Te Hunga Takutai o Aotearoa
NEW ZEALAND COASTAL SOCIETY

Coastal News

Newsletter of the New Zealand Coastal Society: a Technical Group of Engineering New Zealand

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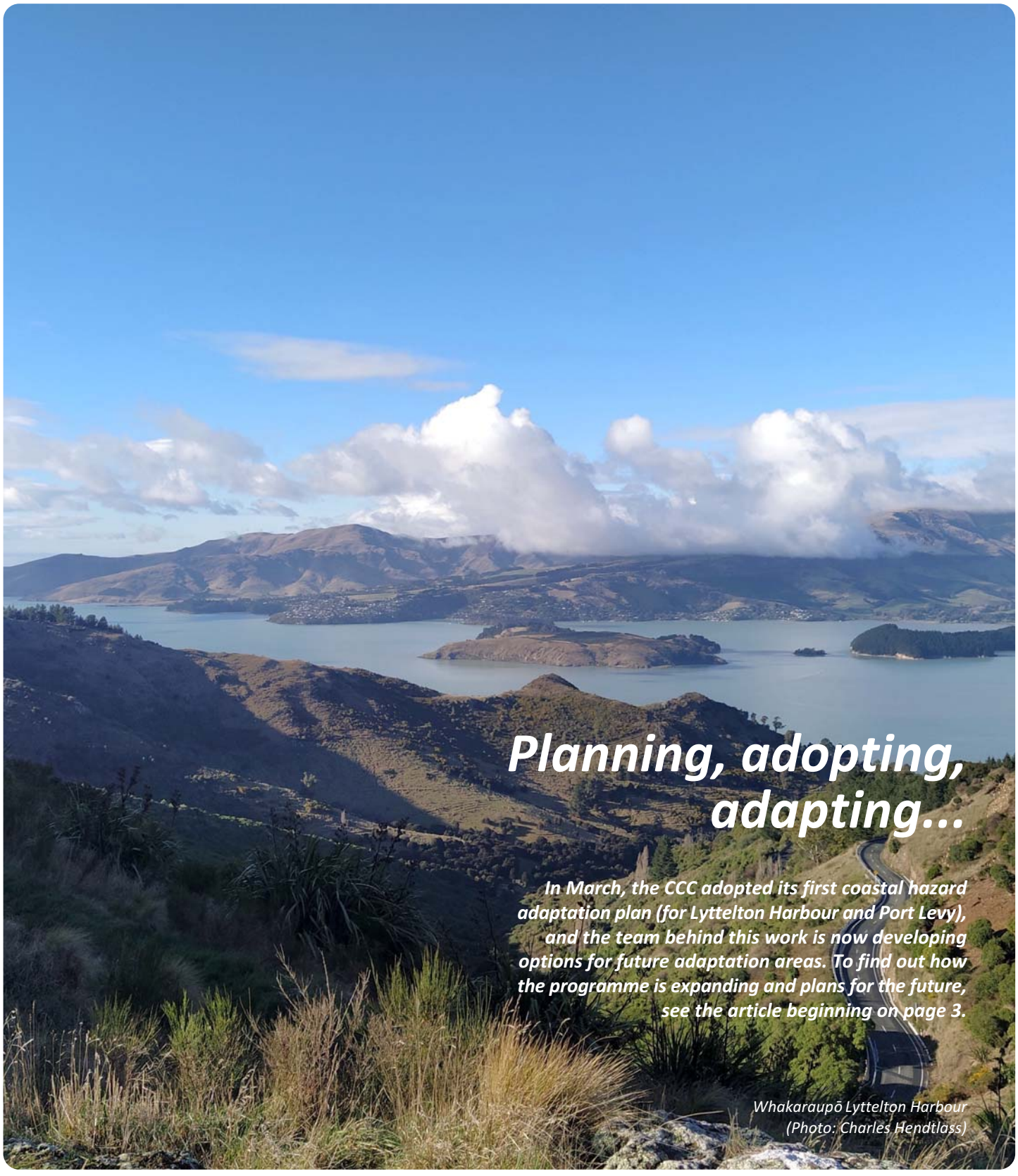

Planning, adopting, adapting...

In March, the CCC adopted its first coastal hazard adaptation plan (for Lyttelton Harbour and Port Levy), and the team behind this work is now developing options for future adaptation areas. To find out how the programme is expanding and plans for the future, see the article beginning on page 3.

Whakaraupō Lyttelton Harbour (Photo: Charles Hendtlass)

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Word from the Chair

Kia ora koutou, and welcome to our final *Coastal News* issue of 2025. We're writing the introduction to this issue from our annual conference, on a stunning day in Napier. This year's conference has been fantastic, with opportunities to connect with the coastal community, inspiring keynote speakers, and the celebration of Richard Reinen-Hamill as our newest New Zealand Coastal Society Life Member.

We'll provide a more thorough update on all of the highlights of the conference in the next *Coastal News* Issue, but for now want to acknowledge the efforts of José Beyá and the Local Organising Committee in delivering an outstanding conference.

This issue of *Coastal News* contains an article on adaptation planning in Christchurch, work that was recognised with the Terry Healy Award at the conference. We also have an update on assigning ecological values to marine benthic habitats, and an article describing the holistic research undertaken as a collaboration between Lincoln University and Te Whakatōhea. Ryan Abrey provides some reflections on the 2025 Coasts and Ports conference in Adelaide, as we all look forward to hosting the conference in Wellington in 2027. We celebrate some of our recent graduates in the University News section, as well as providing recent news from the regions and broader news updates from the coastal zone.

This issue also marks the last from me (Colin) as co-chair. I'd like to acknowledge Sam Morgan for his hard work and all his contributions to NZCS as co-chair, and to thank and acknowledge Connon Andrews for stepping in as co-chair in Sam's absence for the remainder of the year. It's been a challenging year, but I remain excited about NZCS and our future direction.

Wishing you all a great holiday season, and a relaxing summer break.

Colin Whittaker 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

Adaptation Planning with communities in Ōtautahi Christchurch

By Jess Weston and Tom Simons-Smith, Christchurch City Council

Laying the groundwork

In November 2020, Christchurch City Council agreed to begin adaptation planning with low-lying coastal and inland communities likely to be impacted by rising sea levels. Since then, the Council's Coastal Hazards Adaptation Planning (CHAP) team has established a suite of foundational documents/tools, has delivered adaptation planning in the first Adaptation Area, and is now planning towards acceleration of the programme.

Some of the key pieces of work delivered to date include:

- The Coastal Adaptation Framework (CAF), which outlines the Council's high-level engagement principles and planning approach. It serves as a bridge between central government direction (such as MfE Coastal Hazards and Climate Change Guidance) and our local context. In particular, the CAF establishes that adaptation planning shall be driven by a Panel (of community and rūnanga representatives) who are supported by a group of specialists – the Specialist & Technical Advisory Group, or STAG.
- The Catalogue of Coastal Hazard Adaptation Options, outlines and describes the range of options available for adapting to coastal hazards. This document provides the long-list of options used in adaptation planning and can be adapted to include new options as they are identified by Council and community.
- The Coastal Hazards Assessment (CHA), which looks at current and future coastal hazards (coastal erosion, coastal flooding, and rising groundwater) across the entire Christchurch District. The CHA underpins the Coastal Hazards Portal, a publicly available spatial platform used to visualise projected (modelled) hazard exposure under various future sea level rise scenarios.
- The Risk Explorer (or Resilience Explorer), builds on the CHA and other hazard assessments by combining hazard mapping with asset and element data, helping us to understand the impacts (damages), vulnerabilities, and consequences that various assets will experience when exposed to natural hazards.

The work above serves as the foundation for local adaptation planning across the district. More site-specific modelling, assessments and community engagements are delivered as part of adaptation planning in each Adaptation Area. In addition, adaptation planning processes are modified to suite the context in which they are being applied.

The remainder of this article focuses on the recent adaptation planning process in Whakaraupō Lyttelton Harbour and Koukourarata Port Levy.

Spotlight: The Whakaraupō Lyttelton Harbour and Koukourarata Port Levy Coastal Hazards Adaptation Plan

The Coastal Hazards Adaptation Plan for Whakaraupō Lyttelton Harbour and Koukourarata Port Levy was approved by Christchurch City Council in March 2025. The Coastal Hazards Adaptation Plan (the Plan) took approximately two years to complete, involving extensive engagement through:

- Around 20 Panel meetings (3-hours in length), which were held as often as every three weeks. The Coastal Panel was responsible for considering adaptation options and identifying (with the support of the STAG) preferred adaptation pathways that were then submitted to the Council for a decision.
- Over 40 hours of workshops were held with the STAG, in addition to an estimated 25 hours of individual contribution from each of the 12 members.
- Separate hui at several points in the process with Te Rūnanga o Koukourarata and Te Hapū o Ngāti Wheke.
- Broader community consultation (at three stages) with the wider public.
- Consultation with relevant utility providers, such as Waka Kotahi, Lyttelton Port Company and Orion.
- Regular reporting to the Coastal Hazards Working Group – the governance group comprising elected members, rūnanga representatives and observers (elected members from neighbouring councils).

The process supported the development of a plan that is:

- Directed by community input – both from the Panel and the wider public.
- Understood by, and generally supported by, the community.
- Clear in its focus on public assets and service provision, rather than managing risks to private assets.
- Defensible, with a robust evidence base and clear and numerous opportunities for public input.
- Delivered so to provide an adequate level of detail to support asset managers with implementation. In our case this involved delivering asset-specific adaptation pathways rather than broader plans that require significant interpretation and further work by asset managers.

