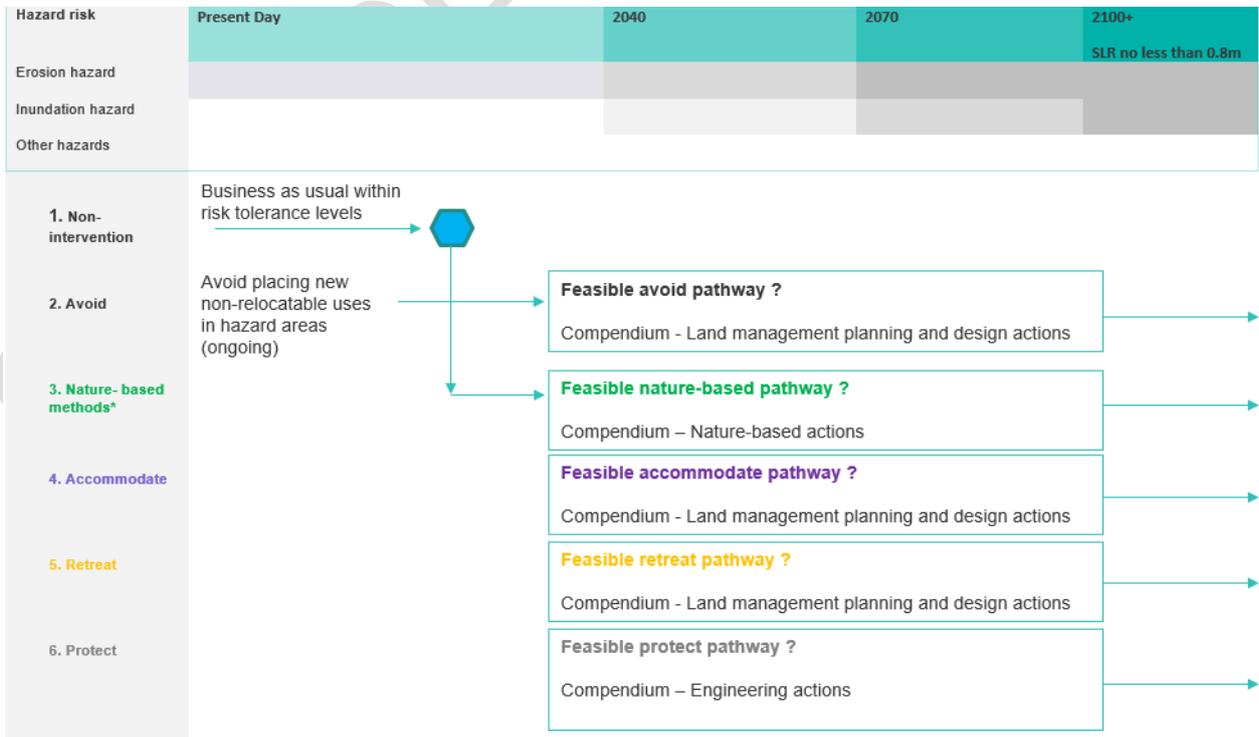
Potential concurrent pathways (e.g. avoid + nature-based + accommodate), and initial sequence and triggers for pathway changes can be noted. For example, triggers may include when the need to intervene may commence, when nature-based and accommodate pathways may commence, when planning for retreat may need to commence.

An initial screening of feasible adaptation actions for each pathways can also be identified, in preparation for further evaluation in Section 5.3.

Table 17. Adaptation pathways foundational questions

Strategic options order	Foundation questions for building an adaptation pathway	Associated functional types of adaptation actions
1. Non intervention	Is non-intervention appropriate?	For which hazards and risks? Where and for how long? What actions do we include? What would trigger a change?
2. Avoid	Can we continue to avoid the hazards?	
3. Nature-based methods	Can we pursue a nature-based approach?	
4. Accommodate	Can we better accommodate the hazards/risk?	
5. Retreat	Can we retreat from the hazards/risk?	
6. Protect (major engineering works)	Do we require a protect approach?	

Figure 23. Building a pathways outline – consider all feasible pathways and futures aligned to Victorian policy and local values and objectives



## 5.3 Assess and select actions

### Approach

The purpose of this step is to further evaluate and select actions that will be included in implementing adaptation pathways.

