



Turning the tide...

Climate change, overfishing, pollution, sedimentation, habitat destruction – all have taken their toll on the Hauraki Gulf. However, a recent Marine Protection Act looks to turn this destructive tide to help restore the Gulf's health. To find out how, see the article beginning on page 3.

The Noises islands viewed at sunset from Waiheke Island (Photo: Public domain).



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Word from the Chair

Kia ora koutou,

Coastal work in Aotearoa is rarely simple. It sits at the intersection of natural processes, infrastructure, biodiversity, mātauranga, community values, policy, and long-term change. This issue of *Coastal News* reflects that complexity well: from new marine protections in the Hauraki Gulf/Tikapa Moana, to deeper reef ecosystems, through to practical planning tools for communities facing coastal change.

What stands out is the need to keep connecting good science, engineering, policy and planning with real decisions on the ground. We all know and love the dynamic nature of the coast, a lived environment where ecological, cultural, social and economic values intersect. That complexity is exactly where the New Zealand Coastal Society has an important role to play.

As a Society, our strength has always been our multidisciplinary community. Our members work across research, consulting, councils, central government, iwi partnerships, education, engineering and planning. *Coastal News* continues to showcase that applied knowledge: not as isolated pieces of work, but as part of a wider conversation about how we manage, adapt to, and care for the coast.



Over recent months, the NZCS Management Committee has also been reflecting on the Society's future direction and relevance. A clear theme is emerging: NZCS should continue to be a trusted, independent forum for coastal professionals, while also being more proactive in sharing knowledge, connecting people, and helping shape conversations that matter for Aotearoa's coastal future.

Thank you to all contributors to this issue, and to those who continue to support NZCS through articles, regional updates, events, scholarships, partnerships, and quiet volunteer effort. Please keep sharing your work, your questions and your ideas. The strength of NZCS comes from the community behind it.

Ngā mihi nui

Ana Serrano and Connon Andrews
NZ Coastal Society Co-Chairs

About the NZCS

The New Zealand Coastal Society was inaugurated in 1992 'to promote and advance sustainable management of the coastal environment'. The society provides a forum for those with a genuine interest in the coastal zone to communicate amongst themselves and with the public. The society's mission is to take a leading role in facilitating robust discussion and nationally-coordinated interactions to better manage and learn about our coastal and marine environment.

NZCS members represent a wide range of coastal science, engineering, management and planning disciplines. They are employed in the engineering and environmental consulting sectors, in local, regional, and central government, in research institutes, in the tertiary education sector, and in schools.

NZCS is a technical group of Engineering New Zealand. The multi-disciplinary nature of coastal management in New Zealand means many of our members are from areas other than engineering. There are no entry criteria for the society and we welcome membership enquiries from anyone with an interest in the coast. Information on membership categories can be found at <http://www.coastalsociety.org.nz/membership/about-membership>

Membership applications can be submitted on the NZCS website, or alternatively can be sent to the NZCS Administrator Renée Coutts at: nzcoastalsociety@gmail.com

Marine protections strengthened in the Hauraki Gulf

Hannah Zwalue¹

The Hauraki Gulf/Tikapa Moana Marine Protection Act 2025 (hereby referred to as the Act) is Aotearoa New Zealand's most significant increase in marine protection in over a decade.

The Hauraki Gulf is a taonga that is on a path of recovery. It has been doing it tough for many years as increasing impacts of climate change, overfishing, pollution and sediment runoff have taken their toll. Years of reporting indicate kina barrens are increasing, key habitats like seagrass meadows are disappearing, and localised fish and shellfish stocks are struggling to simply sustain themselves. Our local marine species are under pressure.

The Act is one of a variety of tools in the kete that we're using to help turn the tide. This new law focuses on a variety of unique habitats where marine life breeds and grows. The new network of protected areas safeguards rare and important habitats and ecosystems – the kinds acting as nurseries for young fish – to help rebuild fish size, abundance and variety over time. It protects these environments from human pressures like fishing, waste dumping and extraction. The goal? To restore the mauri (life force) of the Gulf and build stronger, more resilient ecosystems for generations to come.

History

The Act came into effect late last year, on the 25th of October 2025. However, this network of protected areas builds on the aspirations of the Sea Change Tai Timu Tai Pari plan, incorporating feedback from tangata whenua, stakeholders and the public. The Act includes both pre-existing and new marine protection tools.

The new law has introduced 12 new high protection areas (HPA), five new seafloor protection areas (SPA), and two marine reserve extensions.

In a high protection area, the goal is to protect and restore marine ecosystems, while

allowing active restoration and authorised customary fishing practices. This means that you *can* swim, snorkel, kayak and anchor your boat, but you *can't* fish (commercial or recreational), take seafood, discharge waste, or disturb habitats by underwater construction or drilling.

In a seafloor protection area, the goal is to protect important seafloor habitats from high-impact activities. This means that you *can* swim, snorkel, kayak and carefully anchor your boat, recreationally line fish, spearfish, surfcast, use a pot, and gather by hand – as long as you don't damage the seafloor – but you *can't* bottom trawl, dredge, Danish seine, sand mine, drill, or dump waste. A few extra rules apply to the SPA around the Mokohinau Islands – no set netting, potting and bottom longlining.

To complement this, the two marine reserves that have been extended are Te Whanganui-o-Hei/Cathedral Cove in the Coromandel and Cape Rodney-Okakari Point (Goat Island/Te Hawere ā Maki) in Auckland. This is because research showed that keystone species (such as crayfish and snapper) were travelling beyond the boundaries of the reserve, often being caught through fishing on the edge of the reserves. This extension is designed to better protect them throughout their life stages.

There are limited exceptions regarding commercial fishing in two of the 12 HPAs: Rangitoto and Motutapu HPA, and Kawau HPA. Specific small-scale, authorised commercial fishing operators are allowed to conduct ring-net operations. They can only fish from 1st March to 31 August, and only target kahawai, trevally and/or grey mullet. The area they can fish in represents 3% of the total protected area under the Act. This will be reviewed after three years.

Authorised customary fishing can take place in High Protection Areas. This recognises and supports Māori customary knowledge, learning, and kaitiakitanga (guardianship) of the marine environment, as well as acknowledging the cultural value of Tikapa Moana, Te Moananui-a-Toi. Customary

fishing is not new; it is already authorised and regulated under Fisheries legislation. Customary non-commercial rights are guaranteed under Te Tiriti o Waitangi and are managed under the Fisheries Act 1990.

Customary fishing can only happen within an HPA if they have got written approval from a tangata kaitiaki/tiaki, which is a local guardian who manages customary fishing within their rohe moana (area). The fishing can only be for a customary purpose, such as a hui (meeting) or tangi (funeral). It's worth noting tangata whenua have been strong advocates for Tikapa Moana/Te Moanaui-o-Toi. They have laid rahui (temporary restrictions), backed up by fisheries closures, in areas where shellfish are struggling. They have taken action to restore shellfish beds, including depositing green-lipped mussels in the Mahurangi Harbour and pāua around Waiheke Island. They have been invested in fighting the invasive Caulerpa seaweed which smothers species beneath it. The small amount of customary fishing occurring in the Gulf isn't expected to affect the conservation goals of the HPAs.

We know that in marine reserves around Aotearoa, we see more types of fish and other marine life, often in larger numbers and larger sizes. This then creates a spillover effect into the surrounding waters. The areas that are now protected under the Act are some of the most biodiverse areas of the Hauraki Gulf, including nearshore areas and deep reefs. Some of the ecosystems that are now protected are chosen because they meet the criteria of being at-risk/being rare/having a large range of diverse wildlife/representing an important habitat type. Specific examples are given for a handful of HPAs below.

Tiritiri Matangi

This area was chosen as it is a land to sea linkage with the adjacent island sanctuary. The marine environment has high biodiversity values and a range of physical habitats, from microscopic planktons to horse mussel beds, jewel anemone to rhodolith

¹ Community Ranger (Marine), Auckland Marine District, Department of Conservation

(coral-like algae) beds. The sandstone shoreline leads to rocky reefs that fringe the coast and provide habitat for juvenile snapper, and in deeper areas you'll find kelp, sponges and reef fish. This also supports more pelagic species such as juvenile common thresher sharks, great white sharks, juvenile smooth hammerhead sharks, and bronze whaler sharks.

The Noises

This area is a marine conservation hotspot, and a significant seabird breeding site. The environment present here is very unique and regionally significant as there is a complex interconnected system of biogenic habitats (including kelp forests) across a relatively small area. These include shallow sponge gardens, dog cockle beds and rhodolith (a kind of red algae) beds. These beds in particular are ecologically important for the whole of the Hauraki Gulf, as they help filter massive amounts of seawater alongside providing shelter and food sources for a healthy functioning ocean.

Slipper Island

This area includes rocky reefs, sheltered bays and large fields of seagrass. There are at least 13 different habitats included in the waters of this HPA ranging from exposed rocky reefs to the east of Slipper Island/Whakahau through to sheltered rocky shores to the west.

Most importantly, Slipper Island is home to one of the last and possibly the best seagrass meadows, which is crucially important to the marine ecosystem. Seagrass meadows support a very diverse range of species including juvenile snapper/tāmure. Other species include horse mussels/hururoa, scallops/tipa, rock lobster/kōura and tuatua as well as sponges and soft corals. The southern boundary provides for protection of the reef system with a sand buffer between the reef and the HPA boundary.

More information, such as the specific reasons behind other marine protected areas, can be found on the DOC website.

How is DOC managing these areas?