The process

The sections below focus primarily on the technical aspects of the adaptation process, including the identification of Priority Adaptation Locations, screening of adaptation options, and development of adaptation pathways. However, these stages represent only a portion of the broader planning process. As illustrated in Figure 1, the overall process also encompassed extensive engagement, which is shown in the medium shade of blue. The lightest shade represents activities completed by Council, while the darkest shade indicates stages involving the Coastal Panel. Engagement activities, depicted in the medium blue, included collaboration with local rūnanga, multiple rounds of public consultation, and a staged decision-making process involving both the Coastal Panel and the wider community. This broader context was essential to ensuring the final adaptation pathways were grounded in local values, technically robust, and well understood by the public.

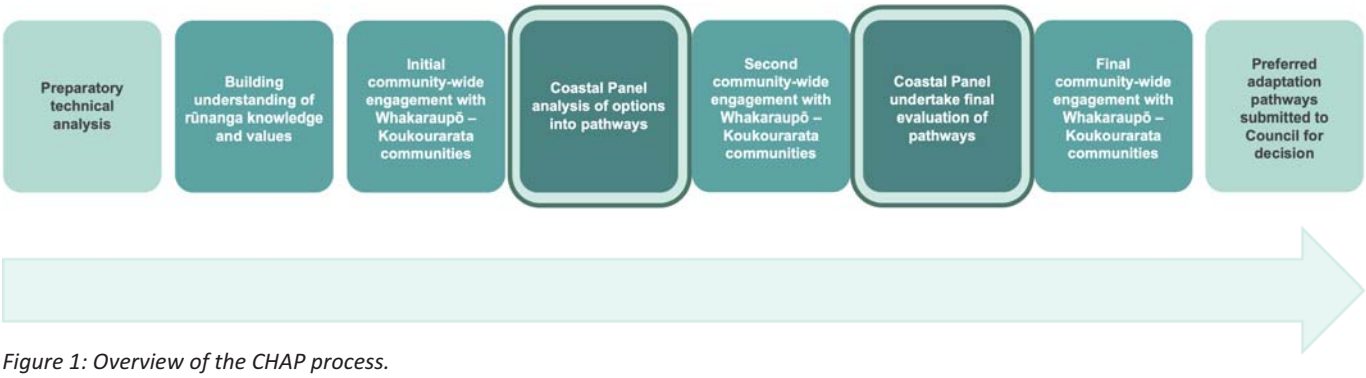


Figure 1: Overview of the CHAP process.

The Coastal Panel

Coastal Hazards Adaptation Planning for Whakaraupō Lyttelton Harbour and Koukourarata Port Levy began in late 2022, after a decision was made by Council to pilot local adaptation planning in this area. Prior to commencement of the process, an Expression of Interest process was used to appoint the members of the Coastal Panel. A number of factors informed the appointment process, namely:

- the need for rūnanga representation;
- achieving representation from across the geographic area;
- people that were well connected in their communities;
- a focus on youth, given the long-term view taken through adaptation planning;
- city-wide representation, so to promote a wider view and continuity into later adaptation phase;
- individuals with a diverse range of interests, such as business interests; and
- members of relevant elected bodies, such as the local community board and Water Zone Committee.

Identifying priorities – 'priority adaptation locations'

To determine how adaptation planning efforts would be focused within Lyttelton Harbour and Port Levy, the CHAP team recommended identifying Priority Adaptation Locations (PALs). These locations were determined by using the Risk Explorer to pinpoint public assets projected to be at risk over the next 30 years. Where these assets were particularly significant or critical, and where multiple assets at risk were concentrated in a single area, the CHAP team proposed PALs as a way to structure subsequent work around specific geographic areas. These PALs were tested with the Coastal Panel and STAG to ensure they would be an appropriate way to focus adaptation efforts.

Network-wide planning

Consideration was given to how this site-by-site approach might address, or fall short in addressing, networks that span across and between these locations. In particular, it was recognised that a more holistic network-focused approach would better support planning for the road network.

This approach enabled possible servicing changes (examples below) to be considered within the context of the entire road network, rather than solely at individual sites. It also facilitated discussions around potential mode shifts, such as increasing the use of marine infrastructure (and access over water) to mitigate the growing risks to the road network.

The possible road servicing changes discussed with the Coastal Panel and wider community are shared below. In many cases, these changes are included in the preferred adaptation pathways that have been approved by Council:

- Temporary road closures, such as during spring tides or particularly stormy conditions.
- Lower capacity traffic for a time, such as one lane being closed.
- Changes to the road surface, such as seal being replaced with gravel or bridges with fords.
- Four-wheel-drive vehicles being recommended at times.
- Temporary or permanent heavy vehicle restrictions to limit damage to the road.
- More frequent road maintenance and disruption of traffic.

Screening of adaptation options

After identifying priorities, the next step was to evaluate how coastal hazard risks could be managed through a combination of adaptation options. Once vulnerable assets were identified within each PAL (as described above), the Coastal Panel, STAG, CHAP team and local rūnanga assessed a wide range of potential adaptation options. The long list of adaptation options was taken from the Catalogue of Coastal Hazard Adaptation Options.

Each option was scored based on:

- effectiveness, feasibility and environmental criteria, by the STAG;
- alignment with Council's Guiding Principles (from the CAF), by the CHAP team;
- mana whenua values, by the respective rūnanga; and
- community objectives, by the Coastal Panel.

The process of option screening involved a traffic light scoring system (green, orange, red), whereby each asset in each PAL (roughly 30 assets being planned for) was scored against each of the criteria above, and commentary captured. This method helped remove inappropriate options and identify those worthy of more detailed consideration and assessment during the subsequent stage of adaptation pathway development.

While not described in any detail in this article, the process of developing adaptation pathways saw the inclusion of a broader range of assessment criteria, and in our case the Coastal Panel requested that the STAG provide 'recommended adaptation pathways' as a starting point for them to build from.

Figures 2-5 below illustrate how we progressed from:

1 Option assessment for a specific option in a specific location, to

2 Pathway development, to

3 Visualising the 'future', and finally

4 Situating the pathway within the wider context.

Individual adaptation options were not costed, however, at the pathway development stage the shortlisted combinations of options (pathways) were costed, with a focus on capital cost, but also including consideration for possible operational implications. The costings were added to the assessment criteria used to inform the Coastal Panel's recommended adaptation actions (or preferred pathways).

What next?

Earlier this year, in light of the CHAP team completing the Adaptation Plan for Whakaraupō Lyttelton Harbour and Koukourarata Port Levy, we also undertook a lessons learnt review of the process to identify the areas of strength and the key areas for improvement. This included surveys with the CHAP team, Coastal Panel, Independent Chair and STAG, thematic analysis, workshopping and presentations to various key stakeholders within Council.

One theme that emerged was that the process, while thorough, was perceived as taking too long. Specifically, it was suggested that the asset-specific approach meant that too much time was spent on assets of relatively low importance or priority. We have interpreted this to mean that future processes could de-emphasise those assets of lower priority to facilitate swifter delivery across assets that are determined to be most critical.

Equally however, we note that those 'lower priority assets' are in many cases the assets of greatest interest to the community, such as community facilities and marine infrastructure. We also note that taking time and care with these processes is important, particularly in situations (communities) where trust in council processes is low.

Decisions about what assets to prioritise should be informed by both Council and community input. In future rounds of adaptation planning, we plan to set a higher bar for those assets that will receive targeted (asset-specific) planning, while also exploring efficiencies by planning for broader asset classes, areas or networks in some cases. This would see us reserving asset-specific planning for the situations where it is most necessary.

Changes to the process will largely depend on the selection of the next Adaptation Area, which has yet to be determined. The CHAP team is currently developing options for where adaptation planning should be undertaken next (for Council decision later this year), and is completing further work in preparation for upcoming adaptation planning processes.

Figure 2 (above): An example of road raising, being an adaptation option considered for the roads in Teddington (one of the PALs).

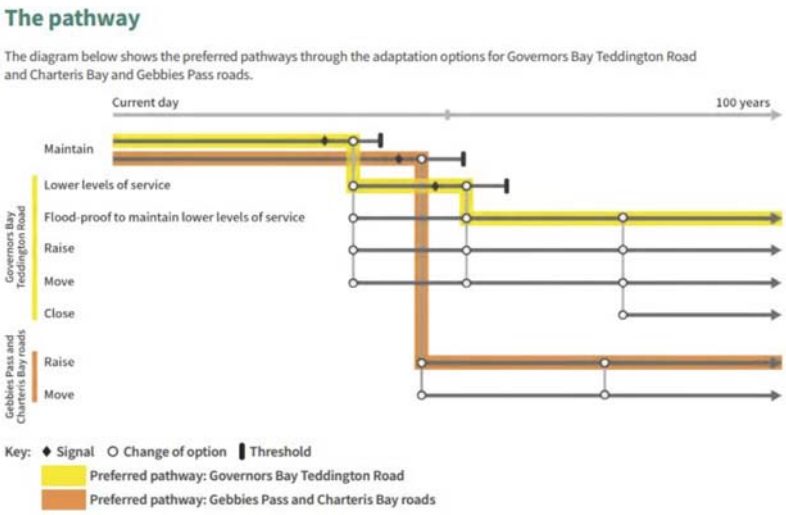


Figure 3 (right): The adaptation pathway developed for the roads in Teddington, showing different preferred options on different parts of the network.

Figure 4 (bottom left): A visual representation of what the roads in Teddington could look like, were the preferred pathways to be implemented.

