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Coastal News

Te Hunga Takutai o Aotearoa
NEW ZEALAND COASTAL SOCIETY

CONTENTS

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Travel lift runways and inland lifting bay (Photo: Tauranga City Council)

Revitalising Tauranga's marine industry

By Lucy Brake, Contributing Writer

With the completion of construction tantalisingly close and the travel lift nearly operational, the Tauranga Harbour Marine Precinct will soon be ready to start working. These are exciting times in what has been a long process, lasting many years, to provide a bespoke maintenance and refit facility designed to stimulate Tauranga's marine sector.

Tauranga has a long history of being a key player in the marine and maritime transport industry. After the early immigrants arrived from Hawaiiki in approximately 1290 AD, to the opening of the Port of Tauranga in the 1870s and the construction of the slipway at Den Place in the early 1970s by the Bay of Plenty Harbour Board to service its tugs, this is just another major step on that journey.

Sitting on an historic reclamation alongside Tauranga's Harbour Bridge, the covered slipway at Den Place provided a base for a range of work to be completed on marine vessels for nearly 40 years. It played a key role in servicing local boats, charters and fishing vessels. In 2006 the slipway site was cleared to make way for the Harbour Link roading project and the new bridge structures.

Fast forward to 2014 and Tauranga City Council is breathing life into its multi-million dollar project to deliver a purpose-built marine servicing facility on a 3.5 hectare site at Sulphur Point, which will soon host New Zealand's largest capacity travel lift at 350 tonnes.

The facility is designed to foster the marine industry and support the future development of this sector says Tauranga City Council Councillor Max Mason, Chair of the Council's Economic Development and Investment Committee. "This will create significant opportunities for long-term economic development, business and job creation, and become a hub for the sub-regional marine sector." Phil Wardale, Project Director of the Tauranga Harbour Marine Precinct (also known as Vessel Works), is in charge of delivering this $11.4 million project and is excited about seeing the facility finally open its doors this year: "This work will unlock the potential to cater for commercial and recreational vessels, international and cruising vessels, and enable a cluster of marine businesses to build Tauranga into a premier destination for marine services."

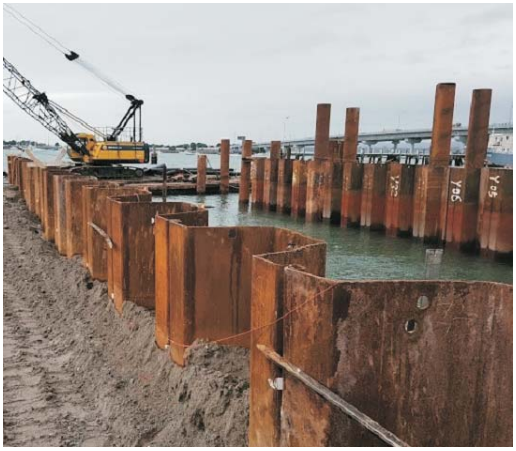
Priority One (Western Bay of Plenty region's economic development agency), with the backing of the Western Bay of Plenty Smart Economy Strategy and the Regional Bay of Connections Economic Development Strategy, views this project as a significant one for the sub-region. The funding for the precinct has been shared through a $5 million grant from the Bay of Plenty Regional Council's Regional Infrastructure Fund and Tauranga City Council's $6.4 million contribution offset by property sales both on site and nearby. From Max's perspective it is a game changer and worth every dollar spent: "An economic analysis report confirmed for us that this facility should deliver 195 new jobs during construction and in the marine sector, $15 million each year in added value to the regional economy and nearly $47 million in revenue generated every year."

Built on strong foundations

According to Phil, one of the biggest challenges the project team faced was delivering the development of a bespoke design within the constraints of an existing site with an historic reclamation about which little was known. Once the contractors started undertaking detailed investigations the extent of the contaminants became evident and clearing of these prior to the start of construction was prioritised.

The 6,300 m^2 heavy capacity hardstand is an integral part of the facility. The development of the hardstand has faced its challenges, including having to lift the area by 1 m to future-proof the Precinct from predicted sea level rise, as well as weather-related issues during the wet winter of 2017 that challenged the original construction programme. The hardstand design is an innovative type of pavement, which is more durable than asphalt, with a post-tension concrete pavement containing more than 35 km of steel cables in a grid pattern. Concrete has been poured over the top and the steel cables tensioned. There are three large slabs connected together that was built by three concrete pours, including one day where 1,175 tonnes was brought to the site by 22 concrete trucks completing over 90 trips from the cement plant. These three slabs provide the strength and durability as well as reducing the number of small crevices where contaminants could potentially get caught.