We've hired a team which includes marine protection rangers, who are undertaking patrols of these protected areas around the clock. Our community (engagement) team is heading out to events, boat clubs, marinas and boat ramps, engaging with boaties

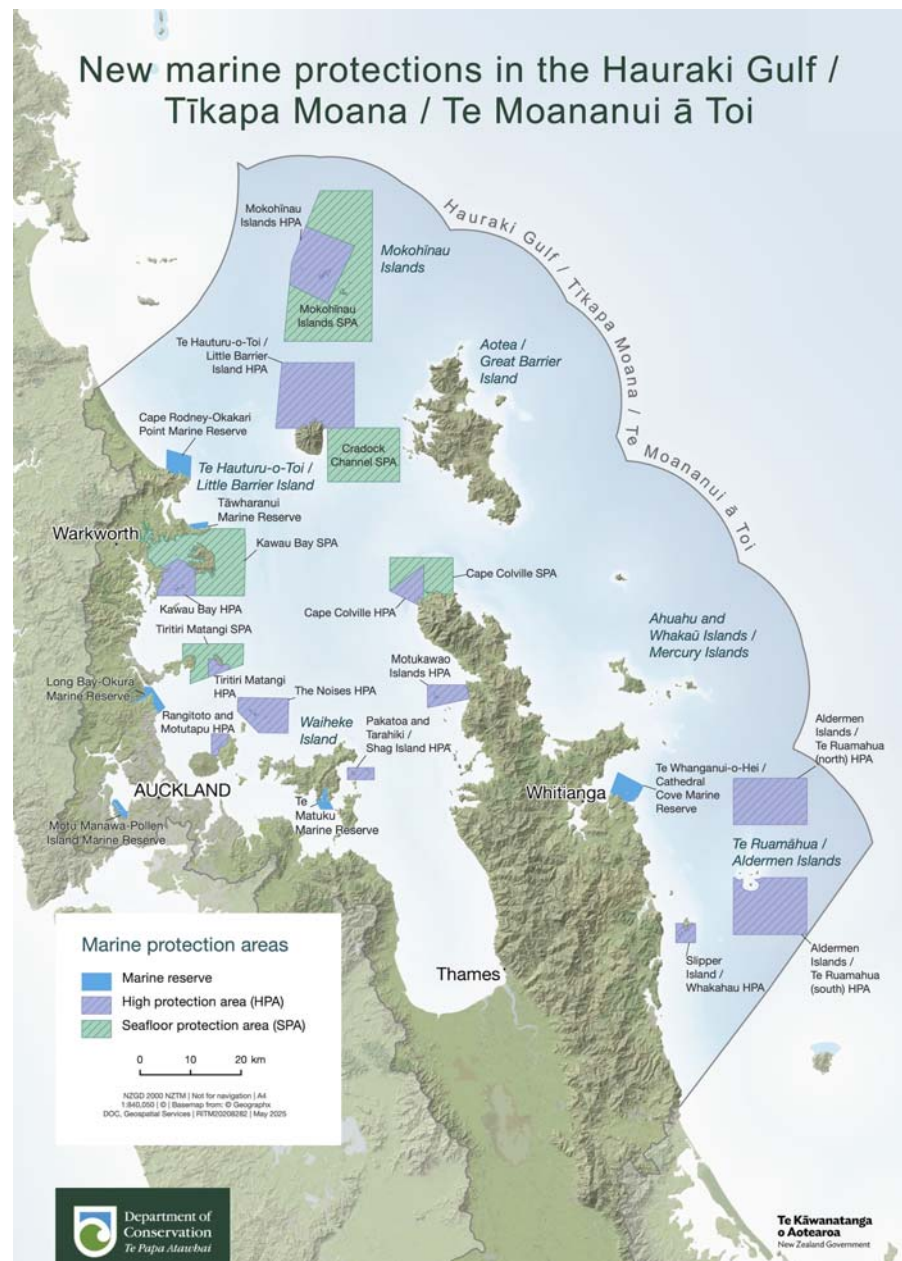
wherever we can. We've installed signage at boat ramps and entry points, distributed protection area maps to local businesses, and supplied digital maps to chartplotter providers to update their systems. The installation of more signs and marker buoys will continue to roll out. DOC's compliance work will gradually build to support the education focus. This will include on-the-water patrols, drones and high-zoom CCTV cameras to monitor activity in these protection areas.

For more information, head to <https://www.doc.govt.nz/haurakigulfmarinepark>. We recommend downloading the free app MarineMate that shows all the protected areas and your current location, which is a great tool for using on the water. Contact

revitalisingthegulf@doc.govt.nz for any further questions, or 0800 DOC HOT for any immediate compliance incidents or wildlife response.



DOC marine protection rangers Shelley Ogle and Olivia Christie aboard the Kaitiaki Motu on patrol around Tiritiri Matangi (Photo: DOC).



Deeper ocean ecosystems are unique – and uniquely vulnerable without better protection

James J Bell¹ and Manon Broadribb²

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New Zealand's earlier efforts to safeguard marine or coastal environments, particularly as marine reserves¹ and marine protected areas, typically focused on shallow ecosystems, largely because that is where most data exists.

But following the passing of the Hauraki Gulf Marine Protection Act² last year, it was good to see many deep rocky reefs among the 12 new high protection areas (HPAs).

These areas prohibit recreational and commercial fishing while allowing certain customary practices in ways that reduce or eliminate extractive activities, helping ecosystems recover and rebuild.

This is important because deeper reefs often host protected species and this recognises the need to protect these habitats³.

As our new research⁴ shows, even just 50 metres of depth can separate entirely different marine communities.

In this study at the Poor Knights Islands Marine Reserve off northeastern Aotearoa New Zealand, we examined sponge assemblages – a major component of temperate rocky reefs – from 5 to 65 metres in depth.

Sponges play an important role in filtering water, recycling nutrients and creating habitat for other organisms. They are also sensitive to environmental change, including marine heatwaves⁵.

Reefs do not simply continue unchanged with greater depth. In fact, deeper communities in the “mesophotic” zone, typically found at 30–150 metres of depth,

can host very distinct species that never occur in the shallows.

If conservation efforts don't recognise this, we may be leaving a significant portion of marine biodiversity unprotected.

Different communities at depth

Our results were striking. Sponge assemblages were strongly structured by depth.

Most species were depth specialists, found either in shallow reefs less than 30 metres deep or in deeper mesophotic zones, but not both.

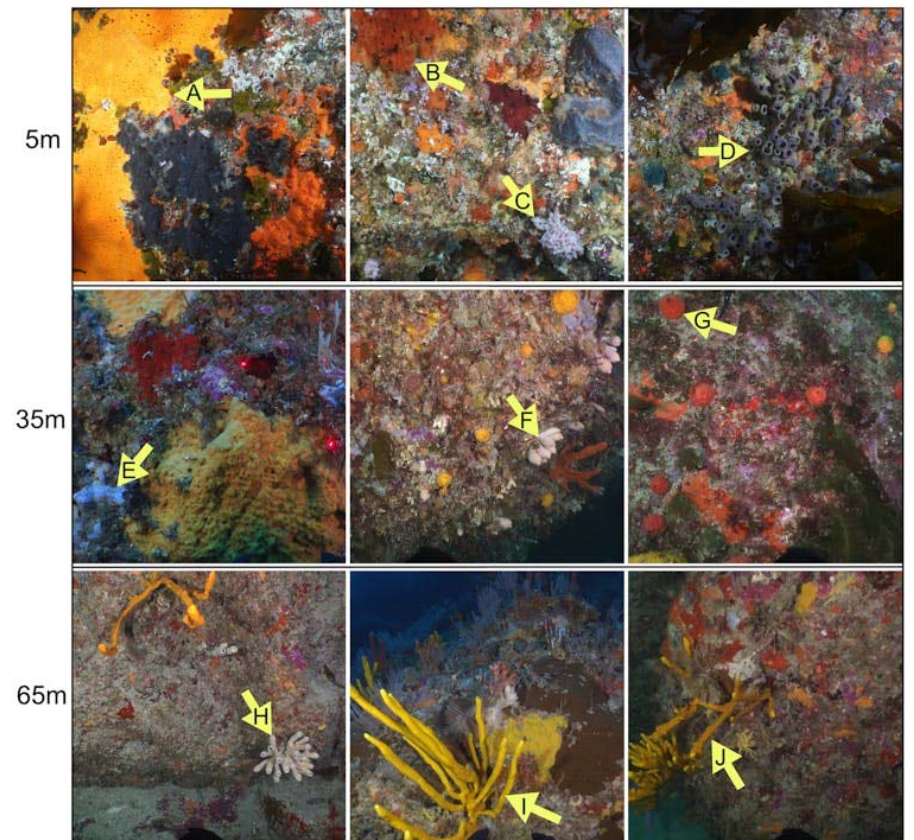
Across all sites we surveyed, we identified 64 sponge species or operational taxonomic

units. Only 18 occurred across multiple depths spanning both shallow and mesophotic zones. In other words, less than a third of species had distributions broad enough to potentially link the two zones.

Differences between depths were driven mainly by species replacement, not by shallow communities simply becoming poorer versions of deeper ones. This means mesophotic reefs are not just extensions of shallow reefs. They are ecologically distinct systems.

Are deep reefs climate refuges?

For years, scientists have debated whether deeper reefs might serve as refuges during



Shallow depths tend to support sponge assemblages dominated by encrusting and low-lying species such as those shown in the images from A to D, while upper mesophotic depths are dominated by species with mounding, tubular and golf ball forms (E to G). Meanwhile, middle mesophotic depths host assemblages made up of many branching sponges (H-J). James Bell (CC BY-NC-ND; <https://creativecommons.org/licenses/by-nc-nd/4.0/>).

¹ Professor of Marine Biology, Te Herenga Waka – Victoria University of Wellington

² Postdoctoral Researcher in Marine Science, Te Herenga Waka – Victoria University of Wellington

disturbances such as marine heatwaves, which can disproportionately affect shallower ecosystems.

The idea, known as the deep reef refugia hypothesis⁶, suggests deeper populations could survive warming events and later reseed damaged shallow reefs.

There is some evidence this can occur for certain species. In our study, a small subset of depth generalist sponges occurred consistently across both zones. These species may have the potential to benefit if deeper habitats avoid disturbances that impact shallower waters.

But our findings suggest this refuge effect may apply only to a minority of species. Most sponges had narrow depth ranges. If shallow populations decline, deeper reefs will not automatically act as a backup for entire assemblages.

This challenges the common assumption that deeper reefs can safeguard shallow biodiversity at an ecosystem level.