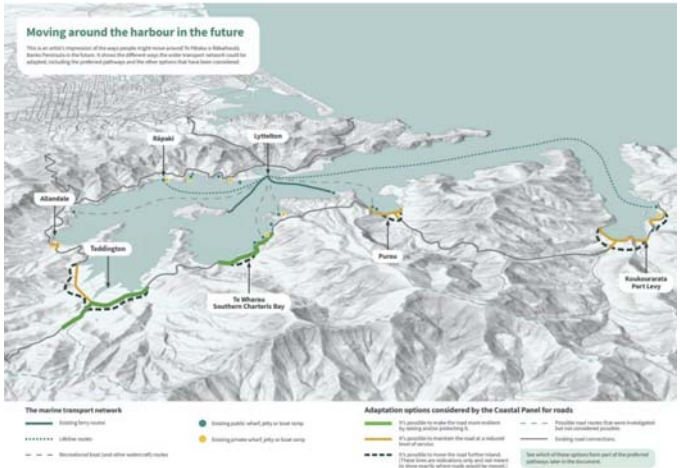


Figure 5 (bottom right): A graphic showing the various roads (and other access connections) being planned for across the Adaptation Area.

Assigning ecological value to marine benthic habitats: An addendum to the EIANZ Impact Assessment Guidelines

Sharon De Luca and Tommaso Alestra, Boffa Miskell Ltd

In 2015 the EIANZ (Environment Institute of Australia and New Zealand) published 'Ecological Impact Assessment: Guidelines for use in New Zealand: terrestrial and freshwater ecosystems' and followed this with a second edition in 2018. Marine habitat was a notable omission from the Ecological Impact Assessment Guidelines, which dealt only with terrestrial and freshwater ecosystems. This new module 'Assigning Ecological Value to Marine Benthic Habitats' is broadly similar to the form of values assessment for terrestrial and freshwater ecosystems; it provides a hierarchy of ecosystem characteristics set against a hierarchy of ecological values ranging from Negligible to Very High values.

In keeping with the structure of the current EIANZ Impact Assessment Guidelines (EcIA) guidelines (2018) for terrestrial and freshwater environments, we developed a set of largely qualitative broad-scale and fine-scale attributes that characterise marine ecological values (for rocky/hard substrate habitats and soft sediment habitats respectively). These value assessments can be applied to different marine habitats to help inform a statement of ecological value.

We initially reviewed available relevant marine classification systems, and existing relevant reports, and summarised the key attributes to form a list of broad-scale and fine-scale characteristics that could be considered in a marine ecology assessment. Early on in the process of developing the Marine Guidelines we involved, and consulted with, a group of marine ecologists from a variety of organisations (not just consultancies).

The draft guidelines were further improved by the expert reviews of our colleagues at Tonkin & Taylor who also put a lot of time into the Guidelines. Once we had a set of attributes and characteristics for both soft shore and hard/rocky shores that we were happy with, we had independent (and anonymous) peer reviews undertaken by New Zealand marine ecology experts in various organisations identified by EIANZ.

An agreed-to set of attributes and values for marine ecologists across New Zealand to refer to will assure decision makers that marine assessments are being consistently approached in a clearly understandable and repeatable manner. We reiterate that the Marine Values Guidelines sit alongside, and do not replace, expert marine opinion and experience, rather that the Guidelines work best hand-in-hand with expert opinion.

The ecological values of marine ecosystems have aspects of both quantity (rarity or extent) and quality (integrity, functionality or condition) and equally the value attributes include both qualitative and quantitative metrics to assign ecological value to the habitats in question.

Broad-scale attributes are:

- Representativeness
- Rarity/distinctiveness
- Diversity and pattern
- Ecological context.

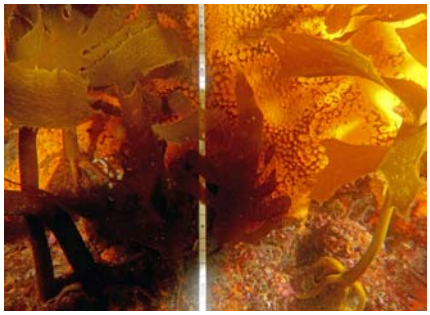
Fine-scale qualitative and quantitative attributes (tabulated into Very High, High, Moderate, Low, Very Low and Negligible values) specific to rocky shore and soft sediment habitats include:

- Substrate type or grain size
- Sediment cover
- Diversity/abundance of infaunal and epifauna invertebrates or sessile benthic organisms
- Sensitive/tolerant taxa
- Invasive taxa
- Biogenic habitat
- Macroalgae/estuarine flora
- Threatened/At Risk species
- Fish community
- Threatened ecosystem
- Habitat modification
- Water quality/sediment quality.

The list of attributes provided comprises a great deal more than may be necessary for all marine ecological assessment projects under the Resource Management Act, but we see the attributes as a solid starting point to consider for any assessment and provided useful baseline for Regulatory Authorities.

Mangroves, south of Whangarei (Photo: Tanya Cook, Boffa Miskell Ltd, 2025).

Te Ara Tupua Project (Photo: Tommaso Alestra, Boffa Miskell, 2025).



Motuotau Reef (Photo: David Culliford, Toi Ohomai, 2025).

For any one project, the ecologist can collate the fine-scale attributes, which are likely to include some of one value and some of other values. The ecologist must use their own expertise to decide what the overall ecological value should be for the project habitat. Generally, the overall ecological value of a project habitat is driven by the proportion of one value category.

For an example from a recent Fast Track Assessment, see Table 1 (note that the actual project name has been replaced with 'Project Site' for this example for confidentiality).

For this project example, overall, given the dominance of HIGH and MODERATE ecological value criteria (for both hard and soft shores), along with a few LOW value ecological criteria, on balance, the marine ecological values were conservatively assessed in the areas potentially affected at the proposed Project Site and the wider Harbour to have HIGH ecological values.

Then the existing EIANZ Impact Assessment guidelines, which can be found on the Institute's website, can be used to determine the Magnitude of Effect of the Project, and then the level of effect for each effect on ecological values.

We understand the list of attributes involves a great deal more than may be necessary for all marine ecological assessment projects, but we see the attributes as a solid starting point to consider for any assessment. The Marine Guidelines were more than five years in the making, and now that they are endorsed by EIANZ, they are available to guide not only marine ecologists, but also decision makers assessing marine ecological reports and undertaking monitoring.

Ecological Value	Criteria / Characteristic / Attribute *(from Marine Guidelines)*	Data Summary
LOW (Project Site) and **MODERATE** (Harbour)	Physical habitat highly modified (Project Site) Physical habitat moderately modified (Harbour)	The Project Site physical habitat has been highly modified by various activities and infrastructure, including a bridge, causeway, marina, and existing reclamations. The wider harbour can be considered modified due to the existing and historic dredging, sedimentation and there being only around 60% of natural coastal edge remaining.
MODERATE (Project Site and Harbour)	Few invasive opportunistic and/or disturbance tolerant species present.	The Asian date mussel *Arcuatula senhousia*, the asicidans *Didemnum vexillu*m and *Styela clava*, and the Mediterranean fanworm *Sabella spallanzanii* are present in the wider harbour.
	Water column contaminant concentrations typically between ANZWQG 90% and 95% species protection levels and/or scored as 'Fair' on a recognised WQI.	Water quality data revealed metal/metalloid estuarine water concentrations were low and below ANZG 99% marine. Sediment from the proposed development soft sediment sites generally have low contaminant concentrations, similar to the wider receiving environment sites. Therefore, the risk of toxicants being entrained in the dredged sediment and leaching into the water column in concentrations above water quality guidelines is very low.
	Few Threatened ecosystems present.	Estuaries are classified as vulnerable ecosystem A2(c) short term decline in ecological function (Holdaway et al., 2012).
HIGH (Project Site and Harbour)	Benthic soft sediment and hard shore community typically has high diversity species richness and abundance, for the habitat type.	Soft Shore The soft sediment marine communities are in a cyclic pattern of recovery, continually reset with dredging. The project site benthic habitat and harbour contain a diverse assemblage of invertebrates, including tolerant and sensitive species. The average Shannon Weiner Diversity Index across the 15 soft sediment benthic tow sites was 2.3, indicating high diversity.
	Benthic invertebrate community contains many taxa that are sensitive to organic enrichment, contaminants and mud.	Benthic invertebrates collected from benthic tows found an abundant and diverse community with sensitive and tolerant species.
	Fish community typically has high diversity, species richness and abundance.	Fish diversity and abundance is as expected for the habitat type in the Harbour and Project Site. There is a consistent and diverse fish population in the Harbour, with the port area supporting significant juvenile and adult fish populations, including eagle ray, snapper, trevally, kingfish, gurnard, kahawai, parore, spotty, and expected diadromous tuna at certain times of the year.
	Marine sediments typically comprise <40% silt and clay grain sizes.	The dominant benthic sediment grain size in the harbour is sand with some fine sediment accumulating in harbour margins in areas of high sediment supply and low wave activity, otherwise sediments generally contain <5% silt and clay.

Table 1: Assessment of existing soft sediment marine ecology against the relevant criteria/attributes assessed at two scales (Project Site and Harbour).

We anticipate that aspects of these Marine Assessments Guidelines will likely evolve over time, as the Guidelines of Freshwater and Terrestrial Assessments have done, in response to changes in the wider environment and increased knowledge on the part of ecologists. We consider this addendum module to be a solid starting point, and a long-needed addition to the practice of marine ecological assessments.

We reiterate that the Marine Values Guidelines sit alongside, and do not replace, expert marine opinion and experience, rather that the Guidelines work best hand-in-hand with expert opinion.

The complete *EcIA Guidelines Addendum | Assigning Ecological Value to Marine Benthic Habitats* can be found on the EIANZ website at: https://www.eianz.org.

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We're looking for a new NZCS Editor

The New Zealand Coastal Society is seeking a freelance editor to lead our flagship publications: *Coastal News* and the biennial Special Publications.

You'll be helping shape the voice of our Society and ensuring that New Zealand's coastal community stays informed, connected and inspired.

This is a paid, flexible role ideal for a freelancer with a passion for coastal issues, strong editorial skills, and the ability to connect with contributors across New Zealand.

What's involved?

