



Legislative Council Environment and Planning Committee

Inquiry: Inquiry into Climate Resilience

Hearing Date: 23 October 2024

Question[s] taken on notice

Directed to: Victorian Marine and Coastal

Council **Received Date:** 18 November 2024

1. **The CHAIR, page 17**

Question Asked:

Yes, just on that, we had evidence from the Borough of Queenscliffe before that there were some changes that they proposed to put through the planning scheme that ultimately were not introduced because of resistance from members of the community. That obviously presents a degree of difficulty. How do we bring the community along with the kind of adaptation changes that may affect how they enjoy the coastal communities, and what do we need to do to bring communities with us on this journey?

Jacquie WHITE: That is a great question, and one that VMAACC has been considering for some time around how do we normalise the conversation about climate risk and climate hazards on the coast. I think as Martin from the borough talked about, it is wrapped up in people's feelings about the coast. It is wrapped up in how we remember our association with the coast but also how we live and work and play along the coast now, so that change is hard because – I think his word was 'it's emotional'. So no-one wants to tap into that. It is tricky.

There is also work that VMAACC has been doing around a longitudinal study around people's attitudes towards the coast – and we are happy to provide that information as well – in terms of what is important, and it is often not what you think. It is about having access to nature and open space and that value that that provides.?

Response: The Victorian Marine and Coastal Council (and previously the Victorian Coastal Council) has undertaken longitudinal social research into what Victorians most value about the state's marine and coastal environments, and how they like to use them.

Importantly, the research explores what and how different kinds of activities pose a threat to these environments, as well as attitudes towards key challenges including climate change, population growth and coastal development.

The most recent report (Wave 5) can be found here:

https://www.marineandcoasts.vic.gov.au/_data/assets/pdf_file/0029/438329/Final-Report-Wave-5-Victorian-Marine-and-Coastal-Attitudes-Research.pdf?_gl=1*6thzb6*_ga*MzQxMTk1NTk2LjE2ODQ4MTczMjk.*_ga_7B9B3RBPPR*MTczMTY1MjkyNi4yMTAuMS4xNzMxNjUzMTA5LjYwLjAuMA..

Previous reports (Wave 1-4) can be found here:

https://www.marineandcoasts.vic.gov.au/home/victorian-coastal-council/publications-and-resources?_gl=1*1i7h9lx*_ga*MzQxMTk1NTk2LjE2ODQ4MTczMjk.*_ga_7B9B3RBPPR*MTczMTY1MjkyNi4yMTAuMS4xNzMxNjUyOTI5LjU3LjAuMA

2. **David ETTERSHANK, page 18**

Question Asked:

Look, I think with all these things it is sometimes hard for people to get a grip on exactly what it means in real life, so I would like to throw up a scenario, if I may. In the south of my region we have got Werribee, we have the Ramsar wetlands, we have some of the fastest growing suburban corridors and we also have some critical infrastructure, such as the sewerage works. I guess I would be interested if you could just describe for the many viewers and the committee what your modelling would suggest about the impact on that region, and what would that look like in terms of resilience and mitigation measures potentially?

Jacquie WHITE: Yes, great. Tom, do you want to jump into that first?

Tom KOMPAS: Yes. We can drill down to specific areas within a region. I mean, we do have the data for that. The infrastructure loss in your area was especially disturbing to me, but there are damages across the whole spectrum of land use classifications near Werribee. So if you wanted to, we could actually drill down a bit and see what specifically is going to be impacted. We have got that information. Keep in mind too that the original inundation layers out of the department of environment, although they are crackerjack – they are really good – have an estimate of a sea level rise of 0.82 in 2100, and that is the work that we did on that basis. But that is probably very conservative. It is seen as conservative. CSIRO says 1.1. Climate risk up in Sydney says a 1.5-metre increase in 2100. So those numbers you are looking at and the potential damages you are trying to drill down on are probably underestimates, unfortunately.

David ETTERSHANK: If there is an offer there to provide more elaboration, could I perhaps ask you to take that on notice and come back with that as maybe a bit of a case study. Would that be suitable?