Why this matters

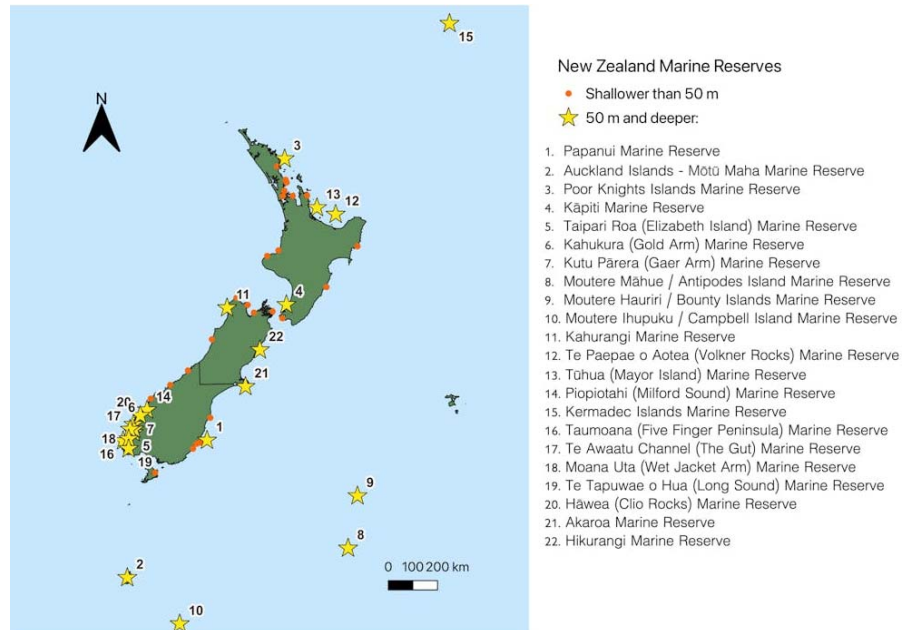
Marine protected areas in shallow, accessible habitats are easier to survey, monitor and manage. But biodiversity does not stop at 30 metres.

If deeper reefs host distinct communities, then protecting only the shallows leaves much of that biodiversity exposed to fishing pressure and other anthropogenic impacts.

Our assessment of the current network of 44 marine reserves in New Zealand shows the majority contain areas of rocky reef, but only half have reefs below 50 metres.

Importantly, these include New Zealand's larger offshore reserves (the Kermadec Islands, Auckland Islands, Bounty Islands, Campbell Island and Antipodes Island), which means the total protected area deeper than 50 metres comes to an impressive 16,294 square kilometres (about the size of the Auckland region).

However, these offshore marine reserves extend far deeper than the mesophotic zone and only a fraction of this area is rocky reef. When discounting the larger offshore reserves, the total area covered by marine reserves deeper than 50 metres is only 394



Distribution of all New Zealand marine reserves. Yellow stars indicate marine reserves containing seabed at depths of 50 metres or greater (mesophotic zone), and orange circles indicate reserves shallower than 50 metres. Bathymetric data from GEMCO global gridded bathymetry dataset; marine reserve boundary data from Land Information New Zealand (CC BY-NC-ND; <https://creativecommons.org/licenses/by-nc-nd/4.0/>).

square kilometres, less than 1% of New Zealand's territorial seas.

This has direct implications for marine spatial planning in Aotearoa New Zealand and globally.

Our research suggests ensuring the protection of both deep and shallow areas in the same geographical regions is essential if we want to safeguard the full spectrum of reef biodiversity. Protecting shallow reefs alone will not automatically protect deeper mesophotic species or vice versa.

Mesophotic reefs are often out of sight and out of mind. They lie beyond most recreational diving depths and are less studied than their shallow counterparts. Yet they can host rich sponge assemblages and other invertebrate communities that contribute significantly to ecosystem functioning.

They are also not immune to change. Ocean warming, shifting currents and sedimentation can all influence deeper habitats. While depth may buffer some disturbances, it does not guarantee protection.

Our findings add to a growing body of evidence that temperate mesophotic

ecosystems should be managed as distinct ecological entities. They are not simply deeper versions of shallow reefs, nor are they universal refuges.

As climate change intensifies and marine heatwaves become more frequent, conservation planning must consider how biodiversity is structured across depth. This means designing protected areas that encompass entire reef profiles, from the surface to the limits of light penetration.

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- 2 <https://www.doc.govt.nz/our-work/revitalising-the-gulf/new-marine-protections-in-the-hauraki-gulf/>
- 3 <https://theconversation.com/reefs-in-the-middle-light-zone-along-nzs-coast-are-biodiversity-hotspots-many-are-home-to-protected-species-254597>
- 4 <https://nsojournals.onlinelibrary.wiley.com/doi/10.1002/ecog.08250>
- 5 <https://theconversation.com/loss-decay-and-bleaching-why-sponges-may-be-the-canary-in-the-coal-mine-for-impacts-of-marine-heatwaves-194146>
- 6 <https://link.springer.com/article/10.1007/s00338-009-0581-x>

The lower Taiari catchment as a national test case for coastal climate change adaptation

Shane Orchard^{1,2}, Chris Kavazos³, Paulette Tamati-Elliffe⁴, Tūmai Cassidy⁴ and Korako Edwards⁵

Rising sea levels driven by global warming are threatening many coastal environments and communities. Along with risks for urban areas, infrastructure and productive land, the potential impacts on natural environments and resources may be severe. Their fate is often interlinked with infrastructure due to interactions between dynamic coastal features and the operational lifetimes of coastal defences. Many of Aotearoa's coastal and lowland ecosystems are already degraded from historical development patterns and climate change further complicates the conservation and restoration of these systems where space is often a limiting factor.

Te Mana o Taiari Matatū ki te Taiao

To address these challenges the national Ngā Awa programme led by the Department of Conservation Te Papa Atawhai is building climate resilience at the scale of river catchments in partnership with manawhenua, councils and community (Clearwater et al., 2024). It is applying a ki uta ki tai (mountains-to-sea) approach to land-water relationships and opportunities (Crow et al., 2020; Department of Conservation, 2025). In this article we report on Te Mana o Taiari Matatū ki te Taiao, a climate resilience strategy for the Taiari River catchment in the Ōtākou/Otago region. Sea-level rise (SLR) is one of the major concerns in the lower catchment where large tracts of land (>10,000 ha) lie close to sea level. There is a need to simultaneously address risks to cultural and ecological values, productive farmland, residential areas and major infrastructure including Dunedin International Airport. Concerns for Te Rūnaka o Ōtākou as manawhenua of the lower Taiari include potential ecosystem shift of freshwater wetlands, impacts on mahika kai resources (for example inaka, tuna and harakeke), changes to wāhi tūpuna. The pā

site of Ōtākou Rūnaka ancestor Tukiauaui is located within Te Nohoaka o Tukiauaui (The Sinclair Wetlands) between lakes Waipōuri and Waihora (Waihora). Depending on the adaptation methods adopted, sea-level rise could degrade manawhenua connection to these ancestral lands and waterways.

Te Mana o Taiari Matatū ki te Taiao is a living strategy that is being developed in a series of stages (Figure 1). Following establishment in 2020, initial visioning and stock-take exercises were undertaken to promote a common understanding of key issues among stakeholders and identify information sources and knowledge gaps that are important to the understanding of climate vulnerabilities (Department of Conservation, 2020; Orchard, 2022a). Ōtākou Rūnaka also initiated Te Nukuroa o Matamata, a \$5 million restoration project funded by Mahi mō te Taiao (Jobs for Nature) that engaged local kaimahi and rakatahi in delivering restoration activities in the Waihora and Waipōuri catchments (Department of Conservation, 2023). Alongside land-on restoration activities, kaimahi from Te Nukuroa o Matamata collaborated with Te Mana o Taiari to undertake salinity monitoring at culturally significant sites in the Waipōuri-Waihora wetland complex (Orchard, 2022b). Other information since then has included a LiDAR survey to help understand the impacts of SLR and baseline surveys of kanakana (lamprey) and giant kōkopu habitats. Climate-specific work includes a study of climate trends and risks in the catchment (Goldsmith, 2023), a workshop to identify key indicators for tracking environmental change and potential impacts (Orchard, 2023), and an investigation of the vulnerability of freshwater ecosystems (Closs et al., 2024). This climate risk and vulnerability information is helping to identify the location and potential severity of climate impacts on different components of the social-ecological system of the lower Taiari.

Whakatauirā tauari: Scenario modelling

In recent work we are using scenario models to inform community discussions on options

for SLR adaptation in the lower catchment. The scenarios help to visualise possible futures that could occur naturally or be directed by adaptation strategies and decisions on infrastructure (Figure 2). We used both static (bathtub) scenario models at fixed elevations, and NIWA's 100-year return period (ARI100) Extreme flood models (Stephens & Paulik, 2023) to investigate different perspectives on the vulnerability of natural ecosystems and land uses to SLR. Comparisons between the scenarios also provide a touchstone for understanding the progression of effects and timelines for adaptation actions. To support these applications we used an incremental relative sea-level approach in the range (0-200 cm) that can be matched with evolving projections for global warming and SLR that reflect uncertainties in greenhouse gas emissions and feedback loops such as the melting of glaciers (IPCC, 2023).

As an initial assessment of the potential impact of coastal squeeze on the >900 ha of freshwater wetlands in the area we developed spatial models based on the vertical elevation range they occupy. At their lower limit this reflects a combination of water depth and salinity regimes and the upper limit the effects of flood defences and natural topography. Although channel reworking under SLR will influence the evolution of intertidal areas, these scenarios based on current topography provide a useful first approximation of the available space for natural ecosystems as SLR progresses. They could also be used to explore different options for the maintenance and future configuration of flood defences that will influence the space that is available.

