

Coastal hazard assessments in Victoria



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Future Coasts program

4 year program established in 2007. Outputs included:

- **Coastal Digital Elevation Models**
- **Victorian Coastal Inundation Dataset**
- **Victorian Coastal Hazard Guide**
- **Coastal Asset Information Library**
- **Historic aerial imagery**
- **4 pilot (local) coastal hazard assessments**

Port Fairy: open coast with headland and river estuary

Bellarine Peninsula-Corio Bay: a large peninsula with open coast on one side and large embayment on the other

Western Port Bay: large shallow embayment

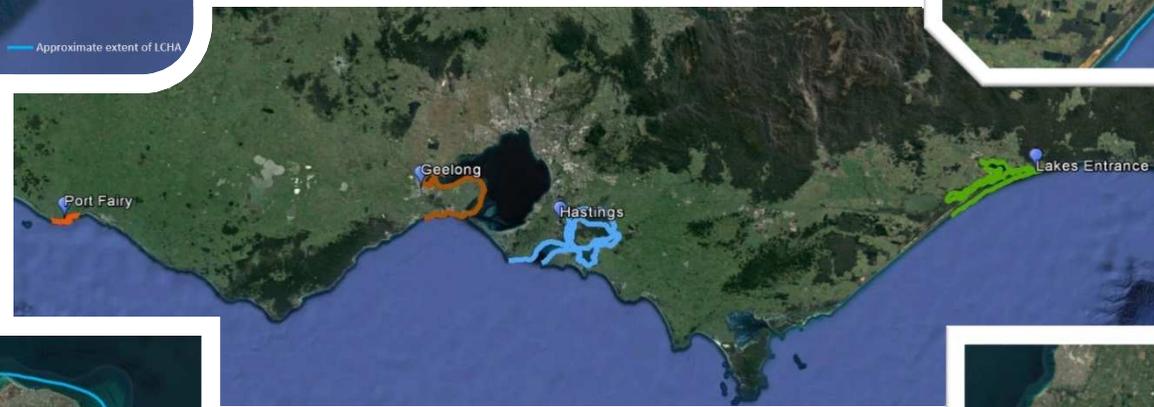
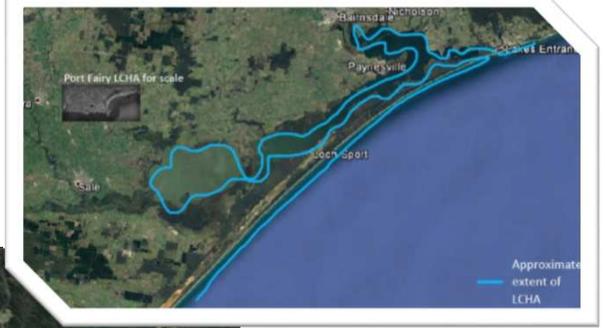
Gippsland Lakes/90 Mile Beach: long open coastal sand barrier protecting estuarine lake system

Location of pilot CHAs

Port Fairy



LE & 90 mile beach



Bellarine



Western Port





2 stage technical assessment

Each pilot CHAs used a basic two-stage methodology focused on inundation and erosion hazards.

Stage 1: data assimilation and gap analysis (i.e. desktop research) across the entire study area to collate all available information on relevant coastal and catchment processes for use in the coastal hazard assessment and identifying data gaps

Stage 2: detailed investigation of prioritised sites, including site visits, additional data collection and modelling work.

For both erosion and inundation, multiple coastal processes were considered - broadly defined into the following main components:

EROSION

1. short-term storm erosion; a) beach erosion, b) dune stability
2. shoreline recession: a) underlying recession, b) future recession
3. rocky cliff or bluff instability

INUNDATION

1. sea level rise
2. storm surge
3. coincident catchment flooding

All 4 pilots produced mapped and/or tabulated outputs that estimated:

- the landward extent of foreshore erosion for a present-day designated storm event, including the landward extent of any zone of reduced foundation capacity
- the extent of oceanic inundation at present, including storm surge computation, wave set-up, wave run-up and dune overtopping and, where relevant, flood extent from an adjacent estuary or catchment
- the impacts of future climate change, based on the time period for the study and the intervals for assessment
- consideration of uncertainty or safety factors based on the adequacy of available data and the existing knowledge of processes and effects

Different approaches

Due to the differing nature of the coastline and size of each project area, it was not logical for the 4 pilots to use similar project methodologies.