The approach includes to:

- Compile a shortlist of adaptation actions relevant to the feasible adaptation pathway (using the adaptation actions compendium – Attachment B)
- Use multi-criteria analysis to evaluate adaptation actions and guide consideration of the most appropriate actions for the adaptation pathways
- Use economic analysis to support decision making on appropriate actions and the sequence and timing of adaptation actions in the pathways.

### Multi-criteria analysis

Multi-criteria analysis is a decision tool that enables actions to be evaluated based on multiple criteria.

This process can assist with shortlisting and selecting adaptation actions.

Multi-criteria analysis is performed by screening each adaptation action through a range of qualitative or semiquantitative criteria. Weightings may also be applied to different criteria.

Criteria must be developed collaboratively with project partners, and reflect the values and objectives identified in Stage 2 of Victoria's Resilient Coast framework, as well as any additional considerations related to implementation.

Criteria may include:

- Confidence in hazard risk reduction
- Alignment with cultural, environmental, social values
- Victorian policy alignment
- Adaptive ability (enables future pathway changes)

- Co-benefits/outcomes
- Cost is feasible
- Approvals are feasible.

The outcomes of the multi-criteria analysis may include:

- Selection of a range of actions to be included in the adaptation pathways
- Identification of any actions where economic analysis is required to assist with decision making on action selection and sequencing and timing of actions.

### Economic analysis

Economics provides an additional tool to inform evaluation of adaptation options and strategic adaptation planning (Figure 24).

The extended guideline in **Attachment C** outlines a five-step best practice approach for economic evaluation to support coastal hazard adaptation.

- Step 1 – Scope the assessment: define the purpose, scope and scale of the work.
- Step 2 – Value the base case: Perform a quantitative assessment of risks to calculate average annual damage values
- Step 3 – Support actions analysis: Scope adaptation actions and quantify costs and benefits of adaptation
- Step 4 – Compare cost and benefits: Use discounted cash flow analysis to compare costs and benefits with sensitivity testing
- Step 5 – Communicate the results and make decisions: Present the draft results of the cost-benefit analysis and use them to make informed decisions.

The outcome of the economic analysis will include increased confidence on the selection of actions for the adaptation pathways, and the sequencing and timing of actions.

The economic analysis also assists to provide confidence in value for investment, and to highlight the economic benefits of adaptation and proactive planning.

Further detail on the role of economics in supporting coastal hazard risk management and adaptation, and the best practice approach for assessments, is provided in Attachment C.

## 5.4 Refine adaptation pathways

### Pathways and triggers

Following assessment and selection of adaptation actions, the adaptation pathways can be further detailed and refined.

Formats for adaptation pathway content, figures and diagrams vary widely, and are generally tailored to be fit for purpose.

Pathways may incorporate all functional types of actions in the one diagram (e.g. the sequence and timing of planning, nature based, engineering actions across pathways), or separate diagrams/considerations for each functional type.

Triggers for change from one pathway/action to another should be identified. Triggers for change in pathway/action may include:

- A change in the hazard risk level
- A hazard event (beyond predicted exposure)
- Action effectiveness
- The timing of other notable events (e.g. design life end for infrastructure)
- Updated values, vision and objectives.

Revising the initial pathway outline into a detailed adaptation pathway should be done in collaboration with project partners to ensure a fit-for-purpose output.

In addition to the detailed actions for individual pathways, the adaptation planning process may also often inspire consideration of broader actions that apply for all areas and can assist with improving adaptive capacity. These actions may include actions related to:

- Environmental programs
- Community collaborations
- Engagement and education programs
- Project partner organisations capacity building
- Other.

Actions associated with advancing broader actions can also be incorporated into adaptation plans and Stage 6 implementation.

### Key principles

Key principles to consider in refining adaptation pathways (content and output format) for Victoria include:

- Can the policy order of strategic options consideration be clearly demonstrated?
- Have all opportunities to incorporate nature-based adaptation actions been considered?
- Have all accommodate and retreat actions been considered prior to protect?
- Have the adaptation pathways been underpinned by a robust engagement process with all project partners and the community?

### Stage 5 summary report

The output of Stage 5 includes a concise summary report for project partners articulating:

- The work/process undertaken for this stage, including the engagement and communication process and who contributed
- A summary of the approach to the adaptation options and actions assessment, including the adaptation pathways, and results from supporting analysis
- Summary of key updates to the Project Plan during / at conclusion of Stage 5.