The scenario models show that nearly 10,000 ha of land is potentially vulnerable to coastal inundation under both extreme flood and normal tidal range conditions with only a small increase in relative sea level. Most of this land area is currently occupied by high producing grassland and supporting infrastructure for farming. Nearly all of the current freshwater or brackish wetland and lake ecosystems on the lower floodplain are

1 University of Canterbury Te Whare Wānanga o Waitaha

2 Waterlink Ltd

3 Department of Conservation

4 Te Rūnaka o Ōtākou

5 Kāti Huirapa Rūnaka ki Puketeraki

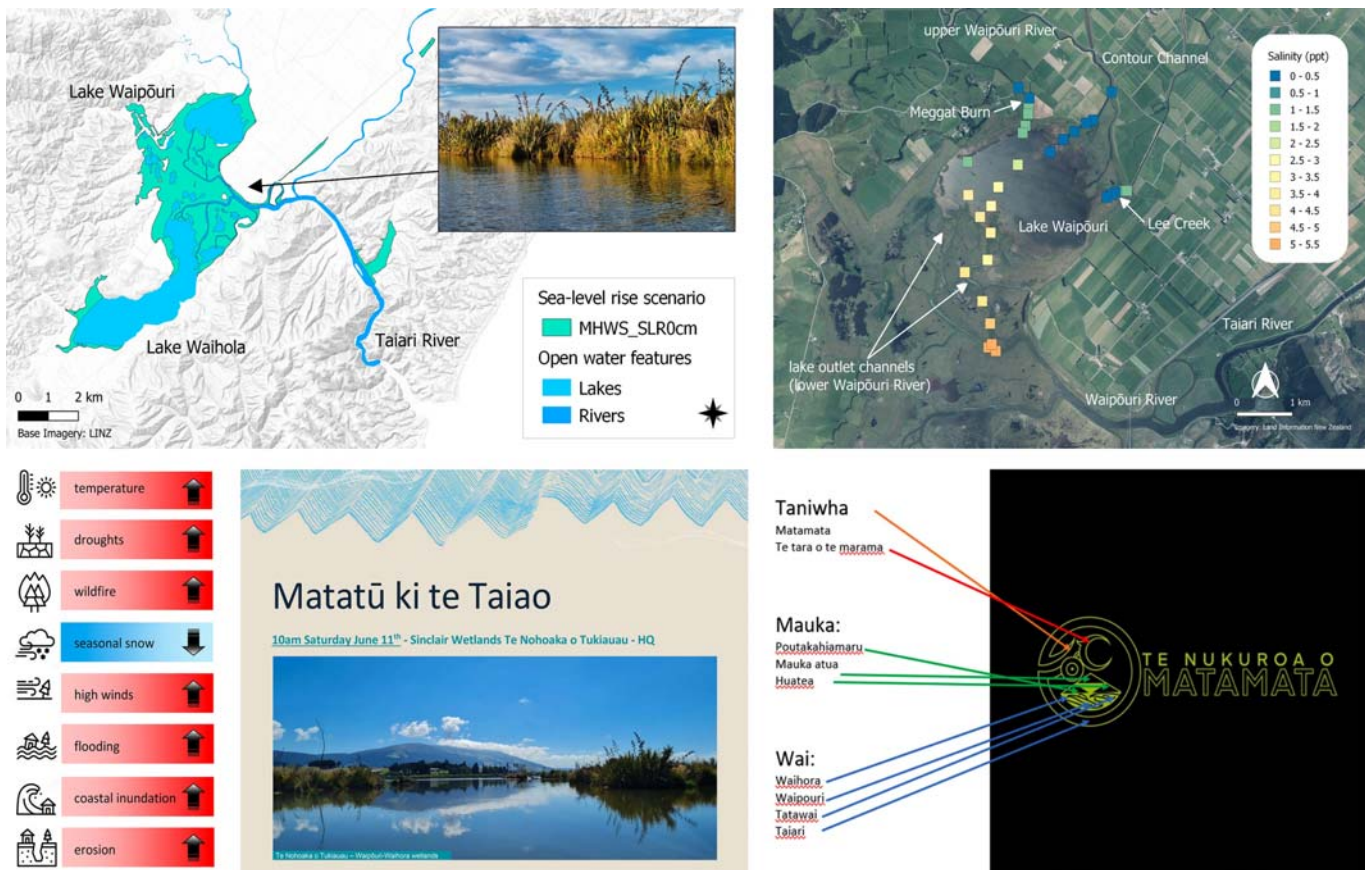


Figure 1: Components of Te Mana o Taiari Matatū ki te Taiao with a focus on adaptation to sea-level rise in the lower catchment. Clockwise from top left: Baseline scenario for the Lake Waipōuri-Waihola wetland complex at the elevation of Mean High Water Springs (MHWS) in the contemporary (2021) landscape. Example of saltwater intrusion into Lake Waipōuri on a spring tide with low river flows. Infographic of major climate risk factors and their projected trends in the wider Taiari catchment. Matatū ki te Taiao climate resilience workshops have been a regular feature of the programme. Central pou of Te Nukuroa o Matamata, a rūnaka-led restoration programme for the lower Taiari catchment¹ (Graphic courtesy of Te Rūnaka o Otākou).

also affected. Relative sea level increases of only ~1 m could displace nearly all of the existing freshwater wetlands in the absence of inland migration: yet most of this natural connectivity is actively defended by the existing embankment system. Solving this conundrum underpins the development of nature-based solutions that generally rely on land-use transitions potentially assisted by staged approaches to restoring natural floodplain connectivity in strategic locations. The overall pattern shows that agricultural land and the adjacent wetland and open water habitats are among the highest priorities for adaptation planning.

Upcoming work in the programme includes further refining these scenarios in participatory work with the community to provide more detailed information on the vulnerability of specific areas and values. Additional linkages and interdependencies

arising from upper catchment influences have yet to be incorporated within scenario models for the lower catchment and include effects from river flow regimes, land erosion and sediment transport. These connections illustrate that a ki uta ki tai approach is essential at the whole catchment scale while more local 'ridge to reef' perspectives can help to support decisions on the appropriate mix of productive and natural land uses across the interface between moana and whenua.

Matatū ki te Taiao – working with nature to find solutions

The lower Taiari catchment exemplifies the need to find climate solutions that are culturally appropriate, equitable and practical. The nature-based solutions concept offers a potentially useful framing by assisting communities to consider all parts of linked social, cultural, economic and ecological systems. Decision support tools such as

scenario modelling can further assist by drawing attention to a range of potential futures. Ultimately, these approaches might improve outcomes by helping communities to compare their strategic options while identifying and resolving undesirable trade-offs.

Spatial planning initiatives that are developed through scenario-modelling exercises are one of the most promising practical approaches. They might also look to use of eco-engineering techniques to deliver planned transitions between productive land uses and natural ecosystems in a predictable and optimised manner. Planning tools such as the Dynamic Adaptive Pathway Planning (DAPP) approach that is recommended in coastal hazards guidance could also incorporate this same information (Lawrence et al., 2019; Ministry for the Environment, 2024).

Matatū ki te Taiao relies on collaborative processes and relationship-building to

1 <http://www.otakourunaka.co.nz/te-nukuroa-o-matamata>

develop innovative approaches to climate resilience. While the sheer scale of affected areas and need for holistic solutions create a national test case for SLR adaptation it is hoped that the programme can inform similar challenges in many other coastal communities.

Kā mihi: Acknowledgements

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ākau toitu Kaitiakitaka (Ridge to Reef) programme, grant No. UOWX2206.

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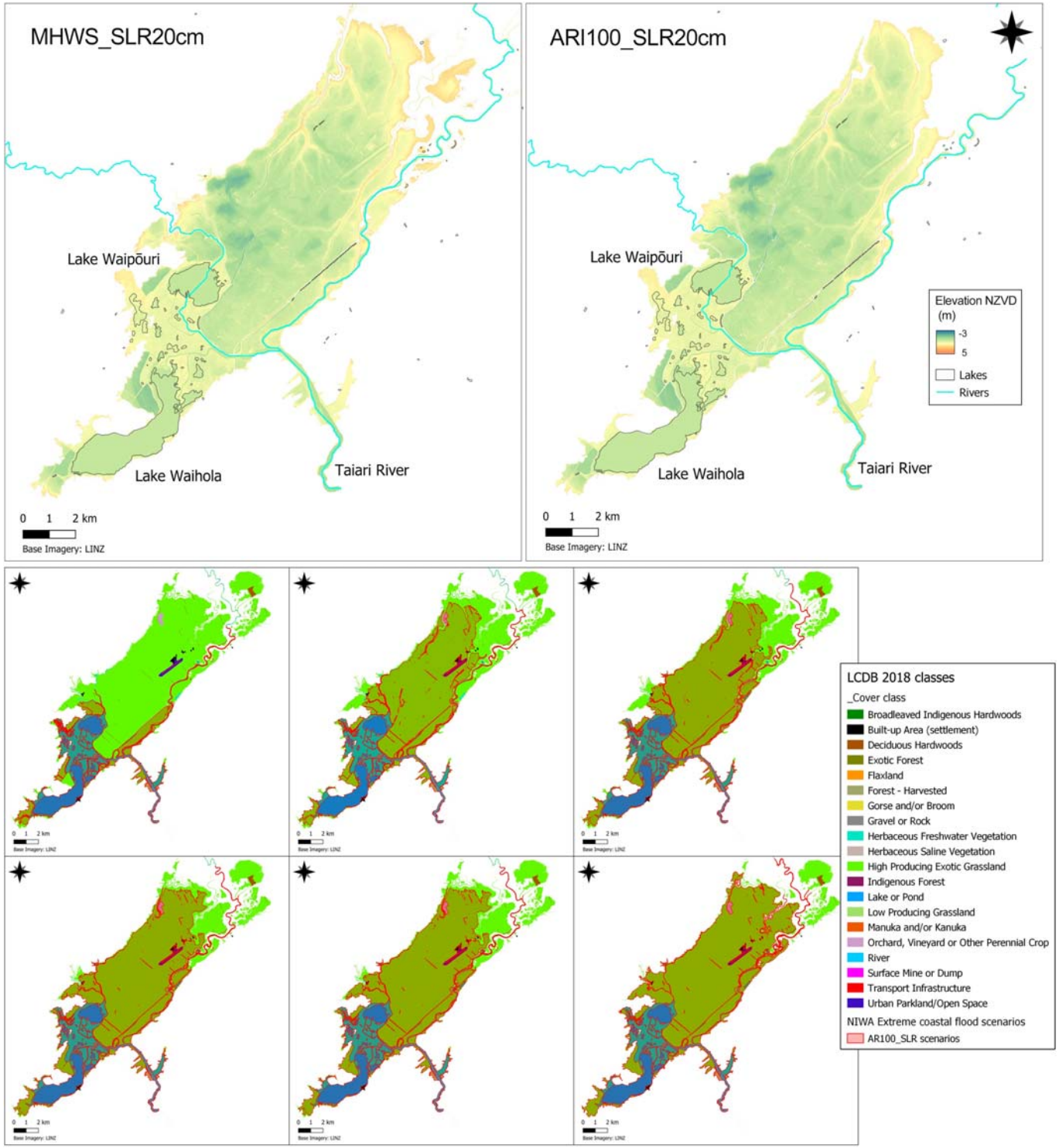


Figure 2: Sea-level rise scenario models show that existing land uses in the lower Taieri are highly vulnerable to only a small increase in relative sea level. Top: Two examples of scenario models incorporating a 20 cm increase in relative sea level. Bottom: Set of six scenarios incorporating relative sea level rise increments of 0-200 cm overlaid on current land cover classes. Source data: LINZ, ORC, NIWA/ESNZ.