- Producing at least two *Coastal News* editions a year;
- Sourcing and editing articles from researchers, practitioners, and regional reps;
- Managing Special Publications that capture major events (e.g. cyclones, significant coastal projects); and
- Collaborating with the NZCS executive and administrators for support.

Recent editions of the newsletter and the Special Publications can be downloaded from the NZCS website at: www.coastalsociety.org.nz/publications. Also available is the *Contributors Guide*, which contains information about the design, layout and content requirements for both publications.

Interested? If so, please email Renee at: nzcoastalsociety@gmail.com.

Linking land, river and moana: Collaborative research between Te Whakatōhea and Lincoln University within the coastal rohe

Richard Morris[1], Shannon Davis[1], Te Kahautu Maxwell[2], Hope Hata[3], Danny Paruru[3], Stuart Charters[1] and Pablo Gregorini[1]

Te Karoro a Tamatea

Te Karoro a Tamatea-Matangi hārō te rangi,

Pākihikura ki uta, Pākihikura ki tai.

Ko Rongo, ka rongo i te kai he pikopiko, he aruhe, he tāwhara kai atua.

E rere te manu i te Raukūmara, ki reira ka kūkū te kererū, kākā te kākā, tūī te tūī, kekā te weka.

E rere rā Waioweka he tuna, he kōkopu, kei runga ko Amokura.

Ka tau taku manu ki te mōmonatanga o te whenua, kai Kiore-Kino, ko te Riu o Kānapanapa, ki Te Houhi he ahuwhenua, he ahu whakamua.

E rere te Ōtāra he matamoe, he īnanga.

Kei runga rā ko Ōparāoa, ko Pāpakanui, kei raro ko Ōtūtaopuku.

Ko te Hikuwai ka kapakapa te ika nui, ka tau ki te ana o Tamaariki ki Te Tirotirohanga a Ngātorohaka ki āna māra.

I whakataukī ai e Tapuikākahu; “Te kai hoki i Waiaua!” Kōeaea, tītīko, pātikitiki.

E rere te Kōtukutuku ki te rae ki Ōpape, he koura, he kina, he toitoi, he tāmure.

Ko ahau ko Tūtāmure ka tutū ngā Tamatea o te Moana ā Toi

Papaki kau ana ki te Koko ki Ōhiwa ko ngā pipi, ko ngā tuangi, ko ngā kuku auē “Ngā Tamāhine a Te Whakatōhea”, “Te umu tao noa a Tairongo. Takahia te kirikiri ko ngā pipi o Waiotahe.

Ka huri taku manu he huringa āhuarangi ki Te Papa ki Amokura, tuia pito ora, he papakāinga.

Ka hoki kē mai te Karoro a Tamatea ki Pākihikura, ki Pākōwhai, ki Ōpōtiki Mai Tawhiti ko te nōhanga tērā o Te Whakatōhea.

"Te toto o te tangata he kai, te oranga o te tangata, he whenua"

Tohe-Ora-Wānanga-Whenua!

E ko, ko, ko ia e ara e! Te manu ka tau!

Tamatea-matangi: The husband of Muriwai.

The seagull of Tamatea-Matangi soars the skies,

The fertile soils are proverbialized here; Pākihikura inland and Pākihikura on the coastline.

Rongo the provider of the edible ferns, and the tāwhara Freycinetia banksii (Pandanaceae) is the fruit of the gods.

The bird flies to the Raukūmara Ranges where the kererū, kākā, tui and weka are numerous.

The Waioweka flows, rich with fish life, above is the pā site of Amokura.

My birds hovers above the pastoral plains at Kiore-Kino, and Riu o Kānapanapa, ki Te Houhi where there is agriculture, and diversification, healthscapes.

Ōtara River is fill with fish types also, up above are the ancient pā sites Ōparāoa, Pāpakanui, Ōtūtaopuku these names are in reference to kai sovereignty.

At the Hikuwai Beach the water is alive with shoals of fish, at Tirohanga is where Tamaariki te kaitiaki lives.

Tirohanga is in reference to the large gardens of Ngātorohaka.

The proverb of Tapuikākahu refers to the bounty of kai at Waiaua, whitebait, tītiko (Amphibola crenata), and flounder.

The Kōtukutuku flows east to Ōpape where there is crayfish, kina, toitoi (shellfish), snapper.

I am the famed Tūtāmure the causes the seas to become boisterous.

Waves crashing at Ōhiwa Harbour, where pipi, cockles and mussels are proverbialized as “The daughters of Te Whakatōhea”. At Ōhiwa the “Cooking fires of Tairongo burn consistently”.

My bird sets flight to Te Papa and back to Amokura here is where landscape architecture and climate change is the focus.

The seagull returns to Pākihikura, to the confluence where the Waioweka and Ōtara rivers meet that encircle Pākōwhai and the capital of Te Whakatōhea, Ōpōtiki Mai Tawhiti.

"While food provides the blood in our veins, our health is drawn from the land"

And a shared vision; Tohe-Ora-Wānanga-Whenua ; Healthscape the new potential!

My bird now ends its flight.

Pākihi: Fertile land (Te Whakatōhea)

Rongo: Rongomātāne, the god of uncultivated kai

Te Papa: The pā site where the former Ōpōtiki Hospital stood. Known as Hospital Hill

Tohe-Ora-Wānanga-Whenua: The concept name for the research collaboration that celebrates Mātauranga Māori & Western Sciences.

A pātere is an ancient genre within the Māori repertoire of song styles. Its function is to take the listener on a metaphoric journey across the land, identifying geographical features of significance that connect deeply to the theme of the song. In this context, the pātere seeks to promote the content of this article, which highlights the research collaboration between Te Whakatōhea iwi, Lincoln University, and Waikato University. Central to this work are the themes of *kai* sovereignty, climate change, and integral health farming.

1 Te Whare Wānaka o Aoraki Lincoln University, Center of Excellence Designing Future Productive Landscapes

2 Te Whare Wananga o Waikato

3 Te Tāwharau o Te Whakatōhea

Our collaborative research story

In the eastern Bay of Plenty, where the land yields to the Pacific and the Waioeka and Ōtara Rivers meet Te Moana a Toi (the Bay of Plenty), a research partnership is flourishing between Te Whakatōhea iwi, Lincoln University Centre of Excellence Designing Future Productive Landscapes (DFPL), and Waikato University. This collaboration has grown over several years into a suite of multidisciplinary research projects focused on agricultural systems design, urban planning, and climate resilience. While distinct in their objectives, these research threads are united by a deeper, unavoidable theme: the interconnection between whenua (land), awa (river), and moana (sea). For Te Whakatōhea, these are not separate domains but a continuous space of identity, sustenance, and economy, an ethos that sits well with DPFL.

The contemporary commitment of Te Whakatōhea to integrated land-sea stewardship has deep roots, grounded in a legacy of entrepreneurial leadership stretching back throughout their history.

One such leader was Hira Te Popo of Ngāti Ira, a hapū of Te Whakatōhea, whose economic success in the mid-19th century was based on the establishment of extensive wheat cultivations on the fertile Waioeka flats near Ōpōtiki and the development of a flour mill[1]. Recognising the importance of controlling supply chains, he and his iwi acquired schooners and cutters to transport produce to the Auckland market. By the 1860s, Te Whakatōhea owned or operated between 19 and 22 ships representing a significant portion of the national fleet at the time[2].

This golden era of agriculture and economic independence was ended by the Crown's confiscation of Te Whakatohea land, commencing in 1865. By the following year, its commercial infrastructure was destroyed and over 58,000 hectares of Whakatōhea land were confiscated – including its most productive soils. The iwi was largely sequestered to the marginal lands of the Ōpape Native Reserve, a coastal area of around 8,200 hectares stretching from Ōpape to Ōmarumutu. Today, travellers may recognise Ōpape as the coastal settlement that marks the end of Te Moana a Toi before the road turns inland toward East Cape. It was here, on this land of both dispossession and resilience, that the collaboration between researchers from Lincoln University and Te Whakatōhea began.

An initial project gathered oral histories from kaumātua who had grown up on the Ōpape Reserve. These interviews revealed a deeply ingrained ethic of kai self-sufficiency, seasonal knowledge, and community-based resource distribution. This foundational research laid the groundwork for a funded project exploring whenua planning for kai security in and around Ōpōtiki township.

Kai Whakakitenga-nui o Te Whakatōhea: Whenua planning for kai security

Supported by both the Ministry of Business, Innovation and Employment through the Te Pūnaha Hihiko: Vision Mātauranga Capability fund, and Toi Moana Bay of Plenty Regional Council Community-Led Adaptation fund, this project was developed based on the strategic vision established in the Te Whakatōhea Iwi Kai Strategy (2022) commissioned in response to COVID-19.

Serving as a call to action to support a shift of whānau, hapū, iwi from a state of food insecurity and dependency to food security and sovereignty, this project is a step in visioning and planning whenua systems for increased assess to local kia for Te Whakatōhea whānau by integrating local kai production and access as critical urban components of Ōpōtiki.

Focused on both short term (1 to 10 years) and longer term (60+ years) spatial planning strategies, the research soon highlighted the projected impact of environmental change due to climate dynamics on the landscapes within the Te Whakatōhea rohe and it became clear that the relationship between whenua, awa, and moana could not be separated when considering kai security.

Figure 1: Whenua planning design wānanga, August 2024 (Photo: Mo+Co).

One senior kaumātua interviewed emphasised long-standing concerns about sedimentation where the Waioeka and Ōtara Rivers enter the Bay of Plenty – a process accelerated by decades of land-based activities upstream. These observations resonated strongly with the current environmental challenges facing the region and formed the focus of a second whenua planning project, outlined below.