### Stage 5 checklist

Readiness to progress checklist	
Does the Stage 5 summary report have in principle support of the project partners? – noting iterative refinements may continue as the next Stages progress.	
Have preliminary adaptation pathways and broader actions been identified for all priority areas?	
Has the scope for Stages 3 - 6 been reviewed and updated in the Project Plan based on the work completed for Stage 5?	
Are all updates to the Project Plan supported by the project partners?	

## Stage 6 - Plan and implement

Stage		Across all
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	Collaborative process
Stage 4	Vulnerability and risk	
Stage 5	Adaptation actions and pathways	Engagement and communication
Stage 6	Plan and implement	
Stage 7	Ongoing monitoring and review	

This section provides an overview of:

- Stage purpose
- Engagement and communication
- Refine implementation plan
- Gain support and endorsement
- Review and finalise
- Final reporting
- Final checklist.

### Stage purpose

The purpose of Stage 6 is to confirm the plan of action for coastal hazard risk management and adaptation, and commence implementation.

This includes priority actions in the adaptation pathways, shared roles and responsibilities, triggers for review and resources/requirements.

### Engagement & communication

A tailored engagement and communication process should continue across Stage 6 as per the approach to creating a collaborative process (Stage 1.4) and activities detailed in the Project Plan.

Activities should include participatory approaches to enable a two-way flow of information. For Stage 6 this may include:

- Site visits, workshops, drop-in sessions, meetings, online sessions, including to support final input from project partners and the community on the draft plan, implementation priorities and opportunities
- Ongoing partnership discussions with Traditional Owners, including implementation needs/support
- Tailoring of key messaging for Stage 6 and for different audiences – e.g. to summarise outcomes of the adaptation planning process, including priority actions, seek final feedback and communicate outcomes. Example key messages are provided in Attachment F.

## 6.1 Refine implementation plan

In this final stage, a regional Coastal Hazard Adaptation and Resilience Plan (CHARP) or similar plan is developed that includes refinement of the adaptation pathways and triggers for change, and implementation details for actions.

This includes the following elements.

### Prioritising actions

Prioritisation of actions within and across multiple pathways should include consideration of:

- immediacy of coastal hazard impact
- magnitude of coastal hazard impact / magnitude of threat to values, including irreversibility
- lead-in time required for individual options
- flow-on impacts of damage to values (e.g. loss of single access to township, increasing vulnerability to other hazards such as bushfire)
- irreversibility of damage to values (e.g. loss of Traditional Owner sites of significance).

### Funding actions

Identify and plan for:

- cost of initial action
- ongoing maintenance cost of action for its lifecycle – including any decommissioning
- costs of offsetting impacts to values
- short, medium, and long-term source of funding
- cost-sharing arrangements
- avenues for alternate funding sources
- cost triggers for changing approach.

### Roles and responsibilities

Identify which organisation/s will:

- implement adaptation options
- monitor ongoing effectiveness and impacts of adaptation options
- replace / upgrade adaptation options

- initiate review of adaptation options
- deliver / support ongoing community engagement and education.

### Triggers for review

Identify triggers for review of the plan that may include changes in:

- Sea level rise benchmarks
- Policy contexts
- Project partners
- Other strategic plans
- Hazard risk updates
- Changes in vulnerability profiles.

### Change management

Change management refers to the methods taken in order to prepare, support and assist organisations to alter their internal and external processes.

A change management plan is important to support the organisational change required to implement transformational adaptation. Characteristics of effective change management plans include:

- Identifying and articulating the rationale and justification for change
- Ensure buy-in and support from senior management
- Establishes change champions throughout the organisation
- Participative management of the process – involve staff from across the organisation to contribute and characterise necessary changes
- Identify and initial “quick wins” to help build momentum.

### Monitoring, Evaluation, Reporting and Improvement Plan

A Monitoring, Evaluation, Reporting and Improvement (MERI) plan is required to ensure ongoing effectiveness of adaptation management.

Given the changing nature of climate change impacts, and the evolving understanding of physical processes and improvements to data and projections, adaptation planning needs to be responsive to new information as it becomes available.