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NZCS Regional Representatives

Northland

Laura Shaft
lauras@nrc.govt.nz

Auckland

Lara Clarke
LaraC@barker.co.nz

Matthew McNeil
Matthew.McNeil@aucklandcouncil.govt.nz

Sage Vernall
sage.vernall@aucklandcouncil.govt.nz

Jana Echave
jana@oceanum.science

Waikato

Jamie Boyle
jamie.boyle@tcdc.govt.nz

Joshua Sargent
jsargent@waikato.ac.nz

William Dobbin
William.Dobbin@stantec.com

Celeste Davies-Calway
Celeste.Davies-Calway@waikatoregion.govt.nz

Bay of Plenty

Akuhata Bailey-Winiata
Akuhata.Bailey-Winiata@pdp.co.nz

Laura Robichaux
laura.robichaux@beca.com

Gisborne

Murry Cave
Murry.Cave@gdc.govt.nz

Dylan Barnfield
Dylan.Barnfield@wsp.com

Hawke's Bay

José Beyá
jose@ihbey.com

João Albuquerque
joao.albuquerque@hbrc.govt.nz

Georgina Flowers
georgina.flowers@hbrc.govt.nz

Becky Shanahan
becky.shanahan@pdp.co.nz

Taranaki

Sam Dixon
Sam.Dixon@wsp.com

Wellington

Greta Stuthridge
greta.stuthridge@stantec.com

Upper South

Bryan Scoles
Bryan.Scoles@tasman.govt.nz

Lisa Marquardt
lisa.marquardt@pdp.co.nz

West Coast

Don Neale
dneale@doc.govt.nz

Canterbury

Kate MacDonald
Kate.MacDonald@jacobs.com

Tommaso Alestra
Tommaso.Alestra@boffamiskell.co.nz

Jessica Green
Jessica.Green@beca.com

Otago

Amanda Riddle
Amanda.Riddle@orc.govt.nz

Targeted amendments to the New Zealand Coastal Policy Statement

Karen Bell, Department of Conservation Te Papa Atawhai

Recent changes have been made to national policy statements and national environmental standards under the Resource Management Act 1991 (RMA). The changes include targeted amendments to the New Zealand Coastal Policy Statement 2010 (NZCPS), which is the responsibility of the Minister of Conservation.

These amendments aim to make consenting easier for the following priority activities:

- infrastructure, including renewable electricity generation and electricity transmission;
- aquaculture; and
- mineral extraction.

The NZCPS

The NZCPS is national policy under the RMA applying to the coastal environment. The purpose of the NZCPS is to state policies in order to achieve the purpose of the RMA in relation to the coastal environment of New Zealand. The coastal environment includes areas between the mean high-water springs and the 12 nautical mile limit, and some adjacent land. It contains use and protection policies.

What was the process?

Targeted consultation was undertaken in 2024 prior to the issuing of a discussion document in May 2025.

A discussion document¹ was released, and the public consultation was from May to July 2025 and submissions were sought. Those involved in targeted and public consultation included Māori, industry, local government, professional organisations, environmental NGOs and aquaculture and energy companies. Feedback on the discussion document was considered.

A recommendations and decisions report² was prepared and the Minister of

¹ <https://environment.govt.nz/publications/package-2-primary-sector-discussion-document/>

² <https://environment.govt.nz/publications/nzcps-npshpl-npsib-npsfm-nesf-report-on-recommendations-and-decisions/>

Conservation made decisions to amend two policies in the NZCPS. These changes were gazetted on 18 December 2025 and commenced on 15 January 2026.

What's changed in the NZCPS?

Changes were made to Policy 6: activities in the coastal environment and Policy 8: aquaculture as notified in the discussion document. All other policies in the NZCPS remain unchanged.

Policy 6 changes (activities in the coastal environment) include:

- Strengthening the language to make it more directive.
- Expanding the 'functional need test' to 'functional need or operational need' so that priority activities can locate in the coastal marine area (CMA).
- Restricting the operational need test for mineral extraction to activities that support infrastructure.
- Requiring consideration of the needs of both current and future generations in relation to renewable marine energy.

Policy 8 changes (aquaculture):

- Direct decision makers to provide for aquaculture within aquaculture settlement areas.
- Explicitly require decision makers to recognise the cultural and ecological benefits of aquaculture.

Together with other changes to national direction, e.g. infrastructure, renewable electricity generation and transmission, and aquaculture, these NZCPS amendments are intended to make it easier to consent priority

activities. In combination with changes to other national direction, these amendments will enable the government's growth priorities while maintaining environmental safeguards.

What changed from what was notified?

The operational needs test only applies to mineral extraction in relation to specified infrastructure. This was because there was significant opposition from Māori and fisheries submitters to the operational needs test for mineral extraction.

In policy 8(b) the word 'environmental' was replaced with the word 'ecological' to make it clearer that this was what was meant.

Implementation

These changes must now be considered in decision-making processes. They extend to which they will impact decision making will need to be considered in the context and circumstances of any process.

How do these changes to the NZCPS relate to the wider RM Reforms?

They will inform the design and development of the new national direction that will be prepared in 2026 and 2027 under the new Natural Environment and Planning legislation when it is enacted.

Please contact Karen Bell (email kbell@doc.govt.nz) if you would like further information, or view the amended NZCPS on the DOC website at: <https://www.doc.govt.nz/about-us/science-publications/conservation-publications/marine-and-coastal/new-zealand-coastal-policy-statement/>

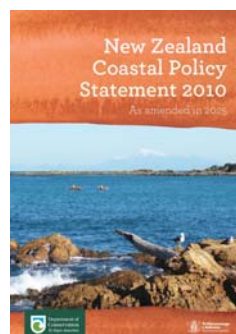


Photo: Karen Bell

Napier 2025: Annual Conference review

José Beyá, Chair of the Local Organising Committee

A huge thank you to all who attended the 2025 conference *Navigating change: charting a course for our coastal future*, which was also notable as being the first NZCS conference to be held in Napier. As well, our thanks go to the NZCS executive committee who trusted us* with the mission to host it!

After a lot of hard work over 10 months or so, it was incredibly rewarding to see so many people enjoying the conference and making great connections, and for us to receive so many compliments about the venues, the food, and the programme.

The highlights of the conference were many and varied, but among the standouts were:

- The announcement of our new life-member Richard Reinen-Hamill. A NZCS member for over 30 years, Richard has been a regular attendee and presenter at NZCS conferences, including as a keynote speaker for 2025. A member of the NZCS Committee during 1995-2001, he also chaired the Society between 1999-2001 and has been a regular contributor to *Coastal News* and the NZCS special publications.
- Insightful and inspiring key notes from Hinewai Ormsby and Kris Faafoi on Cyclone Gabrielle flooding experience and hazard insurance.
- The conference opening ceremony at the national aquarium (www.nationalaquarium.co.nz).
- And, of course, our award winners:
 - **Terry Healy Coastal Project Award:** Christchurch City Council (Tom Simons-Smith) – *Coastal Adaptation Planning Programme*
 - **eCoast NZCS Sustainability Award:** Shari Gallop – *Ngā Herenga o Papatūānuku: Establishing a tangata whenua climate adaptation network*
 - **Best Oral Presentation:** Sam Scott-Kelly – *He raru ki tai - Walking uneasily between two worlds*
 - **Runner-up Oral Presentation:** Peter Quilter – *Practical image processing applications to inform coastal hazard and adaptation planning*

- **Best Student Presentation:** Jialin Zhao – *The effects of structural complexity on the turbulent structure around cubic artificial reefs: An experimental study with ecological insights*
- **Runner-up Student Presentation:** Ashlee Blaymires – *Beyond bathtub modelling: An assessment of built environment exposure to inundation as sea levels rise*
- **Best Poster:** Preston Maluafiti
- **Best Theme Link:** Rahera Ohia
- Plus a special recognition award for Harper Spurway, who at 13 and a student of Avondale College in Auckland, presented her paper *From glory to gutter – our degrading Manukau Harbour* at the conference. Harper was the recipient of the NZCS-sponsored 2024 Auckland Science Fair award, and used the prize money

to attend and present at the conference.

The conference also helped us in expanding our regional network. With the addition of two new representatives, Becky Shanahan and Georgina Flowers, we now have a larger, more motivated team, which aims to enhance the society's presence in the local area.

* The local (and not-so-local) organising committee: Anna Madarasz-Smith, Becky Shanahan, Eddie Beetham, Alison Bear, João Albuquerque, Georgina Flowers, Megan Tuck, Holly Blakely, Chip Pohlen, Hannah Strauss, Simon Bradshaw, Renee Coutts, Shari Gallop, Nicóla Green and José Beyá.