Ka Mate Kāinga Tahi Ka Ora Kāinga Rua: From adversity arises the opportunity for change

A case study of iwi-led long-term whenua adaptation planning in response to climate change

The second project applies a Te Whakatōhea perspective to the future urban design of Ōpōtiki township in light of sea level rise and flood risk. It considers how the transition of floodplain lands into productive wetlands might allow for both ecological restoration and continued human habitation.

These projects are not only technical in nature, they seek to re-centre Indigenous knowledge and authority in spatial planning, climate adaptation, and ecological design. For Te Whakatōhea, this is not a return to the past but an investment in the future – one rooted in deep-time relationships with land and sea. In partnership with DFPL, they are actively reimagining the contours of settlement, economy, and environmental care in Te Moana a Toi.

Integral health farming: Te Whakatōhea dairy farm

The other key research project currently underway is located on the Te Whakatōhea Dairy Farm, looking at how, amongst other things, vegetation (such as constructed wetlands, riparian buffers, on-farm patches including rongoā and medical species, and shelterbelts) can be integrated into the dairy platform to improve water quality and modulate peak river flows.

This work is situated in the Waioeka River catchment and therefore impacts downstream sediment loading and water entering the moana. Additionally, one of the

1 Walker, R (2007). *Opotiki-Mai-Tawhiti: Capital of Whakatohea*. Auckland, NZ: Penguin Books.

2 Te Tāwharau o Te Whakatōhea, & The Crown (2023). *Whakatōhea deed of settlement of historical claims*. New Zealand Government.

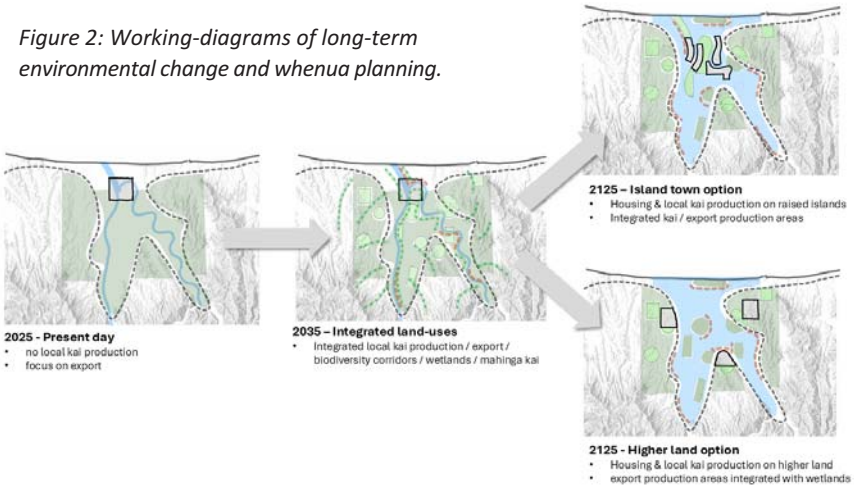

Figure 2: Working-diagrams of long-term environmental change and whenua planning.

goals of phase two of this project seeks, through a new design implementation, to understand impacts on vegetative biodiversity, habitat and the wellbeing of livestock through vegetation and forage diversity.

Figure 3: Kaumātua Julie Lux showing researchers her whānau whenua.

In an age of rising seas and fractured food systems, such place-based collaborations offer lessons far beyond Ōpōtiki. They remind us that resilience lies not in technical fixes alone, but in the integrity of relationships: between people and whenua, awa, moana – and with one another.

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Navigating the future: Reflections from Coasts & Ports 2025 in Adelaide

Ryan Abrey, NZCS Treasurer & Membership Coordinator

The 2025 Coasts & Ports Conference was held from 18–21 August at the Adelaide Convention Centre, South Australia, under the theme '*Navigating the future: Climate ready coasts and ports'*. With over 508 delegates in attendance, the event showcased the vibrancy and innovation of the coastal and port engineering community across Australasia and the Pacific.

The conference featured a pre-conference Short Course and workshop, 170 technical presentations, three technical tours, and a well-curated programme that highlighted cutting-edge research, practical case studies, and emerging trends in climate adaptation, infrastructure resilience, and coastal science. Under the capable leadership of Conference Chair Paul Constance, and in partnership with Engineers Australia and PIANC, the event ran seamlessly and was widely praised for its organisation and impact.

Among the standout keynote presentations were:

- Justin Cross on maritime infrastructure challenges and opportunities in the Pacific Islands and Southeast Asia.
- Michael Arman presenting *SA climate ready coasts: Accelerating coastal hazard adaptation*, which resonated strongly with local government and practitioners.

A particularly engaging panel discussion on Local Government SA Climate Ready Coasts sparked robust dialogue around accelerating hazard adaptation and community engagement.

Aotearoa New Zealand was well represented, with a strong contingent of speakers and attendees contributing to the technical programme. Notable presentations included:

- Michael Payne – *Rocks versus blocks;*
- Reza Shafiei – *Waitaki District coastal management;*
- Jennifer Hart – *Wellington International Airport sea defences renewal – southern seawall option review;*
- Ashishika Sharma and Cathy Bebelman (Auckland Transport) – *Coastal resilience and adaptation action plan;* and
- Colin Whittaker – *Evaluation of repair methods for damaged rock armoured slopes.*

Some thoughts from our kiwi attendees:

> "The 2025 Coasts & Ports Conference in Adelaide was the best yet for me, with nearly 500 attendees from Australia, New Zealand, and the Pacific. Super interesting insight on work happening around the AS/NZ and the Pacific. Inspiring sessions on climate resiliency (special mention to Tom Shand's powerful atoll nations talk) and great networking, all seamlessly organised. Adelaide delivered too: koalas, fantastic food, great coffee, AFL, and nightlife! Roll on Wellington 2027."
>
> *Jonathan Stewart*

> "The Coasts and Ports conference was a great opportunity to connect with the technology and coastal protection works across Australasia. AT appreciated the opportunity to share our work and get feedback on our approach."
>
> *Cathy Bebelman (AT)*

Reza Shafiei and Jennifer Hart highlighted the breadth of technical streams and organisational representation as well as the valuable updates from PIANC working groups, reinforcing the strength of regional representation.

Looking ahead, as part of the conference closing remarks, Ryan Abrey proudly announced that the next Coasts & Ports Conference will be held in Wellington, New Zealand in 2027. This marks an exciting opportunity for New Zealand to host the region's premier coastal and port engineering event, continuing the legacy of collaboration and innovation.

The connections made over coffee chats (or a glass of wine), bumping into old colleagues from all over the world, and insights learnt from the presentations are all invaluable and inspired all of those who attended. Congratulations to all of those involved in this year's conference for putting on a fantastic event and many thanks to all sponsors, trade displays and presenters.

AUSTRALASIAN COASTS & PORTS 2027 Wellington

University news: Celebrating our recent graduates

The Society would like to congratulate our recent coastal graduates, and we have asked four of them to tell us about their research, their interests, and what they intend to do in the future. If you know of any recent graduates you would like to see profiled in *Coastal News*, please contact Sophie Horton (University & Education Coordinator) or the Editor – contact details are on page 11.

Vicky Short

University of Auckland, Supervised by Dr Emma Ryan

Like many Aucklanders, I've long enjoyed visiting the Coromandel during the summer. Over time, I noticed the ongoing dune degradation at Pauanui Beach and, more recently, the restoration efforts that began in 2021. Inspired by these changes, my Master's thesis examined projected shoreline and dune retreat at Pauanui, with a focus on how vegetation restoration efforts influence long-term dune toe stability. Using the SPADS data-driven model, I assessed shoreline movement through to 2100 and evaluated three dune management scenarios: no management, conservative restoration (representative of current efforts), and moderate restoration (representative of additional restoration works).

The results indicated that while restoration can provide roughly an additional decade of resilience, it alone is not enough to prevent long-term property encroachment. My work proposed a revised Shoreline Adaptation Management Pathway and highlighted the need for integrated strategies to strengthen coastal resilience at Pauanui Beach.

Since finishing my thesis in February, I've joined Haskoning New Zealand as a Graduate Environmental Consultant. I've had the incredible opportunity to work with a tight-knit team on coastal adaptation projects across Aotearoa and the Pacific. One highlight so far has been travelling to Tuvalu to support the social and environmental safeguards team working on the Outer Island Transport Project on the islands of Nuitao and Nukalaelae.

Pauanui Beach dune restoration efforts.

As I begin my career, I'm excited to keep building my experience in the coastal field and to contribute to the passionate community working to support and sustain New Zealand's coastlines.

Alaina Baker

University of Canterbury, Supervised by Dr Sarah McSweeney and Professor James Brasington

Alaina's thesis integrated deep learning (CNNs and ANNs) into remote sensing for monitoring coastal lagoon (hāpua) morphodynamics using high-frequency, low-cost CubeSat imagery. This study successfully extracted water masks and quantified key geomorphic parameters such as surface water area, mouth width, and entrance orientation. The findings reveal significant variations in hāpua morphology over time, such as water surface, mouth width and opening orientation. Geomorphology results suggest that the Rangitata hāpua has a scaling relationship between tidal prism and inlet cross-sectional area, differing from established estuarine models. This challenges existing classifications of hāpua systems and calls for further research into hāpua dynamics.

The deep learning model performed well when trained with mosaic tile sizes of 10 by 10 pixels, and when the CNN model is trained with 90 scenes. However, the study also highlights the necessity of localised model training due to the spectral and geomorphic uniqueness of hāpua within Canterbury. Overall, Alaina's thesis highlights the potential of deep learning for region wide coastal monitoring. This method of monitoring provides a scalable, fast, and cost-effective alternative to traditional field-based measurements at a near real-time scale. The findings of this study contribute to both the theoretical understanding of hāpua processes and the development of practical tools for coastal monitoring and conservation.

Alaina Baker, in the field.