Key components of an effective MERI plan include:

- A program logic that details the links between the adaptation actions and the objectives identified in Stage 2, and the assumptions underpinning the actions being taken.
- Measures of success that outline key performance indicators, and the baseline data from which performance is being measured.
- Roles and responsibilities for who will monitor and evaluate performance indicators, and how any necessary changes will be actioned.

## 6.2 Gain support and endorsement

### Endorsement and approvals

Endorsement and approvals of the draft and final adaptation plans should be sought as per the engagement and communication plan (Stage 1). This includes all partner agencies as well as organisations with implementation roles, and public consultation on the adaptation plan.

The collaborative engagement process established in Stage 1, and running through all stages of the framework, should ensure that engagement has underpinned the development of the draft plan, to provide a strong platform for final consultation and support.

### Public engagement

Local councils and land managers are well-placed to lead the engagement process for adaptation planning given their established processes, high visibility within the community, and the representative nature of local government.

Where multiple councils or land managers are involved, one council should lead the process – utilising their Community Engagement Policy made under the *Local Government Act 2020* - in collaboration with other project partner organisations.

As noted previously in Stage 1, all engagement with Traditional Owners must follow a self-determination approach.

All public engagement should follow the community engagement principles set out under the *Local Government Act 2020* of:

- Engagement processes have a clearly defined objective and scope
- Participants in engagement must have access to objective, relevant and timely information to inform their participation
- Participants in engagement must be representative of the persons and groups affected by the matter that is the subject of engagement
- Participants of engagement are informed of the ways in which the process will influence decision making

The public must have an opportunity, and sufficient time, to review and make submissions on the draft coastal hazard resilient and adaptation plan.

A minimum two-month public engagement process that invites submissions is required.

## 6.3 Review and finalise

Following close of public engagement and analysis of submissions, the final step is to prepare an engagement report that evaluates and documents the level of public engagement, and any recommended changes to the adaptation approach.

Understanding the level / success of engagement is an important metric in demonstrating legitimacy of the process and the outcomes.

The project partnership must endorse any amendments to the draft adaptation approach.

All project partners then seek their organisations' approval / support. For organisations with identified actions in the plan, senior approval is required (e.g. councillor), and for organisations in the project partnership with no direct actions, senior level support is required.

## Final reporting

The output of Stage 6 includes the final Coastal Hazard Adaptation and Resilience Plan (CHARP) or similar plan that documents:

- The work/process undertaken for coastal hazard risk management and adaptation planning, including the engagement and communication process and who contributed
- Adaptation pathways and priority actions across the study area, and associated implementation plan
- Handover and storage of all data.

## Final checklist

Readiness to progress checklist	
Does the final adaptation plan have in principle support of the project partners?	
Have all actions been assigned lead and partner agencies?	
Has all data been handed over to an agreed lead agency?	



Torquay

## Stage 7 – Ongoing monitoring and review

Stage		Across all
Stage 1	Scoping and preparation	Traditional Owner knowledge, rights and aspirations
Stage 2	Values, vision and objectives	
Stage 3	Coastal hazard exposure	
Stage 4	Vulnerability and risk	Collaborative process
Stage 5	Adaptation actions and pathways	Engagement and communication
Stage 6	Plan and implement	
Stage 7	Ongoing monitoring and review	

### Stage purpose

The purpose of Stage 7 is to ensure coastal hazard risk management and adaptation is accompanied by ongoing monitoring and evaluation process that enables effective implementation, learnings and improvement.

Monitoring and review should be undertaken as determined through the MERI plan and roles and responsibilities for project partners as defined in Stage 6.

## **Attachment A: Coastal hazard extended guideline**

Refer separate document.

CONFIDENTIAL - PILOT

## **Attachment B: Coastal hazard adaptation actions compendium**

Refer separate document.

CONFIDENTIAL - PILOT

## **Attachment C: Economics approach to inform adaptation**

Refer separate document.