The next conference will take place in Ōtepoti-Dunedin, 9-12 November 2026. Details will be made available on the NZCS website and in the NZCS Digest.



Photos: Murry Cave (top row, middle row left, bottom row far right); NZCS (all others).

News from the regions

Auckland

Lara Clarke, Matthew McNeil and Sage Vernall, Regional Representatives

Ōrewa walkway and seawall project

The Ōrewa walkway and seawall project is nearing completion. The project includes a 600 m long grouted-rock seawall and a 2.4 m wide shared path that follows the seawall alignment along the esplanade reserve. The pathway connects beach access nodes at Kohu and Marine View streets with Kinloch and Remembrance Reserves, restoring high-tide walking access along this section of beachfront.

With the wall foundations requiring excavation up to 1.5 m below beach levels, public use of the beach was disturbed for much of 2025 as construction progressed, with excavations, protective bunds, temporary accessways and construction machinery taking over the beach. Working to a tight timeframe, the contractor was able to open two sections of the walkway to the public before Christmas 2025 and return the beach for public use over the holiday period. With 95% of the seawall now completed, construction activity on the beach has tapered off and the focus is shifting to completing footpaths, landscaping, and fixtures.

Shoreline adaptation plans

In response to escalating risks posed by climate change and sea-level rise, along with growing urgency to shift from reactive coastal management approaches to long-term, proactive adaptation planning, Auckland Council has spent the last past four years preparing for the future of Auckland's dynamic and diverse coastline through the development of the regional Shoreline Adaptation Plan (SAP) programme. At the end of 2025 the Auckland Council's Policy Planning and Development Committee (the Governing Body) approved the final two Shoreline Adaptation Plans, completing a region-wide framework to guide how Auckland Council owned land and assets along the Auckland coastline can be managed in response to a range of changing climate scenarios over the long term.

Serving a key role in delivering Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan, and



Ōrewa walkway and seawall project: Beach access ramp from Kohu Street and new shared path behind the seawall (top) and completed wall section extending north from the Marine View boat ramp (bottom).

advancing the application of the Ministry for the Environment's Dynamic Adaptive Policy Pathways approach to the future management of Tāmaki Makaurau's coastlines, completion of the regional SAP programme marks a substantial step forward in preparing Auckland for climate-driven coastal change. Furthermore, this achievement reflects a significant collective effort across a wide range of both internal and external programme partners, including mana whenua, asset owners and local communities.

With the regional picture now complete, the focus has shifted to implementation. Implementation of the SAP Programme regionally is an ongoing and evolving process, requiring continued collaboration across council departments, council controlled organisations, mana whenua, communities, asset owners, and businesses. Key priorities include, but are not limited to, embedding SAP findings into decision making and integrating the plans into relevant council

planning and asset management documents, such as Reserve and Regional Park Management Plans, Local Board Plans, and Asset Management Plans.

The SAPs by area can be accessed at: www.aucklandcouncil.govt.nz/sap-by-area

TRIXYS wave buoy deployment at Anchorite Rock

On Thursday 11 December 2025, Auckland Council's Coastal Processes team participated in an exciting collaboration with New Zealand Defence Force – Defence Science and Technology (DST), the University of Auckland, Oceanum, and Calypso Science to deploy a TRIAXYS wave buoy at Anchorite Rock in the Hauraki Gulf. This buoy will provide high-quality wave data to support and validate numerical modelling, improve wave forecasting for the Auckland region, and contribute valuable information to DST and the University of Auckland's SAR4SaR project.

This deployment was made possible through the collaboration of all project partners.

Wave buoy deployment, recovery, data telemetry, and processing involve complex logistics and significant costs; however, through the combined expertise and contributions of each organisation, the project has been successfully delivered. Live wave buoy data will be available to view through the Council's Coastal Monitoring Portal (<https://coastalmonitoringac.netlify.app>).

Bay of Plenty

Cole Burmester, Akuhata Bailey-Winiata and Laura Robichaux, Regional Representatives

He aitua, he aitua-ka tangi te ngākau, ka mihi te aroha

The New Zealand Coastal Society, and especially the Bay of Plenty Chapter, acknowledges the recent events at Mauao and Welcome Bay around Tauranga. Following the wettest day on record for the city (274 mm in 24 hours), multiple landslips occurred across Tauranga Moana, including major slips at Mauao that affected the Mount Maunganui Beachside Holiday Park and Mount Hot Pools, taking the lives of six people, and at Welcome Bay, taking the lives of two people. In the days that followed, Urban Search and Rescue teams, iwi, Councils, and communities mobilised to support recovery and collectively grieve.

We recognise the mana of Mauao and the deep relationship tangata whenua of Tauranga Moana and beyond hold with Mauao, alongside its central role in shaping the identity and lives of communities and visitors alike. NZCS pays respects to those who have lost their lives, their families, and the many people involved in recovery and the next phases.

NZCS remains committed to supporting our members, and to fostering conversations and actions that strengthen our understanding of coastal risk, resilience, and adaptation – grounded in respect for, and inclusion of, a plurality of knowledge systems.

Hawke's Bay

José Beyá, João Albuquerque, Georgina Flowers and Becky Shanahan, Regional Representatives

Public consultation on funding coastal hazard management

Hawke's Bay Regional Council has launched public consultation on how future coastal

hazard management work should be funded as part of the proposed Clifton to Tangoio Coastal Hazards Strategy 2120. The strategy is being developed jointly by regional and territorial councils together with iwi representatives and aims to provide a long-term framework for responding to coastal erosion, flooding, and sea-level rise along the Hawke's Bay coast. The consultation asks residents to consider how the costs of adaptation and hazard mitigation should be shared across communities. For more, see <https://www.hbrc.govt.nz/our-council/news/article/1959/community-asked-how-coastal-hazard-risks-should-be-funded>

Napier wharf closed

Napier City Council closed Nelson Quay Wharf in Ahuriri's Iron Pot harbour to all land and water access in February 2026 following advice related to structural instability. Previous investigations had already identified significant structural issues with the historic wharf, which dates back to the late 19th century, and earlier restrictions had limited access to authorised users only. The latest closure means that even owners of vessels moored alongside the wharf cannot access their boats from either the wharf or the water, affecting around 17 vessels. Council has indicated that public safety is the immediate priority while engineering assessments continue to determine long-term repair or replacement options.

Clifton camp evacuated

Clifton Motor Camp, located near Cape Kidnappers on the Hawke's Bay coast, was evacuated in February 2026 after Hastings District Council declared the site at extreme risk of landslide from adjacent coastal cliffs. A geotechnical report identified a high likelihood of slope failure, prompting authorities to issue a notice requiring campers and permanent residents to vacate within 24 hours. The site sits beneath rapidly eroding coastal cliffs that have experienced

repeated failures in recent years, highlighting the ongoing challenges of managing cliff-top and cliff-base hazards along Hawke's Bay's soft sedimentary coastline. The evacuation has renewed discussion about long-term risk management and the future of development in areas exposed to coastal erosion and landslip hazards.

New wave buoys in Hawke's Bay

Napier City Council and Hawke's Bay Regional Council have recently deployed two wave buoys: a Sofar Spotter buoy near the Napier City Council wastewater treatment plant outfall, and an Obscape OBS Buoy 7 watt near the Esk river mouth.

According to Anoop Mathew, Portfolio Lead at NCC, Napier City Council deployed the wave buoy offshore as part of the planning and delivery of the Wastewater Treatment Plant (WWTP) outfall project. The purpose of the buoy is to collect accurate, site specific wave and weather data over a three year period to support safe and efficient planning, detailed design, and construction of the outfall. Reliable data is critical for validating design assumptions, identifying safe marine working windows, managing construction risk, and meeting regulatory and environmental requirements.

"The Esk river mouth buoy was deployed to help understand the wave conditions that cause the river mouth to close. Of course other factors such as river flow are also relevant in these occasions, but having the actual wave data reduces the uncertainty and allows us to find the thresholds in which these events can happen. This way we can engage our operations team so they are ready to reopen the river mouth whenever the wave forecast shows similar conditions and significant rain in the near future. Other benefits this wave data provide are the refinement of the wave forecast models we are using, wave forcings for analysis of air quality due to sea spray and real time wave



HBRC's Esk river mouth wave buoy before and after deployment (Photos: HBRC).

conditions for our Harbourmasters” says HBRC’s Coastal Specialist João Albuquerque.

Upper South

Bryan Scoles and Lisa Marquardt, Regional Representatives

Tasman Bay coastline erosion event

On 3 February 2026, sections of the Tasman Bay coastline experienced a notable erosion event. This was driven by a short-lived, locally generated wind event during which peak wave heights coincided with a spring high tide. Although the significant wave heights were only approximately 1.6 m, their occurrence during elevated tidal conditions allowed wave energy to reach higher positions on the beach face than is typically observed.

While 1.6 m waves may seem modest in a broader New Zealand context, the wave climate in Tasman Bay is generally low-energy because the region is sheltered from the south-westerly swells that affect the exposed West Coast. Consequently, the local shorelines are adapted to lower wave energy regimes. Additionally, Tasman Bay experiences the highest tidal ranges in New Zealand, further enhancing the capacity for elevated wave run-up and contributing to erosion higher on the beach profile than usual.

At Parapara in Golden Bay, this storm event provided clear evidence of the effectiveness of Coast Care plantings in reducing the impacts of storm-wave erosion on vulnerable beaches. The Tasman District Council (TDC) Reserves team has implemented an active Coast Care programme at this site, which involves removing exotic vegetation, gently regrading the upper shoreface, and replanting it with native dune species such as pikao (*Ficinia spiralis*) and *Spinifex sericeus*. When undertaking these works, TDC seeks cooperation from beachfront property owners; where landowners do not agree to participate, Coast Care activities are not carried out on the frontage of those properties.