Thank you to the NZCS for funding this research! Alaina is now working as a Geospatial Research Associate with the University of Canterbury Lidar team in Waterways. Please feel free to reach out to Alaina.baker@canterbury.ac.nz

Myu and Bernadette

University of Auckland, Supervised by Dr Colin Whittaker

In 2024, Myu and Bernadette completed their Honours research project under the supervision of Dr Colin Whittaker. The project was a highlight in their final year of university, where they were granted the opportunity to present their findings at the New Zealand Coastal Society Conference, where they won the Best Student Oral Presentation Award.

The aim of the project was to analyse data to determine the responses of beaches in Auckland to the wave climate, storms, and decadal climate patterns. The study focused on Takapuna Beach with data gathered from Auckland Council's coastal monitoring programme and wave hindcast models. Profile and camera data analysis showed different behaviours for two specific storm events on Takapuna Beach. During Cyclone Gabrielle, the beach experienced overall accretion and a large increase in beach volume while Cyclone Lola saw beach steepening but little impact on beach volume. While the specific local drivers that triggered

Myu and Bernadette with Colin Whittaker.

anomalous beach behaviour were ultimately still uncertain, the research presented an opportunity for a wealth of future work with the Auckland Council coastal monitoring dataset. The next steps for this research could include extending the research to more beaches and incorporating data such as satellite-derived shorelines and water levels.

Since presenting this research at the New Zealand Coastal Society Conference in 2024, Bernadette and Myu have both graduated from the University of Auckland and are now working in roles within the water engineering industry. Bernadette is a graduate engineer at HAL Consulting, currently working on projects related to three waters management involving hydraulic modelling, growth capacity assessments, and strategic planning. Myu is a graduate civil engineer at Jacobs, working on stormwater infrastructure projects involving inspections of stream and coastal outfalls, asset upgrades/maintenance and managing overland flow paths in local areas of Auckland.

NZCS News

New NZCS membership category

NZCS are launching a new Membership Category, one for Emerging Career Professionals. This membership category is for individuals with less than five years of experience post completion of their undergraduate or postgraduate degree. It's designed to support their early career development in disciplines related to the coastal environment.

By becoming an Emerging Professional member, not only do you get access to all the comprehensive benefits of full membership, but you will also have the opportunity to engage with our NZCS emerging professional initiatives, with mentoring and networking opportunities all tailored to benefit and support you as you start your career.

Cost

The Emerging Professional membership of the New Zealand Coastal Society has the following fee structure:

- 50% off your membership for the first three years ($52.50 + GST annually)
- Full price membership (but maintaining all the emerging professional benefits) for the final two years ($105 + GST annually).

Please note that the discounted membership rate is a special offer from the Society to encourage early career participation.

We hope that Emerging Professional members will continue as individual members after enjoying the initial beneficial period, thereby maintaining and growing their interest in coastal environments. When your Emerging Professional period has ended you will automatically be transferred to an Individual full membership.

Note that Emerging Professional Members enjoy all the benefits and rights of full membership, including voting rights.

Benefits

- Opportunities to engage with Emerging Professional initiatives such as mentoring, networking with other emerging professionals as well as seniors in your chosen field.
- Subscription to the weekly NZCS email digest, which regularly details coastal talks and other workshops, courses and conferences, job opportunities, and resources.
- One copy of the Society's professional publication *Coastal News* published three times per year in March, June and November.
- One copy of the *Coastal News Special Publication* issues published approximately every second year.
- Invitation to attend the Eric Verstappen Young Professionals Breakfast as part of our annual conference (see more information at https://www.coastalsociety.org.nz/about-us/eric-verstappen-young-professionals-breakfast).
- Membership and attendance at regional branch meetings, workshops and events.
- The chance to get your research published in the Society's professional publication *Coastal News*.
- Eligibility to apply for the NZCS awards. Visit the Awards Page at www.coastalsociety.org.nz/awards for more information.
- Listing in the NZCS Member Directory.

If you are eligible and interested in transferring your membership over, email us at nzcoastalsociety@gmail.com and provide us with your study end-date.

Please share this new membership category with any potential graduates or early career colleagues within your organisation.

NZCS PDA award 2025

Congratulations to Milly Grant Mackie and Akuhata Bailey-Winiata for winning our Professional Development Award for 2025.

Milly is an emerging Māori researcher at the University of Auckland with developing expertise linking Matauranga and physical science knowledge in the key strategic area of coastal change under sea-level rise.

Akihata is a Climate and Natural Hazard Scientist at PDP whose work exemplifies the integration of technical excellence, mā tauranga Māori, and meaningful community engagement.

NZCS Student research scholarships 2025

Māori and Pacific Islander scholarship: Preston Maluafiti (University of Otago) – 'Bioactive variability of *Undaria pinnatifida* across space and time in East Otago'.

PhD scholarship: Eduardo Basquin (University of Auckland) – 'Understanding the impact of changing sea-level on estuarine open coast sediment exchange in New Zealand'.

MSc scholarship: Rose Somerville (University of Otago) – 'Battling the sands of time: An assessment of the threats, vulnerabilities, and restoration potential of pikao (*Ficinica spiralis*) in Ōtākou (Otago)'.

Look out for a feature on our three award winners in the next issue of Coastal News, along with some more details about their research projects.

News from the regions

Auckland

Lara Clarke, Matthew McNeil and Sage Vernall, Regional Representatives

Shoreline adaptation plans

Over the last four years, Auckland Council has been progressing the development of Shoreline Adaptation Plans, which look at how council-owned assets and land can be managed in response to coastal hazards and a changing climate over the next 100 years. Auckland Council has developed, finalised and approved Shoreline Adaptation Plans for most of Auckland's coastal areas. Each plan focuses on a different area of Auckland's shoreline, with 11 plans approved in the last few months bringing the new total to 18 approved plans.

The Shoreline Adaptation Plans confirmed this year include the coastline of the Waitemāta Harbour West, the Tāmaki River Inlet (Estuary), and east coast from Highbrook to Whitford and northern-eastern areas from Pākiri to Mathesons Bay Te Kohuroa, Ti Point to Sandspit, Snells Beach to Ōrewa, and the Weiti Estuary to Devonport Peninsular. In the west this includes Whatipu to South Head, the Kaipara Moana and the Manukau Harbour North. A plan has also been confirmed for Aotea Great Barrier and the Outer Hauraki Gulf Islands. Development of the plans has included over 100 engagement events technical inputs from a range of technical specialists, mana whenua and communities.

Coastal monitoring portal

Auckland's coastal monitoring data is now publicly viewable on Auckland Council's newly launched Coastal Monitoring Portal (https://coastalmonitoringac.netlify.app). This means that Aucklanders can now access data like sand levels, coastal camera imagery, and wave and water levels at key Auckland beaches.

Plan change for natural hazards

Auckland Council's Policy and Planning Committee have approved the withdrawal of Plan Change 78 and the replacement of this with a new plan change for Aucklanders to have their say on, through public submissions. The new plan change, Plan Change 120, will introduce stronger rules to steer buildings away from high-risk areas for flooding, coastal erosion, and inundation. This includes more restrictive consenting rules for new builds and, in the worst affected areas, limiting development to single houses. For more, see https://ourauckland.aucklandcouncil.govt.nz/news/2025/09/what-you-need-to-know-proposed-changes-to-auckland-s-planning-rules/

Waikato

Jamie Boyle, Joshua Sargent, William Dobbin and Celeste Davies-Calway, Regional Representatives

Coastal inundation tool updated

The Waikato Regional Council has updated its Coastal Inundation Tool. The tool is intended to be used by the public and local government as a 'conversation starter' to explore susceptibility of coastal inundation at a regional scale. The tool uses a simple 'bathtub' model to show 'static' water levels. There are no fundamental changes to the purpose of the tool and it has a similar look and feel, but with some small functionality changes. Key updates are the new coastal inundation data and sea level scenario points within the tool. The new coastal inundation data now covers all of the Waikato Region using newly available LiDAR data, including inland areas of the Lower Waikato River and all of the west coast. The sea level scenario data has been updated based on the 2024 NIWA sea level analysis report, which will be released shortly.

We would like to thank Bay of Plenty Regional Council for collaborating and working closely with us on this project – we managed to complete this project all through internal resources from both councils.

The launch page for the Coastal Inundation tool can be accessed at:https://www.waikatoregion.govt.nz/services/regional-hazards-and-emergency-management/coastal-inundation-tool/

Bay of Plenty

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

Local get together

The Tauranga Moana chapter of NZCS hosted a casual get together on August 7th at the Beca office to stream PIANC's Port Construction in New Zealand and the Pacific's webinar. The session featured presentations on the PMNZ Floating Tug Berth in the Marlborough Sounds and the Vanuatu Wharf in Port Villa. It was great to hear about innovation happening here in Aotearoa New Zealand combining off-the-shelf products with bespoke components to tailor solutions that meet the demands of temporary tug berthing in the Sounds. The Vanuatu session highlighted the range of challenges – with procuring specified materials, encountering fossilised giant clams which severely damaged steel piles, and navigating impacts of an earthquake – during construction.

It was great to get a small Bay of Plenty cohort together for some whakawhanaungatanga and kai before the webinar, and we look forward to getting together again later this year – watch the weekly updates for upcoming events!

Taranaki

Sam Dixon, Regional Representative

New walkway and bridge opened

The Te Ara Tahuri Hau (pathway of wind changes) walkway and bridge, near Ōākura in Taranaki, officially opened in June. The completed project, which cost approximately $2 million (including $440,000 from Waka Kotahi), was a collaborative effort led by the New Plymouth District Council, mana whenua (Ngāti Tairi), and the Kaitake Community Board.