CONFIDENTIAL - PILOT

## Attachment D: Framework comparisons

Coast Adapt	QLD	WA	NSW	NZ	VIC
	CHAS - Coastal Hazard Adaptation Strategy	CHRMAP - Coastal Hazard Risk Management and Adaptation Planning Guidelines	Coastal Management Plan (CMP) (hazard adaptation embedded)	Coastal hazards and climate change: guidance for local government	Victoria's Resilient Coast - Adapting for 2100+
<b>Identify challenges</b> Scoping & engagement planning	STAGE 1: Plan for life-of project stakeholder communication and engagement	STAGE 1: Establish the context - inc. scope, engagement	STAGE 1: Identify the scope (CMP)	STAGE 1: Preparation and context	<b>STAGE 1:</b> Scoping and preparation
	STAGE 2: Scope coastal hazard issues for the area of interest	STAGE 2: Risk identification - inc. hazard and asset mapping		STAGE 2: Hazard and sea-level rise assessments	
<b>Assess risks and vulnerabilities</b> Coastal hazard vulnerability & risk	STAGE 3: Identify areas exposed to current and future coastal hazards	STAGE 3: Vulnerability assessment - inc risk matrix	STAGE 2: Determine risks, vulnerabilities and opportunities	STAGE 3: Values and objectives	<b>STAGE 2:</b> Values, vision and objectives
	STAGE 4: Identify key assets potentially impacted			STAGE 4: Vulnerability and risk	<b>STAGE 3:</b> Coastal hazard exposure
	STAGE 5: Risk assessment of key assets in coastal hazard areas	STAGE 4: Risk evaluation - inc. existing controls			<b>STAGE 4:</b> Vulnerability and risk
<b>Identify options</b> Scope range of options	STAGE 6: Identify potential adaptation options	STAGE 5: Risk treatment - inc. options evaluation	STAGE 3: Identify and evaluate options	STAGE 5: Identify options and pathways	<b>STAGE 5:</b> Adaptation actions and pathways
<b>Evaluate options, prepare plan</b> Evaluate options, prepare strategy/plan	STAGE 7: Socio-economic appraisal of adaptation options	STAGE 6: Implementation plan	STAGE 4: Prepare, exhibit, finalise, certify and adopt	STAGE 6: Option evaluation	(inc. evaluation)
				STAGE 7: Adaptive planning strategy (with triggers)	(inc. adaptation pathways development)
				STAGE 8: Implementation plan	<b>STAGE 6:</b> Plan and implement (inc. implementation plan and MERI plan)
<b>Take action, monitor and evaluate</b> Implement and ongoing review	STAGE 8: Strategy development, implementation and review	STAGE 7: Monitor and review (monitoring plan)	STAGE 5: Implement, monitor, evaluate and report	STAGE 9: Monitor	<b>STAGE 7:</b> Ongoing monitoring and review
				STAGE 10: Review and adjust	
<b>Links</b>	<a href="#">Homepage – QCoast 2100</a>	<a href="#">GD CST coastal hazard risk management-guidelines-July2019 (dplh.wa.gov.au)</a>	<a href="#">Coastal management programs   NSW Environment, Energy and Science</a>	<a href="#">Coastal hazards and climate change: Guidance for local government   Ministry for the Environment</a>	<a href="#">Victoria's Resilient Coast – Adapting for 2100+ (marineandcoasts.vic.gov.au)</a>

# Attachment E: Guidance for developing an Engagement and Communication Plan

This guidance applies for a whole-project, as well as specifically for each individual Stage of *Victoria's Resilient Coast framework*.

UNDERSTAND	
<b>1. Define why you are engaging</b>	
<i>Understand the background and context</i>	<ul style="list-style-type: none"> <li>• Why is this project happening and why now?</li> <li>• What previous engagement has occurred in this location or on this issue?</li> <li>• What else is happening that might impact on the project outcomes (e.g. a related issue in the media)?</li> <li>• Who else is working in this area that will have information to assist you?</li> </ul>
<i>Write a purpose statement</i>	<ul style="list-style-type: none"> <li>• What do you want the engagement to achieve?</li> <li>• What are the questions you want your engagement to answer?</li> <li>• What opportunities are you exploring?</li> <li>• What decision will engagement outcomes inform?</li> <li>• Does the purpose statement reflect the needs of decision makers, stakeholders and community?</li> </ul>
<i>Create a list of engagement objectives</i>	<ul style="list-style-type: none"> <li>• Guide the development of your engagement process.</li> <li>• Objectives will also help measure the success of the project.</li> <li>• Objective examples include:               <ul style="list-style-type: none"> <li>– to inform development of the structure planning guidelines</li> <li>– to gain insight into relationships between key stakeholders</li> <li>– to improve community understanding of natural hazard planning</li> </ul> </li> </ul>
<b>2. Describe what people can and cannot influence in your project</b>	
<i>List the project 'negotiables'</i>	<ul style="list-style-type: none"> <li>• What can people change through their input into the engagement process?</li> </ul>
<i>List the project 'non-negotiables'</i>	<ul style="list-style-type: none"> <li>• What elements do people not have any opportunity to influence?</li> <li>• Is there any safety, technical or legislative requirements that cannot change?</li> <li>• Critically assess why it is that these elements can't be influenced and how you will communicate this</li> </ul>
<b>3. Understand who to involve</b>	
<i>Brainstorm with your team members and partners</i>	<ul style="list-style-type: none"> <li>• What key organisations, partners, advocacy groups and community members should take part?</li> <li>• Have you included the involvement of a wide range of voices?</li> <li>• Who has taken part in the past?</li> </ul>
<i>Classify which stakeholders will need the most attention</i>	<ul style="list-style-type: none"> <li>• Who will be most affected by your project?</li> <li>• Who might find it harder to take part?</li> </ul>