Jacquie WHITE: Absolutely. Yes, we can do that...

David ETTERSHANK: Perhaps I could just ask you if you could elaborate a little bit on that in what you are taking on notice.

Jacquie WHITE: In terms of the case study? Absolutely, understood.

Response:

Werribee is nicely highlighted across aggregated land use categories on pages 27-24 of the technical report “Economic Impacts from Sea Level Rise and Storm Surge in Victoria, Australia over the 21st century by Kompas, T. et al (2022)”. The report can be found at the link below:

https://www.marineandcoastalcouncil.vic.gov.au/_data/assets/pdf_file/0030/665652/a1420184d6623d94a7f338f861671b6c68af15d5.pdf

The Victorian Marine and Coastal Council (VMaCC) is currently considering commissioning a few case studies across Victoria, to support greater understanding of the Kompas Report, and support translation of the modelling into local planning and decision-making. The question posed during the Inquiry Hearing highlighted the value of providing some more practical examples of the Kompas report at a local scale, looking at the changes in impact with different resilience and mitigation measures. VMaCC would be happy to keep the Inquiry updated on how these case studies are progressing, and when they are published.

3. **Melina BATH, page 19**

Question Asked:

Yes, I think to my mind the Inverloch Surf Life Saving Club and Inverloch surf beach are very much the canary at the moment – they are right out there on the sticky end. I am just really interested to understand, and can you just refer to that: in legislation all of those six adaptation options must be considered. Is that correct?

Jacquie WHITE: In that order, so working through that order as a hierarchy.

Melina BATH: Yes. But how do you address options? I want to understand – and maybe you can take it on notice – the difference between ‘accommodate’, because ‘accommodate’ could also have protective elements in it –

Jacquie WHITE: Yes.

Response:

The best way to respond to this question is to look at the Victorian State Government's *Marine and Coastal Policy 2020*; the six adaptation options are clearly defined and outlined on page 37:

Examples of adaptation actions in order of consideration

Adaptation actions will have different levels of effectiveness, efficiency and consequences based on local circumstances. These actions are not mutually exclusive, and a pathway approach will likely result in multiple options being used over time.

- 1. Non-intervention:** Allow marine and coastal processes, and the hazards they may pose, to occur. Non-intervention might be chosen as an appropriate action in a number of circumstances, including when the hazard poses an acceptable level of risk to values or uses, when intervention would cause unacceptable negative impacts, or when intervention would be ineffective or not cost-effective.
- 2. Avoid:** Locate new uses, development and redevelopment away from areas that are or will be negatively impacted by coastal hazards. This also needs to consider the type of use or development and if it's appropriate for the location. For example, a hospital or a piece of critical power infrastructure would have much lower tolerance to hazard risk compared to a temporary or easily moveable use or development, and would need to avoid higher risk areas. Avoidance can also help natural systems adapt by avoiding development where it would impede the movement of habitats and species, or decrease their resilience to the effects of climate change.
- 3. Nature-based methods:** The resilience of existing and new uses and development may be improved by enhancing or restoring natural features to mitigate coastal hazard risk. Restoring native vegetation to lessen the impact of erosion on dune systems would be an example of such action. Adaptation for natural systems could also include preserving and restoring corridors to allow for the landward migration of habitats and species. Nature-based methods tend to have more co-benefits than other adaptation actions, in that they can restore and enhance biodiversity values, improving resilience of vulnerable coastal ecosystems and also often improving amenity.

- 4. Accommodate:** Structures can be designed to reduce the exposure to, or decrease the impact of, coastal hazard risk, thus 'accommodating' the risk. Examples of this could include building lifesaving towers that can be rapidly and easily moved to respond to an eroding shoreline, or using building design techniques that reduce the impact of flooding. Accommodate options can be useful to improve resilience and 'buy more time' before further actions are necessary.

- 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. Determining the timing of retreat is a strategic and localised decision that needs to be planned for proactively. If relocating, care must be taken not to move structures to sites where they will face other potential hazards.