Significant improvements in wastewater treatment design have enabled the team to install some of the latest technology in the Precinct. The wastewater treatment plant will process all of the stormwater and washwater from the entire hardstand area in one place. “This includes water treatment devices as well as recycling solutions where filters will be used to remove toxins from the water collected within the hardstand area,” highlights Phil. “We wanted to be leaders in terms of the water quality treatment on this site, and I do believe we have achieved that. The system has the largest filter unit targeting potential contaminants and hydrocarbons in the country. There is also a plan to recycle some of the treated wastewater back through the water blasting process, thereby closing the loop.”



Panels lining the lifting bay (Photo: Tauranga City Council).

Constructing the new wastewater treatment plant, which services the entire hard stand area (Photo: Vessel Works).

A heavy-weight lifter

The true hero of the Precinct is the Italian built travel lift, from world leaders Cimolai Technologies. This will handle vessels up to 11.75 m wide and 45 m long, which will attract large commercial fishing vessels, work boats, fast ferries and maybe even some superyachts to Tauranga to be serviced on dry land by the businesses that are establishing themselves around the precinct. “It will deliver the boats straight into the businesses’ workshops, or park them on the heavy duty hardstand, which can store seven vessels up to 45 m long,” explains Phil. Work to prepare for the travel lift has been exhaustive, with all of the inland lifting bay (including 24 m deep tubular steel piles around the bay), the travel-lift runways, and the adjoining maintenance wharf now complete.

The vessel hoist lifting bay has been set into the existing land so that vessels can be taken out of the water without being impacted by tidal movements. The specification for the lifting bay was amended when civil works contractors HEB Construction was selected as the preferred contractor with an amended design being agreed with pre-cast concrete panels added to the face that extend to below low water. They set up a special pre-casting facility on site, which was also used to prepare the precast tidal stairs for the Tauranga Waterfront project last year. “In this way we were able to achieve some efficiencies for both projects as well as ensure the pre-casts were a perfect fit,” says Derrick Adams, CEO of HEB Construction. The purpose of these panels is to provide protection for the sheet piles and will create a constant surface for vessels to fend from. “These panels add to the variety of components that HEB have cast on site,” notes Derrick. The arrival pontoons have been installed on the outside of the travel-lift runways designed to support vessels using the travel lift and also to provide new floating servicing berths. The

Travel lift under construction in Italy (Photo: Tauranga City Council).

travel lift arrived in Tauranga in late February, after travelling by sea from Italy in a number of 40 ft containers, and as this article went to print was being assembled and commissioned.

Future proofing

At the heart of the Precinct is the future proofing of the entire facility. From lifting the hardstand 1 m to sit at an RL of 2.8 m, to the innovative wastewater treatment plant and the closed loop for water blasting, to future proofing the underground horizontal infrastructure for the extension of the hardstand in Stages 2 and 3, there are many parts of this project that have gone above and beyond standard practice. In particular, the partnership approach taken to engage with, and gain support from, the local marine refit industry is a fantastic example of collaboration in action. From Phil's perspective one of the great successes in their work has been delivering a project that "strategically acknowledges Tauranga's marine refit industry and the history of the site, and that is built upon the commitment and participation of the local industry who have, quite literally, co-invested in this facility".

Tauranga is already internationally renowned for its marine sector expertise in craftsmanship and innovation. Phil says the marine precinct offers all the infrastructure and space for the marine cluster to be 'more competitive and grow' with its direct and easy access to deep water, its 350 tonne capacity travel lift, closeness to the Port of Tauranga and the central city, as well as easy road and rail links around the country. "All of these factors mean we are on the brink of an exciting new stage in Tauranga's marine industry and one that this facility will play a key role in," highlights Phil. With the official opening planned for this autumn the team is now looking forward to the coming couple of years to secure the successful operation of this truly high-class marine facility.

Check out these videos of construction underway last year:

https://www.youtube.com/watch?v=w0n5LWvvGZw&feature=youtu.be

https://www.youtube.com/watch?v=_McbEGctds&feature=youtu.be

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 some news items, have content suggestions, or would like a contributor's guide. **For the next issue** (July) we are planning to cover the unusual weather that struck the country in early 2018 (including former cyclones Fehi and Gita). If you have photos, or would like to contribute an article or short piece on the impacts in your region, please contact the Editor. ***The submission deadline for the next issue is 31 May 2018.***

NZCS Regional Representatives

Every region has a NZCS Regional Representative who is available to help you with any queries about NZCS activities or coastal issues in your local area. If you are interested in becoming involved as a regional representative, please get in touch with Paul Klinac (paul.klinac@aucklandcouncil.govt.nz).