While offering spectacular coastal views, the new walkway also ensures protection for the Hauranga Pā site, historically one of the largest pā in the Tataraimaka district, which holds deep cultural and historical significance to Ngāti Tairi. Ngāti Tairi and Ngā Mahanga hapū raised concerns, supported by

archaeological reports, that the site was being damaged by informal walking and cycling trails that had developed over time. This heavy use was compromising the archaeological features of the wāhi tapu site. The design of the new bridge and pathway was specifically crafted to provide a safe and scenic route for locals and visitors, while still respecting the integrity of the ancient pā.

The project's scope addressed several needs:

- Site protection: A rock revetment was constructed to support the Te Ara Tahuri Hau walkway, actively protecting the wāhi tapu site from further erosion and damage, and allowing access around the headland even at high tide.
- Infrastructure replacement: The project included a crucial replacement footbridge over the Whenu Ariki Stream, which had been destroyed during ex-tropical Cyclone Dovi in 2022.
- Pathway design: The new route maintains the popular link for walkers and cyclists between the Timaru and Whenu Ariki streams. Crucially, the new shared pathway includes a restriction– cyclists must walk their bikes through the area for the safety of other users and to prevent any risk to the site's archaeological features.

The construction process faced a tight schedule to work around penguins and other wildlife during nesting seasons, reflecting the project's commitment to the sensitive coastal environment. Furthermore, the ramps and handrails on the new bridge were built with the help of seven Taranaki students participating in the 'Build a Bridge' training programme – a partnership designed to give teenagers valuable job skills and an option for a future in the building industry.

Wellington

Greta Stuthridge and Michael Paine, Regional Representatives

Curious visitor inspects coastal barrier restoration

We had spotted a Wellington local, a baby seal, lounging contentedly on the newly upgraded rock revetment in front of Frank Kitts Park, basking in the morning sunlight that shone across Wellington's waterfront. The seal, a curious and unexpected visitor, seemed to approve of the recent improvements to the 190-metre-long coastal barrier that stretches from Whairepo Lagoon to the TSB Arena. This vital structure, originally built in the late 1960s, had recently undergone a careful restoration to address decades of wear and erosion. The project, timed to avoid disturbing the local kororā/little penguins, involved reinforcing the rock wall with concrete pours and installing artificial burrows to support penguin nesting.

As the seal nestled among the freshly placed rocks, passersby paused to admire the scene, a reminder of the delicate balance between urban development and wildlife conservation. The upgraded revetment not only protects the city from coastal erosion but also offers a safer, more resilient habitat for marine life, making moments like this possible.

Seal inspection, Wellington Harbour (Photo: Ryan Abrey).

NZCS and GSNZ presentation

The NZCS Wellington was proud to partner with GSNZ to sponsor the pre-lecture catering at their recent monthly lecture, which featured a compelling presentation on the Te Ara Tupua Coastal Pathway. Delivered by Michael Paine (Wellington Regional Rep), Andrew Kennedy, and Sam Fox of the Te Ara Tupua Alliance, the talk explored the physical and technical challenges of constructing the 4.5 km shared pathway between Nga Uranga and Pito One. The project, which enhances transport resilience and safety along the Te

Scenes from the Te Ara Tahuri Hau walkway opening day, 16 June 2025 (All photos: New Plymouth District Council).

Whanganui-a-Tara coastline, includes innovative coastal engineering solutions such as the X-BlocPlus revetment armour. NZCS is pleased to support events that promote knowledge-sharing and highlight the importance of resilient coastal infrastructure in Aotearoa.

NZCS/GSNZ joint event in Wellington, June 2025 (Photo: Ryan Abrey).

Tasman/Upper South

Bryan Scoles, Regional Representative, and Harry Allard, Nelson City Council

Wave buoy deployed

The Tasman District Council (TDC) and the University of Canterbury (UC) partnered to deploy a Spotter wave buoy offshore from Abel Tasman National Park in March this year. UC supplied the buoy, while TDC managed its deployment, maintenance, and communication costs. This buoy has since provided valuable, reliable, real-time data.

This real-time data proved critical during two major storm events in June and July that caused large-scale regional flooding. During these storms, peak significant wave heights reached 3.74 metres. While the first storm had a limited storm surge, the second recorded a peak storm surge of 0.73 metres. Fortunately, the combined effects on the upper shoreline were less severe as the surge coincided with mid-tide. The buoy was an excellent resource, enabling effective decision-making during these events.

The region experienced two large, rapid-succession flood events, with the Motueka River reaching its highest flows since the 1800s, and several other rivers also hitting record highs. The short interval between floods likely meant the second event transported a significantly greater volume of sediment and debris to the coast due to extensive areas of exposed riverbanks.

These sediment-laden flows entered Tasman and Golden Bays, potentially causing ecological impacts to benthic communities. Furthermore, large quantities of debris, including silage bales, apple bins, and woody material, were carried to the coast. This required substantial effort from the Tasman Harbourmaster to clear the material posing a risk to navigational safety.

Nelson Haven/Paruparuroa estuary and Waimea Inlet (co-managed with TDC) are two of the four estuaries monitored by Nelson City Council (NCC) using methods informed by the National Estuary Monitoring Protocol (NEMP).

To better understand how land management impacts estuary health, NCC commissioned DHI to develop a CREST model tool for Nelson Haven in 2023 2024. This tool was designed to model the connectivity between the Haven's sub-catchments and the transport of sediment and nutrients via waterways.

The model drew on various data sources, including NCC's State of the Environment monitoring, rainfall data, CLUES model river loads, and Port Nelson current meters. To inform the hydrodynamic model, NCC's Science and Harbourmaster teams collected ADCP data across a full tidal cycle using a SurfBee unmanned surface vehicle.

The final CREST tool allows users to run scenarios simulating hypothetical changes to contaminant loads from specific sub-catchments and model their impacts throughout the estuary. It also provides fine-scale results for suspended sediment, deposition, and short residency time sedimentation. NCC's projected uses include:

- Modelling impacts of major earthworks and designing monitoring.
- Designing monitoring programmes following extreme weather events.
- Prioritising catchment remediation options (e.g., reducing sediment deposition on specific seagrass beds).

The successful development of this customised CREST model demonstrates that this advanced monitoring approach is a valid and achievable option for smaller regional and unitary councils.

Interested parties can contact Harry Allard (harry.allard@ncc.govt.nz), Coastal and Marine Scientist at Nelson City Council, for project reports or to run scenarios.

Canterbury

Kate MacDonald, Tommaso Alestra and Jessica Green, Regional Representatives

Canterbury team event

Back in the depths of winter, the Canterbury region heard from the Christchurch City Council about their recently approved Coastal Hazards Adaptation Plan for Whakaraupō Lyttelton Harbour and Koukourarata Port Levy. The CCC Coastal Adaptation team shared their experience developing the plan over the past few years. For those that are unfamiliar, the plan focuses on six coastal communities where coastal hazards impacts have been projected to be most significant. Pathways were then developed for managing vulnerable public assets over the next 100 years.

The adoption of the plan marks a shift from planning to implementation. The next steps for the CCC Coastal Adaptation team include work to develop a monitoring framework and to clarify the roles that local, regional, and central government will play moving forward. This event was a great chance for those in the region to keep up to date with key events as well as catch up with peers after a whirlwind start to the year!

NZCS archives & downloads

The NZCS website houses an extensive archive of the Society's activities from its inception, including:

- **back issues** of *Coastal News* (1996 to date) and **'hot topic' reprints** of significant articles from previous issues;
- newsletter **author and article indexes** from issue 1 to date (updated yearly);
- an **author's guide** to writing articles for *Coastal News* and NZCS special publications;
- a selection of **webinars**, **videos** and **presentations** on topical coastal issues; and
- copies of the six completed **NZCS Special publications** (published 2014-2025).

All these and more can be accessed at https://www.coastalsociety.org.nz under the 'Media>Publications' tab on the main menu.

NZCS Science and Technology Fair sponsorship winners

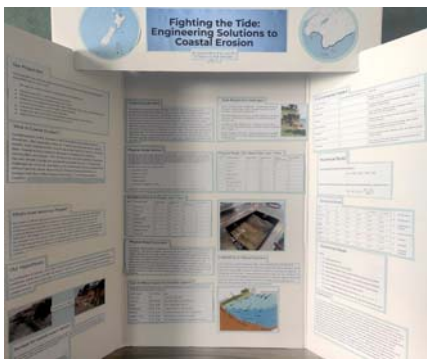
As part of its ongoing commitment to fostering coastal science education, the New Zealand Coastal Society proudly sponsored Special Prizes at three Science and Technology Fairs during 2025, aimed at recognising projects that exemplify the Society's core values—sustainability, innovation, and relevance to New Zealand's coastal and marine environments. These values serve as the guiding criteria for selecting winners, ensuring that awarded projects not only demonstrate scientific rigour, but also contribute meaningfully to the understanding and stewardship of our coastal ecosystems.

The 2025 NIWA Science and Technology Fairs were held in Wellington, Auckland and Southland. The winners of the NZCS Special Prizes for each region are given below. In each case, they were deemed to reflect the NZCS principles through thoughtful analysis, creative problem-solving, and a clear connection to real-world coastal challenges.

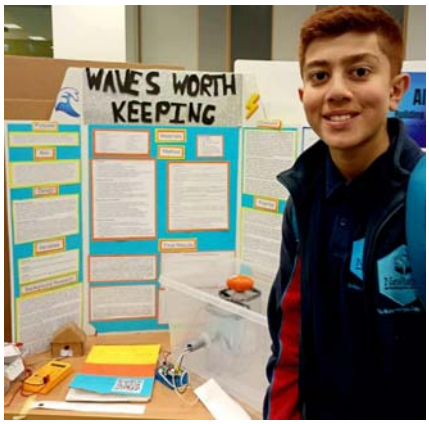
Wellington

There were two awards made at the NIWA Wellington Science and Technology Fair: David de Bruin and Lucas Ng (St Patrick's College), for their project 'Engineering solutions to coastal erosion in New Zealand', and Purav Joshi (Newlands Intermediate), for his project 'Waves worth keeping: Powering the Future'.