<p><i>Understand the motivations of key stakeholders</i></p>	<ul style="list-style-type: none"> <li>• Who is most passionate about the project?</li> <li>• How much influence do people have? (inform, consult, involve, collaborate, empower).</li> <li>• How have people reacted to past projects?</li> </ul>
<p><b>4. Identify resources, risks and sensitivities</b></p>	
<p><i>Think about how much time, money and support you have for engagement</i></p>	<ul style="list-style-type: none"> <li>• How much time can members of your project team give to the engagement process?</li> <li>• How much project budget do you have to spend on engagement resources (people and materials)?</li> <li>• Are there people outside your team that can support your engagement?</li> <li>• What existing partnerships and networks can you leverage?</li> <li>• Will you require independent or specialist expertise (e.g. facilitation, data analysis, etc)?</li> </ul>
<p><i>Conduct a simple risk assessment</i></p>	<ul style="list-style-type: none"> <li>• What are the potential risks to the project?</li> <li>• Are project timelines long enough to allow you to engage meaningfully?</li> <li>• What is the history of engagement on this project or in this place?</li> <li>• What are the known risks about the people and organisations you wish to engage?</li> <li>• What is the risk if you do not engage?</li> </ul> <p>Lack of trust in the project</p> <p>Engagement conversations dominated by ‘squeaky wheels’</p> <p>Online engagement methods don’t suit the audience</p> <p>Issues that are not part of the scope of the project dominate the conversation</p> <p>Communications invoke fear among the community</p> <p>Engagement fatigue</p> <p>Long term planning process results in loss of key infrastructure</p>
<p><b>IMPLEMENT</b></p>	
<p><b>5. Design your engagement approach</b></p>	
<p><i>Choose appropriate tools and techniques</i></p>	<p>When examining different tools ask:</p> <ul style="list-style-type: none"> <li>• Are you hoping to engage a lot of community, or go in-depth with a small group?</li> <li>• Which engagement techniques have been successful in the past?</li> <li>• Which tools and techniques will assist in achieving the objectives of engagement?</li> <li>• How will you ensure the engagement is inclusive and accessible to everyone?</li> <li>• What engagement skills do your team members have?</li> </ul>
<p><i>Write a delivery plan</i></p>	<p>Tips for planning:</p> <ul style="list-style-type: none"> <li>• Include key project milestones, engagement dates, resources needed and responsibilities.</li> <li>• Involve all team members in engagement planning.</li> <li>• Define your end date and work backwards from there when planning engagement timelines.</li> <li>• Have you considered how you will provide feedback to participants?</li> </ul>