The varying availability of data, approaches chosen to fill data gaps, and local priorities in each project area, also led to different modelling approaches (differing hazard planning horizons, differing local dynamic forcings) and different applications being chosen for each area.

CHA	Inundation model	Erosion model	Hazard horizons	Stage 2 sites
Port Fairy	MIKE	SWAN, SBEACH	current, 2050 (0.4m SLR), 2080 (0.8), 2100 (1.2)	2
Bellarine Peninsula-Corio Bay	SOBEK	DHI LITPACK	current, 0.2m SLR, 0.5, 0.8, 1.1, 1.4	4
Western Port Bay	MIKE 21	MIKE 21	current, 0.2m SLR, 0.5, 0.8	4
Gippsland Lakes/90 Mile Beach	SOBEK	DHI LITPACK	current, 2040 (0.2m SLR), 2070 (0.4), 2100 (0.8)	5





Project governance / management approach

Governance approach – 3 tier:

- Project control/steering group (PCG): strategic/political guidance
- Technical reference group (TRG): subject matter expertise
- Project management team (PMT): operational

Project manager

- Port Fairy: DELWP Region/LGA
- Bellarine Peninsula-Corio Bay: LGA
- Western Port Bay: Melbourne Water
- Gippsland Lakes/90 Mile Beach: DELWP Region

Budget and scope

- Funding secured based on a high level funding application, then projects crafted to suit the budget.
- Would have preferred more detailed assessments during Stage 2.

2 stage tendering

- Allowed project scope to be amended.
- Except for the Westernport CHA, a different consultant was selected to complete each stage.

Community engagement

Port Fairy was the only pilot that undertook proactive community engagement activities.

Others thought that:

- content of CHA was not suitable for community engagement
- CHAs are a new form of assessment, there is lack of clarity about how the outputs of the pilots will be used for longer-term plans and actions
- once made aware of the project, the community would expect action to be taken
- project area too large to undertake meaningful engagement



Community engagement during a CHA makes sense as:

- awareness is increased not just of the CHA project, but also of the broader program of work on adaptation
- feedback is obtained on issues of concern to them
- engages the community in assessing their risk.

So when the program moves to planning and implementing adaptation responses, an already informed and engaged community is able to provide more targeted and meaningful inputs ...

- and may even feel empowered as individuals and communities to make changes themselves.





Where is the information now?

Pilot projects were all completed by about 2014, but it took several years before they were all made available to the public on the following websites.

Port Fairy: <https://www.pfcg.org.au/resources>

Bellarine: <http://www.ourcoast.org.au>

Westernport: <http://www.seccca.org.au>

Gippsland: <http://gcb.vic.gov.au>



Other website info

Port Fairy and Bellarine CHA websites also invite the public to become involved in further action.

Port Fairy website provides information about the community coastal hazards survey, and the on-going citizen science beach monitoring program.

Bellarine website provides a “coastal impacts solutions” tool that provides links to information to help land managers identify appropriate adaptation options.



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Involving the community to manage the Moyre River estuary and our coastline

Beach Monitoring Project

Beach monitoring is a major project for the Port Fairy Coastal Group. The monitoring provides valuable information to Moyre Shire Council and State Government Agencies for use in developing a response to erosion and predicted rises in sea level.

Every month we use a surveyor level to accurately measure beach profiles along km of East Beach, which illustrates what will happen if erosion and sea level rise go unaddressed. We seek the community's responses to questions about profiles and hearing the problem.

[Project details >](#)



PROJECTS

We are involved in projects ranging from measuring erosion, educating the community, taking feedback and working with the local council and government bodies to consider action.

[Find out more >](#)



GALLERY

Our collection of photographs reflect the diversity of views of our estuary and coastline.

This is a collection in progress.

[See the gallery >](#)

NEWS



Coynners Meet Feb-March 2019
March 26, 2019



Estuary News Letter

February 25, 2019



Flaunttime on the beach - have your way
February 4, 2019



Edgewood Festival Nature Day
February 4, 2019



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Coastal impact solutions

The Coastal Impact Solutions Tool is a readily available source for land managers to identify which appropriate adaptation options are available for their particular situation. It provides a list of options by the type of asset being impacted using the principles of Protect, Adapt/Accommodate, or Retreat by linking to local and international information and allows for additional information to be added. Although there are many options available, only those ones suitable to the relevant situation are provided.