Three landowners had opted not to engage with the Coast Care programme. Following the recent event, these properties experienced a disproportionately high level of erosion. In contrast, the sections of shoreline where native dune vegetation had been established showed markedly reduced erosion, as the restored dune system



(Top) Section beach at Parapara without coast care plantings showing erosion effects. The foredune resulting from the Coast Care efforts can be seen on the left-hand third of the image. (Bottom) Section beach at Parapara with coast care plantings showing limited erosion effects. (Photos: TDC)

effectively dissipated wave energy. The untreated sections, by comparison, experienced substantial scarp formation. A similar event occurred in the middle of 2025 as well. Given the graphic evidence of the effectiveness of coast care the residents of the three properties are now working with TDC to be incorporated into the coast care programme for this location.

Bryan Scoles and Harry Allard

eDNA sampling campaign

In December, an eDNA sampling campaign was completed across the Nelson/Whakatū coastal marine area. This work comprises phase 1 of our project as a partner region in the EU’s BioProtect programme, which provides qualifying regional authorities with the funding and tools to collect new data for future marine spatial planning and conservation. This project is co-led by the Cawthron Institute and Nelson City Council, with a broad range of partnering stakeholders, mana whenua, and agencies taking part. Over 30 people helped us collect eDNA samples for this first survey, which will be paired with a winter survey in 2026. We hope to use the results to classify aquatic ecotones throughout Nelson, and provide much-needed species lists to inform future

marine management. Thanks to the Cawthron, NCC, Tasman Bay Guardians, Port Nelson, Kotahitanga mō te Taiao Alliance, Plant and Food, DOC, MaLab, Seaquench, and mana whenua for assistance.

Harry Allard

West Coast

Don Neale, Regional Representative

Environmental impacts from accumulation of Buller River sediment

The Orowaiti River at Westport has migrated 3 km eastwards over the last 80 years due to the seaward advance of the Westport shoreline east of the Buller River mouth.

In 2025 West Coast Regional Council gained Envirolink funding to engage Professor Ian Fuller to provide advice on the geomorphic impacts of long-term Buller River sediment delivery on coastal evolution, estuary behaviour, and shoreline erosion risk.

The report used historic aerial imagery (dating back to the 1940s), shoreline mapping, estuary cross-section surveys and field observations to assess how sediment supply and coastal processes have driven coastline advance, barrier growth and river

mouth migration over time. The analysis showed that significant sediment delivery from the Buller River has progressively extended the Orowaiti Barrier eastward by several kilometres over the past century, forcing the Orowaiti River mouth to migrate east and altering flood flow pathways and estuary morphology.

The report concludes that barrier extension has increasingly confined flood flows within the Orowaiti Estuary, resulting in erosion of the landward estuary margin. During large flood events, a proportion of Buller River flow spills into the Orowaiti channel, providing sufficient energy to drive localised erosion where flows are constrained by the barrier alignment. While shoreline erosion is ongoing, current erosion rates are generally lower than those experienced in the mid-twentieth century and may reflect the estuary and barrier system moving toward a form of dynamic equilibrium, although continued barrier extension and eastward migration of erosion risk is considered likely.

From a management perspective, the report recommends working with natural geomorphic processes rather than attempting large-scale intervention. Cutting channels through the barrier is not recommended due to the high sediment supply and likelihood of rapid infilling. Instead, the preferred approach is ongoing monitoring of sediment movement, barrier growth and erosion response to flood and storm events to support adaptive coastal management. The report also outlines application of the PARA framework (Protect, Avoid, Retreat, Accommodate), noting that long-term planning should focus on avoiding new development in high-risk erosion areas and considering managed retreat where necessary, rather than relying on hard protection structures that are likely to be outflanked over time.

The full report can be viewed at: <https://www.wcrc.govt.nz/repository/libraries/id:2459ikxj617q9ser65rr/files/id:2umimfsyj1cxy3qokop>

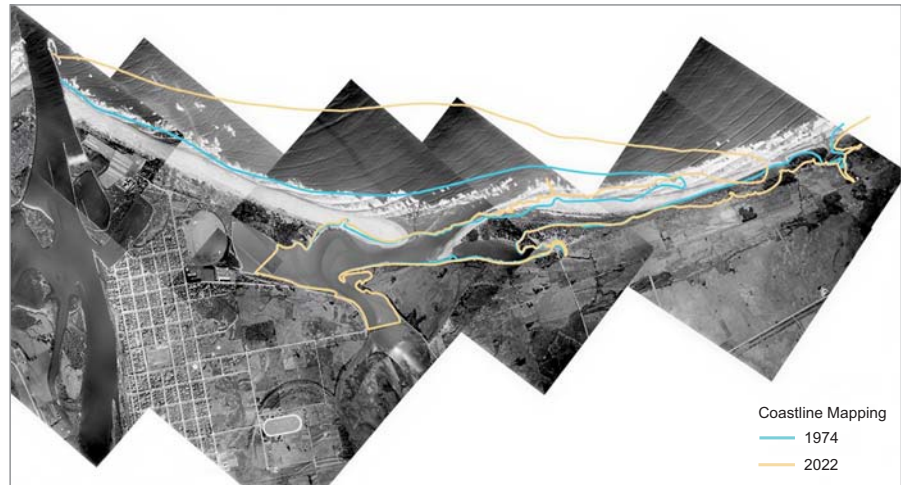
Paulette Birchfield

Canterbury

Kate MacDonald, Tommaso Alestra and Jessica Green, Regional Representatives

ICG 2026 held in Canterbury

During 2-6 February 2026, the International Conference on Geomorphology (ICG) was held at Te Pae in Christchurch. The ICG saw



Westport Coastline in 1943, with 1974 and 2022 limits mapped. This figure shows both rapid and extensive coastal progradation east of the Buller River mouth as well as eastward migration of the Orowaiti River mouth associated with extension of the Orowaiti barrier (Graphic: WCRC).

around 950 delegates attend with sessions covering all branches of geomorphology. There were several coastal-themed sessions, which were all well attended. The ICG also saw a successful Young Geomorphologists programme run where earlier career researchers and students attended several workshops to build their career skills, a field trip to Cass Station, and social and networking events. We thank those who were involved and who attended. It was a very successful event overall!

A coastal geomorphology themed mid-conference field trip was run by Sarah McSweeney and Sophie Horton, with guest speakers Kate MacDonald and Laura Somerville joining us at Amberley Beach and Gore Bay respectively, and with support from Deirdre Hart. The field trip travelled to Gore Bay in the Hurunui region (about 1.5 hours north of Christchurch) and then visited several interesting sites on the way back to Christchurch including the Hurunui River hāpua, Pegasus Bay winery, Amberley Beach, and Woodend Beach.

Errant wave buoy retrieved

The UC/ECan Pegasus Bay Spotter wave buoy broke free of its moorings on 4 March 2026 at ~1.45 pm. We are in the process of redeploying and hope to have it back in place over the next couple of months.

The buoy did capture some interesting data while it was drifting (moorings and all attached). Its track is shown in Figure 1, which gives us some good information about currents and circulation in Pegasus Bay. After



ICG 2026 young geomorphologists field trip to Cass (Photo: Sarah McSweeney).



ICG 2026 field trip to Gore Bay (Photo: Sarah McSweeney).

breaking free on 4 March, the buoy drifted south across Pegasus Bay for two days. On 6 March, it did a small loop and then switched direction to drift towards the north. It was eventually recovered just offshore of Waimari Beach (Christchurch). Wave conditions were logged every 15 mins after the buoy switched to GPS tracking mode (at ~6 pm 4 March) and the significant wave height, wave direction, and wind speed and direction are shown in Figure 2.

Sarah McSweeney

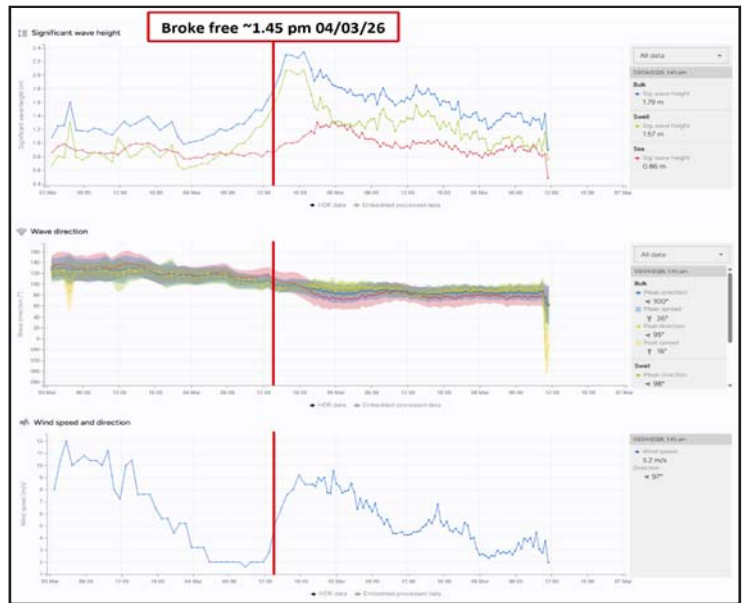
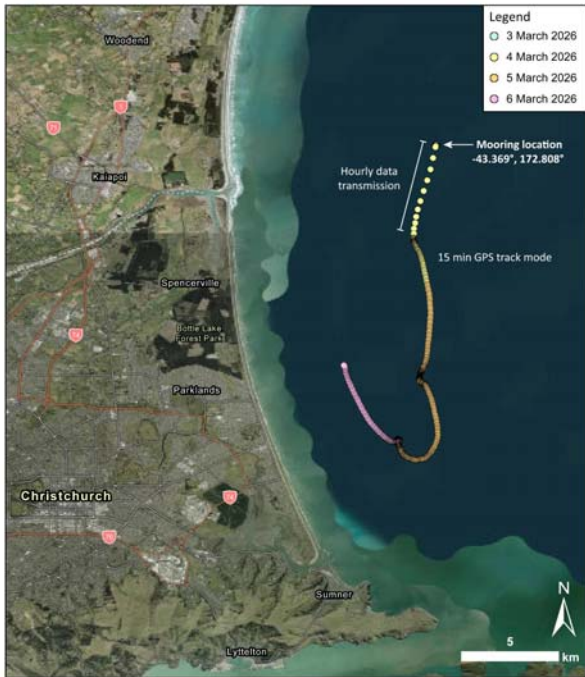


Figure 1 (left): Pegasus Bay wave buoy GPS track after breaking free of its moorings on 4 March 2026. It was recovered on 6 March 2026. The GPS location was logged every 15 minutes or so from late on 4 March and prior to then it was logging data hourly.