<i>Develop your evaluation approach</i>	<ul style="list-style-type: none"> <li>Using the DELWP Engagement principles and your project engagement objectives, consider how you will track and assess the engagement.</li> <li>Include evaluation planning into your delivery plan.</li> <li>How will you collect information that will tell you if your engagement was successful or improvements could be made?</li> </ul>
<b>6. Create an engagement narrative</b>	
<i>Write key messages</i>	<ul style="list-style-type: none"> <li>What do you want people to know about your project?</li> <li>Why should people take part in your engagement process?</li> <li>Would your key messages make sense to a person on the street?</li> <li>Remember, each key message needs to be a stand-alone statement that communicates an important aspect of the project</li> </ul>
<b>7. Deliver engagement activities</b>	
<i>Follow a delivery checklist</i>	<ul style="list-style-type: none"> <li>Promote your engagement, utilise existing networks.</li> <li>Give participants plenty of notice, confirm dates, times and locations, write agendas and runsheets, prepare to facilitate, ensure you have the right people in the room to answer questions, know your venue and location</li> </ul>
<i>Capture all the engagement data</i>	<ul style="list-style-type: none"> <li>Ensure you capture the ideas, feedback and input of participants of all engagement activities.</li> <li>The data should be stored in a central location and is labelled to reflect the event and date it was captured</li> </ul>
<i>Track the engagement process</i>	<ul style="list-style-type: none"> <li>Is the engagement rolling out as planned?</li> <li>Are all key stakeholders and community members represented?</li> <li>What can you improve?</li> <li>Is it looking like the engagement objectives will be achieved?</li> </ul> <p>Tip: It is ok to change or adjust an activity or question if it is not working</p>
<b>8. Report engagement findings</b>	
<i>Write an engagement report</i>	<ul style="list-style-type: none"> <li>Your report should include an overview of the engagement process, information about engagement participants, an outline of engagement findings or outcomes and recommendations for next steps</li> </ul>
<b>9. Close the loop – We asked, You said, We did and Why</b>	
<i>Communicate engagement findings and outcomes to participants</i>	<ul style="list-style-type: none"> <li>How will you report engagement findings, share how feedback and input was and communicate further opportunities for people to get involved?</li> <li>Is there an engaging and visual way to present the information?</li> <li>Consider diverse needs, e.g. some participants will want a lot of information, some will want visual</li> </ul>
<b>EVALUATE</b>	
<b>10. Understand the success of your engagement</b>	
<i>Complete your evaluation and reflect on lessons learnt</i>	<ul style="list-style-type: none"> <li>What elements of engagement did you measure and collect data for?</li> <li>Was engagement delivered in line with DELWP engagement principles?</li> <li>Was engagement planned and delivered with efficient use of resources?</li> <li>Did engagement influence the decision or outcomes?</li> </ul>

# Attachment F:

## Example key messages for communications

### IN DEVELOPMENT (contributions invited)

Example key messages	Introduce from
<ul style="list-style-type: none"> <li>• Our Victorian coastal areas are diverse and dynamic, characterised by sandy beaches, rocky cliffs, bays and estuaries, coastal lakes and floodplains.</li> <li>• Coastal cultural landscapes have been nurtured by Traditional Owners of Country for countless generations.</li> <li>• The coast is dynamic and always changing, shaped by natural coastal processes such as erosion and inundation.</li> <li>• At times, natural processes may have a negative impact on coastal values and uses. When this occurs, we refer to the processes as coastal hazards.</li> <li>• Coastal hazard exposure occurs periodically across the coast and is projected to increase with changes in wave action, storm activity and sea level rise associated with climate change.</li> <li>• We are taking a partnership approach to managing coastal hazard risk and proactively adapt, both now and in the long-term (2100+).</li> <li>• Our approach is following directions of the Marine and Coastal Policy (2020) and the statewide guidelines to managing coastal hazard risk and adaptation.</li> <li>• As we progress this project, local knowledge will provide a foundation for confirming coastal values and objectives, coastal processes, and tailoring adaptation options.</li> </ul>	<p>Stage 2</p>
<ul style="list-style-type: none"> <li>• Coastal hazard information is currently publicly available at the state and national scale to assist communities and land managers with proactive planning.</li> </ul> <p>This includes inundation and sea level rise scenarios through Coastal Risk Australia, and Victorian assessments through CoastKit (<a href="http://marineandcoasts.vic.gov.au">marineandcoasts.vic.gov.au</a>).</p> <ul style="list-style-type: none"> <li>• The technical assessments completed for this project will assist to refine our understanding of coastal hazard exposure for our local area.</li> <li>• Coastal hazard assessments will be refined through local knowledge and data, and the best available science.</li> <li>• Coastal hazards are one of many natural hazards that can occur in areas we enjoy living in and visiting (e.g. bushfire, river flooding, air quality). Improved assessment and mapping of hazards enables us to create a plan to reduce the risk and adapt.</li> </ul>	<p>Stage 3</p>