David and Lucas built a wave tank model and conducted field research at Wellington beaches to study coastal erosion and compare protection methods. Their project assessed the effectiveness, economic viability, and environmental impact of engineered defences versus natural solutions to identify sustainable ways to protect New Zealand's coastline from rising sea levels.



Purav's project focused on wave energy as an underused renewable resource, addressing the limitations and safety issues of the associated energy storage. He developed a small-scale prototype combining an electromagnetic induction generator and submerged, biodegradable hydrogel batteries, to demonstrate a potential low-cost, safe, and clean energy solution for coastal and island communities.



Auckland

NZCS also sponsored the NIWA Science and Technology Fair for Central and West Auckland which was a vibrant celebration of creativity and scientific curiosity, with students presenting an impressive array of innovative projects across a wide range of disciplines.

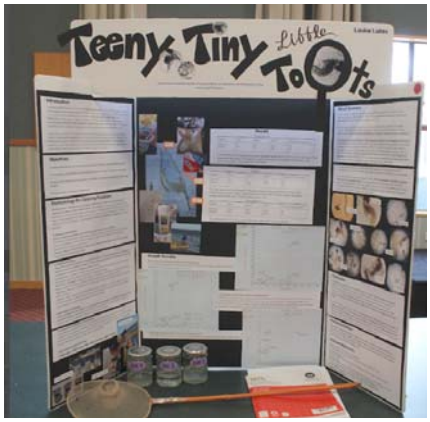
Projects presented highlighted a strong focus on real-world problem solving, emerging technologies, environmental stewardship, and inventive experimentation. There were multiple students awarded the NZCS sponsored award this year which aimed at projects that aligned with NZCS's mission and values. These were:

- Mane Chaudnary and Kiran Treanor from Lynfield College with their project 'What a waste';
- Kieran Lightbody from King's School with their project 'Magnet Vs microplastic' investigating which oil-based ferrofluid is best to remove microplastics from water;
- Lia Son and Kavya Sri Boddapati from Epson Girls College with their project 'Nature's water filter'; and
- Siobhan Murphy from St Cuthbert's College with their project 'Orakei Ngutuawa – Stay Away?'

The projects recognised this year demonstrated both ingenuity and rigorous scientific thinking, reflecting the high calibre of young talent within our region.

Southland

The winner for the best exhibit relating to marine science at the NZAS Southland Science and Technology Fair, and the NZCS award, was Louise Lubos from Verdon College for her project 'Teeny tiny little toots', which looked at zooplankton in the Invercargill Estuary. Her study looked at the amount of zooplankton present in relation to pH levels, temperature and depth, and the comparison between summer and winter.



Congratulations to this year's winners, whose projects exemplified the NZCS values of sustainability, innovation, and relevance to New Zealand's coastal and marine environments. The calibre of entries was truly inspiring, reflecting a deep curiosity and commitment to solving real-world environmental challenges. The passion and ingenuity on display offer great hope for the future of coastal science and engineering in Aotearoa.

For full results and more about the 2025 events see:

- www.scifair.org.nz/results.html (Auckland)
- sciencefair.org.nz/results/results-for-science-fair-2025 (Wellington)
- www.southlandsciencefair.co.nz/prizelist.php (Southland).

News in brief

It's been a while since we last reported from the on-line world, and since then a myriad of stories and articles relevant to coastal matters have popped up. Obviously, we can't report on all of them, so here's a selection of items that caught the Editor's eye…

Research studies

There are no shortage of articles that discuss the impact of climate change on coral reefs, but not many can be said to present an optimistic outcome. However, a recent study from the University of Colorado Boulder offers, perhaps, a ray of hope, suggesting that corals could be more resilient than once believed. The study found that despite a gradual increase in ocean acidity levels over the past 200 years, some corals seem to be able to adjust and to regulate the mechanism they use to build and maintain their skeletons. The authors note that while this is an unexpected and hopeful signal, it needs more long-term data to understand what it really means. For a summary of the research see https://www.colorado.edu/today/2025/09/30/corals-might-be-adapting-climate-change.

'The coastline is not a canvas for our extravagant signatures' – so concludes a recent article published in *The Conversation*. Written by a visiting researcher at the University of Southampton, it discusses the striking global proliferation of artificial coastal developments – resembling luxury logos and in unusual shapes – and highlights the environmental and social risks they pose, especially given climate change and sea-level rise. While such developments are not a feature of the New Zealand coastscape, the author's arguments and conclusions provide us with a cautionary tale. Read the article at: https://doi.org/10.64628/AB.54ucfkq9q

Aquatic conversations

The question '*What do bubble rings have to do with humpback whales and aliens*' is probably not one you have asked yourself. However, if you have, a recent study by the SETI Institute may just have the answer. The rings are large 'smoke-ring like' bubbles created underwater by humpback whales. Thought until recently to be associated with catching prey, this behaviour may in fact also be a sign of curiosity and an attempt to interact and communicate with humans. And the aliens? The WhaleSETI team behind the study suggest that this behaviour may echo a way in which aliens could attempt to communicate with humans. For the full story, see: https://www.dailymail.co.uk/sciencetech/article-14802467/Scientists-identify-strange-communication-Earth-oceans.html

Turning from whales to dolphins, the 2025 Coller-Dolittle Prize for Two-way Inter-species Communication was awarded in May to the Sarasota Dolphin Research Program at the Woods Hole Oceanographic Institution for their work on the meaning behind dolphin's whistles. Using non-invasive techniques, the researchers identified at least 20 different types of whistle, two of which were shared by at least 25 individuals. When these whistles were played back to dolphins, they triggered either avoidance behaviour – suggesting an alarm signal – or a range of responses suggesting dolphins encountering something unexpected. For more, see: https://www.theguardian.com/world/2025/may/15/us-scientists-who-deciphered-dolphin-whistles-win-prize-for-animal-communication

An anomaly, a rock and ... human ashes

Starting at the bottom of the sea, the famed 'alien' object in the Baltic Sea might finally have been identified. The object, discovered 90 metres down in 2011, is circular, with a diameter of approximately 60 metres, and inscribed with angular lines, making it resemble the *Millennium Falcon* from Star Wars. To add to the mystery, 'stair-like formations' led to a dark hole and another unknown object some 200 metres away. Despite a multitude of theories as to what the now-named Baltic Sea Anomaly could be (some more believable than others), the most recent analysis suggests a more prosaic origin story. To find out what, see: https://www.indy100.com/science-tech/anomaly-discovered-baltic-sea-2672378601

An article published by *Live Science* has an intriguing headline – 'There's a humongous boulder on a cliff in Tonga. Now we know how it got there'. The object in question, the Maka Lahi boulder, justifies the 'humongous' moniker, as it measures in at 14 x 12 x 6.7 metres and weighs 1180 tonnes. Oh, and it's 180 metres inland from the edge of a cliff. The most likely explanation was that the boulder was deposited by a tsunami, which would make it one of the largest rocks ever moved by a wave. A new study, referred to in the article, has identified when this could have happened, and the date suggested aligns with the evidence of a huge tsunami that hit the North Island some 7000 years ago. For more, see: https://www.livescience.com/planet-earth/geology/theres-a-humongous-boulder-on-a-cliff-in-tonga-now-we-know-how-it-got-there

And finally, returning beneath the waves, a novel proposal has been made to revive the British seabed – human ashes. Based on a pilot project in Bali, the UK company involved is now intending to offer underwater memorial reef structures made from human ashes, mixed with crushed oyster shells and concrete, giving a material proven to enhance marine growth. As well as attracting sea life, the company points out that underwater 'cemeteries' bypass the considerable environmental impacts of traditional funerals. To learn more, see: https://www.theguardian.com/environment/2025/jun/11/reefs-human-ashes-revive-british-seabeds-startup

Creatures – revived and creepy

A project to restore coastal wetlands in Toronto produced something of a surprise when century-old buried soil samples were examined. Expecting only to find trace evidence of past life, researchers instead discovered water fleas, worms, larvae and plankton quite active and obviously alive. Earlier, in the same area, seeds and plant scraps, trapped underground for more than a century, also came back to life after being disturbed by a bulldozer. These discoveries show what the wetland's life was like prior to being buried and underscores the resilience ecosystems can display. For more, see: https://www.theguardian.com/world/2025/oct/09/toronto-waterfront-soil-plants-worms

And finally, in what sounds like steam punk news (but isn't), the first methane-powered sea spiders have been found off the US West coast. There's more to the story than the creepy concept suggests – see https://edition.cnn.com/2025/06/17/science/spiders-deep-sea-methane-new-species

Accessing weblinks in the printed newsletter

Web links are an invaluable source of further information for readers, but in the printed version of *Coastal News* we can't include active links as we do in the pdf version.

We realise that manually copying long strings of seemingly random characters can be frustrating for readers, so for each issue we now produce a pdf file of live links – this can be found on the NZCS website at www.coastalsociety.org.nz/publications.

To make things even easier, you can access the pdf file by using the QR code to the right. The file contains every link published in each newsletter, organised by the pages where they appear, and all are active (clickable) links.

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Contributing to *Coastal News*

We welcome contributions for forthcoming issues of *Coastal News*. Please contact the Editor, Charles Hendtlass, at cellwairmonk@gmail.com if you'd like to submit an article, contribute a news item, have content suggestions or a photo to share, or to give some feedback on the newsletter.

The submission deadline for the next issue is March 20, 2026.

A Contributor's Guide is available for download from the Society's website at www.coastalsociety.org.nz (under the 'Publications' tab). This provides information on the style and format requirements when writing for NZCS publications. An index of articles previously published is also available for download.