Private

- Buildings & Land - Residential
- Buildings & Land - Commercial / Industrial

Public - Drainage

Public - Roads

Public - Utilities

Public Other

Environmental

Community & Public Open Space



Local govt led follow up projects

- Port Fairy Coastal and Structure Plan (draft report 2017)
- Port Fairy Climate Adaptation Plan (draft report 2018)
- Greater Geelong and Queenscliffe Flood Adaptation Effectiveness Study (2016)
- Greater Geelong and Queenscliffe Planning Schemes Implementation options (2018)
- Port Phillip Bay coastal planning - land use adaptation project: Development of Coastal Hazard Planning Guide, and preparation of baseline assessments of planning responses for 10 councils (will use info from Bellarine and Westernport projects and inform brief for PPB CHA). (in progress)
- Lakes Entrance Growth and Adaptation Strategy (in progress)



State govt led follow up projects

- Priority locations for detailed coastal hazard mapping and adaptation planning along the Victorian coastline (2015)
- Guidelines for Developing a Coastal Hazard Assessment (draft 2016)
- Local Coastal Hazard Assessment Learnings Project (2017)
- Victorian Coastal Hazard Assessment 2017: 2nd pass state-wide assessment of erosion and inundation hazards resulting from future climate change scenarios to inform the VCMP

Future CHA priority locations



MAP KEY - COASTAL COMPARTMENTS

- | | | | | | |
|-----------------|---------------------------|------------------------|---------------------------|-----------------------------------|---------------------|
| 1 Discovery Bay | 5 Great Ocean Road | 9 Port Phillip (mouth) | 13 Phillip Island (south) | 17 Wilsons Promontory (southwest) | 21 Snowy River |
| 2 Portland Bay | 6 Torquay | 10 Nepean Peninsula | 14 Powlett River | 18 Wilsons Promontory (east) | 22 Cann River |
| 3 Warrnambool | 7 Port Phillip Bay (west) | 11 Cairns Bay | 15 Venus Bay | 19 Corner Inlet | 23 Mallecoota Inlet |
| 4 Port Campbell | 8 Port Phillip Bay (east) | 12 Western Port | 16 Waratah Bay | 20 Gippsland Lakes | |

Barwon South West

Port Phillip Bay



Other State govt led follow up

Victorian Coastal Monitoring Program (VCMP): started in 2017 to set up long term monitoring, data collection, storage and retrieval.

Statewide Coastal Programs team: established in late 2017 to coordinate the statewide delivery of coastal programs, including policy and planning integration, business case development, technical standards and advice, and engagement co-ordination. One task is to develop a database of coastal protection assets and coastal assets.



Did CHA program meet its objectives?

Pilot CHA program objectives

- increase awareness and build capacity of coastal land managers/practitioners to assess and understand the relationship between climate change impacts and coastal hazards
- develop and test coastal hazard assessment methodologies for representative coastal landform systems in Victoria
- develop datasets which will facilitate/inform improved and more consistent coastal planning and management practices

Program was ambitious. Aim holistic, but outputs not specifically defined. This led to a fragmented approach.



Conclusions (1)

- The scope of each project had to be modified to match the limited project budget.
 - Coastal inundation better understood than coastal erosion issues.
 - Inadequate correlation between inundation and erosion.
 - CHAs are very complex and may need consortium approach or multiple contracts.
 - Terminology currently used is complex and not being consistently applied.
 - Some concepts aren't easy for practitioners to understand or assimilate; so how does the coastal practitioner community present all this to the public in a way that can be adequately comprehended?
- What's the difference between a coastal compartment / unit / cell? Geomorphic and sediment?
 - How are exposure, sensitivity and adaptive capacity defined, and then evaluated to provide a vulnerability rating?
 - What's the difference between - region / zone; significance / value, etc?



Conclusions (2)

There is not enough definitive guidance from state government how technical information developed during CHAs should be applied.

- How does an LGA “plan for SLR of 0.8m by 2100”?
- Outputs of Future Coasts program (including CHAs) available for 5+ years, but only a few councils have updated flood planning controls to consider coastal flooding and SLR. No erosion controls have been updated.
- Coastal erosion and coastal flooding affect each other: No conclusion whether a combined coastal flood and erosion overlay should apply or whether separate flood and erosion overlays should apply.
- Better guidance needed on what an adaption plan should contain, or how to prepare strategic planning documents for long term adaptation, that consider transitioning communities that will be impacted by SLR.

Conclusions (3)

We've made a good start on the journey, but there are still many blockers of actions rather than enablers.

There is still a generic fear of using information from CHAs because not only is it complex, it is also not consistently derived and developed, and is not well understood.



Questions? Comments!