Example key messages	Introduce from
<ul style="list-style-type: none"> <li>• Parts of our coastline may be more vulnerable to coastal hazards. We can identify vulnerable areas by assessing the hazard exposure, and ability of systems (cultural, social, environmental) to cope with, respond to and adapt to coastal hazards.</li> <li>• Identifying vulnerable areas enables us to be proactive in reducing vulnerability and risk.</li> <li>• Community values and objectives for different coastal areas provide the foundation for understanding vulnerability and risk.</li> </ul>	<p>Stage 4</p>
<ul style="list-style-type: none"> <li>• There are a range of ways we can manage coastal hazard risk and proactively adapt.</li> <li>• Different themes of actions include land management, planning and design, nature based methods, and engineering actions.</li> <li>• Our Victorian policy directions, alongside community values and objectives, provides the foundation for assessing options and developing adaptation pathways.</li> </ul>	<p>Stage 5</p>
<ul style="list-style-type: none"> <li>• Adaptation planning has been progressed through a partnership approach, and includes a suite of strategic adaptation actions.</li> <li>• This planning will assist us to proactively manage coastal hazard risk, both now and long-term (2100+).</li> <li>• Proactive adaptation will enable us to retain key values and uses of our coastal areas, and transition where we need to.</li> </ul>	<p>Stage 6</p>
<ul style="list-style-type: none"> <li>• An ongoing partnership approach with Traditional owners and local communities will provide a foundation for implementation.</li> </ul>	<p>Stage 7</p>

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Attachment F - Stages of the Cape to Cape Resilience Project, including purpose, key questions and outputs

Vic Resilient Coast framework stage	Purpose	Key questions	Cape to Cape Resilience Project deliverables and outputs
<b>Scoping and preparation</b>	Provide a foundation for commencing coastal hazard adaptation planning, aligned to leading practice.	<ul style="list-style-type: none"> <li>- Do we need action?</li> <li>- Who is involved?</li> <li>- Where's the study area?</li> <li>- What is our study scope?</li> </ul>	<p>Project plan</p> <p>Engagement plan</p>
<b>Values, vision and objectives</b>	Provide a foundation for adaptation planning that is based on regional and place-based values.	<ul style="list-style-type: none"> <li>- What do we value?</li> <li>- As a region and as a State?</li> <li>- What do we want the future to look like?</li> </ul>	<p>Community Values Study</p> <p>Cultural Values Study</p>
<b>Coastal hazard exposure</b>	Provide context, definitions and guidance on understanding coastal hazard exposure, and best practice guidance for progressing adaptation planning.	<ul style="list-style-type: none"> <li>- What processes are occurring and how might these change?</li> </ul>	<p>Coastal Hazard Assessment – All</p> <p>Coastal Hazard Assessment Exposure assessment</p>
<b>Vulnerability and risk</b>	Provide a foundation for exploring place-based coastal hazard vulnerability and risk, to enable strategic consideration of adaptation needs.	<ul style="list-style-type: none"> <li>- How might these processes impact what we value?</li> </ul>	<p>Coastal Risk and Vulnerability Assessment</p> <p>Economic Base Case</p>
<b>Adaptation options</b>	Identify, assess, consult on and decide which adaptation options and actions are the most appropriate for managing the current and future coastal hazard risks in the study area.	<ul style="list-style-type: none"> <li>- How can we manage and adapt to these impacts?</li> </ul>	<p>Adaptation option development</p>
<b>Plan and take action</b>	Confirm the adaptation pathways and a plan of action, including actions, shared responsibilities, and guidance to support implementation.	<ul style="list-style-type: none"> <li>- Which options are feasible and suitable, both now and in the future?</li> <li>- How can we plan our response strategically?</li> </ul>	<p>Economic assessment</p> <p>Adaptation feasibility modelling</p> <p>Cape to Cape Resilience Plan</p> <p>Implement actions</p>
<b>Ongoing monitoring and review</b>	Ensure adaptation is accompanied by ongoing monitoring and evaluation process that enables effective implementation, learnings and improvement	<ul style="list-style-type: none"> <li>- How can our response be adaptive to changing conditions?</li> <li>- How are we tracking in implementing our plan?</li> </ul>	<p>Cape to Cape Resilience Plan implementation, monitoring and evaluation</p>