Retreat of natural systems may also be required; for example, saltmarsh habitat that would naturally migrate landward in response to sea level rise may be obstructed by the built environment, and corridors of undeveloped land may be required to allow landward movement of species and functioning habitats.

- 6. Protect:** Existing physical barriers are enhanced, or new ones constructed, to mitigate the impact of coastal hazards caused by marine and coastal processes. An example would be the enhancement or construction of sea walls to protect strategically important values from sea-level rise and storm surge. 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.

Despite the inherent problems, a point in time will be reached for many areas with existing development where either retreat or protect options will be the most effective and appropriate adaptation action. The timing of these actions will differ across Victoria.

Source:

https://www.marineandcoasts.vic.gov.au/_data/assets/pdf_file/0027/456534/Marine-and-Coastal-Policy_Full.pdf

4. **Gaelle BROAD, page 23**

Question Asked:

Can you give an example of a few local projects that have been effective at adapting?

Jacque WHITE: Yes. If you are looking at the nature-based examples, there is a huge investment that the City of Greater Geelong have made in really leading the way in trialling different adaptation options and looking at nature-based defence as a way of protecting against the erosion that was happening on particular beaches. I will not speak to that in detail, but I will be happy to get you that information. They have done a lot of work in trying to put that practice in place and test a range of different materials and a range of different options and partnering with a lot of their academic colleagues as well to do that to make sure it is done in a robust way so that we can measure and report on the effectiveness.

Tom KOMPAS: We have a recent paper on natural barriers that has been published that we could provide as well. As Jacquie said earlier, there are a number of our colleagues at Melbourne Uni who work on this. One point to note, though, is that natural barriers are typically effective only at relatively small sea level rise layers – you know, after 0.6 or up to 0.8 the natural barriers do not really work very well, so you have to do other things.

Jacque WHITE: We can provide you that paper, yes.

Response:

Please see the paper attached via email:

Assessing the coastal protection services of natural mangrove forests and artificial rock revetments. Strain E.M.A *et al* (2022)

Link to paper:

<https://www.sciencedirect.com/science/article/abs/pii/S2212041622000250?via%3Dihub>

A blueprint for overcoming barriers to the use of nature-based coastal protection in Australia. Morris, R. *et al* (2024)

Link to paper: <https://doi.org/10.3389/fenvs.2024.1435833>

5. **Gaelle BROAD, page 23-24**

Question Asked:

Aside from that project, are there any other sorts of practical projects that you would highlight?

Jacquie WHITE: There are. There are plenty of things happening across the state. I think it is tricky to do. They range from things like planning decisions through to actions in the water, so to pick one, I think, would be a challenging thing to do. I am happy to provide something that gives you a snapshot of the different things happening along the coast – I think that would be a better way of doing it to show you the breadth of different things that are being trialled and worked on and perhaps to get a sense of the land managers who are leading that work as well. I think that is interesting – the different scales of organisations in the sector who are working on it and leading the way. Would it be okay to take that on notice and give you a more comprehensive answer, rather than just picking one at the exclusion of some really good stuff that is happening?

Gaelle BROAD: That would be great. Thank you.

Response:

The VMaCC recently held the 2024 Marine and Coastal Awards, showcasing the diversity of work being done across the state in planning, managing and engaging communities. A full list of the finalists is provided in the 2024 Awards Booklet (attached). The award finalists demonstrate the breath of innovative, leading-edge examples across Victoria:

- Leadership in Climate Adaptation and Resilience – with examples of climate adaptation planning by South Gippsland Shire and Mornington Peninsula Shire
- Excellence in Marine and Coastal Design / Development – nature-based climate adaptation at The Dell Eco-Reef, Geelong City Council
- Inspiring Community Engagement and Education – helping to grow the conversation about marine and coastal climate impacts and adaptation in local communities, with youth and the recreational fishers.

Previous awards winners can be viewed [here](#), showcasing further examples of climate adaptation and resilience across Victoria.