Figure 2 (right): Significant wave height, wave direction, and wind speed and direction (note wind data are estimates only) for the buoy as it drifted across Pegasus Bay.

Central Government update

The Government is replacing the Resource Management Act 1991 (RMA) with a new planning system that delivers on its commitment to unlock infrastructure and housing development, support New Zealand’s primary industries, and drive significant growth while protecting what is important. A major change is the shift to two

separate Bills that separate land-use planning and natural resource management:

- 1 The Planning Bill establishes a framework for planning and regulating the use, development and enjoyment of land.
- 2 The Natural Environment Bill establishes a framework for the use, protection and enhancement of the natural environment.

These bills are being considered by the Environment Select Committee and their report is due by 26 June 2026.

You can find more information about this work on the Ministry for the Environment website <https://environment.govt.nz/what-government-is-doing/areas-of-work/rma/rmreform/#the-new-system>

Conference 2026: Building coastal resilience through collaboration

The 34th annual NZCS conference will be held at Tūhura Otago Museum in Ōtepoti Dunedin, from the 9th to the 12th of November 2026. This is your annual opportunity to share knowledge across a range of coastal management topics and meet with peers from around New Zealand.

This year’s conference is built around the whakatauki He moana pukepuke e ekengia e te waka – a choppy sea can be navigated by the canoe. The whakatauki speaks to navigating uncertainty and change through collective effort, supporting each other and common purpose. In this spirit, the 2026 NZCS Conference will focus on

strengthening resilience through interdisciplinary collaboration: for our coastal environments and communities, and among ourselves as coastal and environmental specialists.

As an island nation, Aotearoa New Zealand has always been shaped by the sea. From the first Māori navigators to contemporary coastal communities, generations have learned to live with, adapt to, and draw knowledge from dynamic coastal environments. This enduring relationship places Aotearoa New Zealand in a unique position to lead discussions on working with nature, partnering with communities,

and advancing coastal resilience in a changing climate.

The conference also holds space to acknowledge connections that extend across the wider Pacific – from the Pacific Islands and Australia to the eastern Pacific margins of the Americas – broadening perspectives and fostering international collaboration.

For more information and registration details see <https://www.coastalsociety.org.nz/conferences/2026>

Background photo: Dunedin and inner Otago Harbour (Public Domain).

NZCS Scholarship winners 2025

Preston Maluafiti (University of Otago) Māori and Pacific Islander MSc Scholarship

Variability of bioactive compounds within Undaria pinnatifida in Otago Harbour

Preston is a Samoan first year PhD candidate in the Marine Science Department at the University of Otago. He holds a Bachelor of Science (Hons) in Marine Science (2023). His research focuses on the extraction of valuable compounds from the invasive kelp *Undaria pinnatifida* (wakame) under the supervision of Prof Chris Hepburn and Dr Duong Le.

U. pinnatifida was first documented in New Zealand in 1987 and has spread to all major ports and coastlines across New Zealand. Pilot *U. pinnatifida* control programmes led by Kāi Tahu Tangata Tiaki (customary fishery managers) focused within customary protection areas have removed over 200 tonnes of biomass since 2022. Hand removal has proven an effective control methodology, but cost is a major consideration, limiting sustainability of these operations. *U. pinnatifida* is a valuable food and a known source of high-value bioactive compounds. Kāi Tahu is investigating bioactive products from *U. pinnatifida* such as fucoxanthin and fucoidan to fund a sustainable control programme. These compounds have a wide variety of known health benefits, however, there are seldom studies on bioactive compounds within *U. pinnatifida* across New Zealand.

Preston's aims to fill this gap in knowledge by extracting various compounds across different spatial and temporal gradients. By understanding how environmental

variability modulates bioactive compounds within *U. pinnatifida*, an industry of high-value seaweed products could form that supports local communities.

Eduardo Basquin (University of Auckland) Student research PhD Scholarship

Understanding the impact of changing sea-level on estuarine open coast sediment exchange in New Zealand

Eduardo is currently pursuing a PhD at the University of Auckland under the supervision of Professors Karin Bryan and Giovanni Coco. Prior to this, he completed a master's thesis in France, where he is originally from, focusing on wave propagation in the Iroise Sea and, more broadly, on coastal processes.

Eduardo's PhD research aims to improve our understanding of the long-term morphological evolution of estuaries in the context of climate change. Under the influence of sea-level rise (SLR), changes in riverine sediment supply, and evolving wind conditions, estuaries are expected to undergo significant morphological adjustments. However, their response over long timescales, spanning decades to centuries, remains relatively understudied.

Using a numerical modelling approach, Eduardo's research investigates the relative role of these key drivers (SLR, sediment supply, and wind changes) in shaping estuarine evolution. In addition, he aims to identify estuaries that may be particularly vulnerable to climate change by analysing their present-day morphology, hydrodynamic conditions, and stratigraphic characteristics.

Ultimately, this research seeks to improve our ability to anticipate how estuaries may evolve over the coming decades. The insights gained will support the New Zealand coastal community by providing scientific knowledge that can inform sustainable management, planning, and conservation strategies for these dynamic environments.

Rose Somerville (University of Otago) Student research MSc Scholarship

An investigation of the present and future condition of pikao in the Ōtākou region

'Manaakitia nga tukemata o Tāne' – 'Caring for the eyebrows of Tāne'

Rose is completing a Master of Science at Ōtākou Whakaihu Waka (University of Otago), having finished her BSc in Geography and Ecology at OU in 2023. In her final year she was invited on a research and monitoring trip to Rakiura, Stewart Island, where she saw a flourishing pikao/pingao (*Ficinia spiralis*) population. Upon her return to the mainland, she became aware the species had once dominated much of coastal Ōtākou but had suffered a significant decline, and despite conservation effort was still little seen within the region – a pattern likely repeated across much of Aotearoa New Zealand. This inspired her current research under the supervision of Dr Teresa Konlechner.

The research will provide a regional baseline assessment of the distribution and condition of pikao populations within Ōtākou, filling a significant gap in the existing research. It draws on existing records and targeted field surveys of remnant and planted populations within coastal dune systems documenting their spatial extent, condition, and apparent vulnerability in relation to local environmental context.

Rose believes this research will have direct applied benefits for dune restoration and species conservation in Aotearoa. The comprehensive baseline will serve as a point of comparison for future monitoring, strengthening our understanding of the species response to conservation action.



Preston Maluafiti



Eduardo Basquin



Rose Somerville

SCHISM Workshop review

From 22–24 July 2025, Earth Sciences New Zealand (formerly NIWA) Hamilton hosted a highly successful three-day hands-on workshop on the Semi-implicit Cross-scale Hydrosience Integrated System Model (SCHISM). Funded through the New Zealand Coastal Society Professional Development Grant awarded to Dr Christo Rautenbach, the workshop brought together participants from a wide range of vocations – not only physical oceanographers, but also river and flood modellers, coastal hazard practitioners, consultants, and researchers working across different scales and applications.

SCHISM is a powerful, open-source, unstructured-grid modelling system designed to simulate 3D baroclinic circulation across environments ranging from small estuaries and rivers to continental shelf and ocean-scale systems. While the software presents

a steep learning curve, the course presenters were committed to making the introduction as smooth and practical as possible.

Participants were guided through the fundamentals of SCHISM, including model structure, numerical considerations, and best-practice workflows. A strong emphasis was placed on practical application: attendees implemented a small NZ-based case study designed to keep computational times manageable, while still demonstrating real-world modelling principles.

The workshop featured expert instruction from Dr Vanessa Hernaman (CSIRO) and Dr Gael Arnaud (MetService). The event was further enriched by a special guest appearance from Dr Y Joseph Zhang, lead developer of SCHISM from the Virginia Institute of Marine Science (VIMS). His insights into the model's development,

philosophy, and future direction were a highlight for many attendees.

By the end of the workshop, participants had not only gained exposure to SCHISM's capabilities but had also developed the confidence and foundational skills needed to continue exploring and applying the model within their own institutions. The strong engagement across disciplines highlighted the growing demand for flexible, cross-scale hydrodynamic tools to address New Zealand's coastal and flood-related challenges.

Overall, the workshop demonstrated the value of collaborative, community-supported modelling approaches and the importance of building local capability in advanced numerical tools.

See *Coastal News 85 (November 2024)* page 10 for more background on SCHISM.

NZCS Management Committee

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Ana Serrano & Connon Andrews
ana.serrano@boprc.govt.nz
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shari.gallop@pdp.co.nz

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Karen Bell & Zhonghou Xu
kbell@doc.govt.nz
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Andrew Allison
andrew.allison@urbanintelligence.co.nz

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Bryony Miller & Ruby McKenzie Sheat
bryony.miller@e3scientific.co.nz
ruby.mckenzieheat@earthsciences.nz

Awards and Scholarship Coordinator

Bryony Miller
bryony.miller@e3scientific.co.nz

University & Education Coordinator

Sophie Horton
sophie.horton@canterbury.ac.nz

Membership Coordinator

Andrew Allison
andrew.allison@urbanintelligence.co.nz

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Megan Tuck & Zhonghou Xu
megan.tuck@aucklandcouncil.govt.nz
zhonghou.xu@earthsciences.nz

Professional Development Coordinators

Megan Tuck, Eddie Beetham & Marli Geldenhuys
megan.tuck@aucklandcouncil.govt.nz
ebeetham@tonkintaylor.co.nz
marli.geldenhuys@aucklandcouncil.govt.nz

Central Government Liaison

Karen Bell
kbell@doc.govt.nz

Administration & Communications Coordinators

Renee Coumts & Belen Rada Mora
nzcoastalsociety@gmail.com

Coastal News Editor

Charles Hendtlass
cellwairmonk@gmail.com

For member profiles, see <https://www.coastalsociety.org.nz/about-us/management-committee>

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