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Estuary management in New Zealand – insights from a study tour

Jaclyne Scally, Consultant, RM Consulting Group

This January I had the good fortune of visiting New Zealand as part of a self-directed study tour funded by the Department of Environment, Land, Water and Planning (DELWP) in my home state of Victoria, Australia.

The study tour came about in response to the conflict that exists between agriculture and the environment at estuaries in Victoria. At these locations, agriculture is often firmly established in the landscape with generational farmers occupying the floodplains. Since European settlement, it has been common practice for landholders to regularly open the estuary mouths to drain water off the floodplain to enable grazing of pastures. In more recent decades, there have been increased efforts by land managers to restore and protect the ecological functioning of estuaries, such as managing artificial estuary openings to allow longer periods of floodplain inundation.

While this has enabled some environmental restoration, it has effectively created a 'winners and losers' scenario between the environment and agriculture. In an endeavour to find better, 'win/win' solutions for the environment and farmers at estuaries, I set off to see what our neighbours across the Tasman are doing.

Early on, I came across New Zealand's Living Water Programme – the 10-year partnership between Fonterra and the Department of Conservation (DOC) focussed on finding solutions to enable farming and healthy waterways to coexist. The programme aligned nicely with my objectives and I built my itinerary around visiting three of the five Living Water catchments. This included the Wairua River and the Pukorokoro-Miranda catchments on the North Island, and the Waituna Catchment on the South Island. At each site, I spent a day or two meeting with the local DOC staff and exploring the works they were undertaking on farms in the catchments.

Side visits also took me to Hokitika, on the west coast of the South Island, where I met with Don Neale (DOC) and others from the NZ Coastal Society; Christchurch, to meet with Environment Canterbury; and Wellington, to meet with Helen Kettles at DOC.

Exploring estuaries on the west coast of New Zealand's South Island (Photo: Jaclyne Scally).

The Chenier plains at Miranda provide important habitat for migratory shorebirds on the Asian-Pacific flyway (Photo: Jaclyne Scally).

The study tour provided a unique opportunity to step out of the day-to-day routine, and consider different ways of doing things, ponder new opportunities, and meet some really great people! There's too much to detail here, so instead I have shared some of the interesting approaches and ideas I encountered in my travels and discussions with people.

AirBnB for Birds

This was one of my favourite initiatives, introduced to me by Helen Kettles, National Estuaries Advisor at DOC. The initiative draws on AirBnB's sharing economic model to provide 'pop up nature reserves', whereby landholders are paid to temporarily provide habitat on their land at certain times of the year. The Nature Conservancy in the United States has been pioneering the integration of the AirBnB model into conservation in California's Sacramento Valley since 2014. Here, they have been paying rice farmers to flood their fields for a few weeks each fall and spring, to provide a wetland habitat for migratory birds. This means that flooding is occurring at a time when the fields would usually be dry, thus a team of ecologists and economists determined how much compensation was required to support farmers for this change. They ran a 'reverse auction' in which landholders specified the lowest payment that would entice them to flood their fields for a four-to-eight week period.

Looking north across Waituna Lagoon, where agricultural land directly abuts coastal wetlands (Photo: Jaclyne Scally).

Low density development on the west coast of the South Island allows the natural mobility and closure of estuaries to occur with little or no intervention (Photo: Jaclyne Scally).

The potential for this model to provide win/wins for conservation and landholders in highly dynamic environments, such as estuarine floodplains, is significant, where it's desirable for agricultural land to be inundated at particular times to support bird and fish communities. The beauty for landholders is that it provides an in-between alternative to a more permanent land use change, such as a buy-back or nature reserve transition. It works on a 'rent, rather than buy, model'. And it remains more cost-effective than an outright buy-back and enables farmers to remain on their land and farm at other times.

Blue carbon

Early investigations into blue carbon ecosystems (sea grass, mangroves and saltmarsh) is being undertaken in New Zealand. In 2017, the Ramsar Convention joined the International Partnership for Blue Carbon. The partnership aims to protect and restore coastal blue carbon ecosystems by building awareness, exchanging knowledge, and accelerating practical action. Future actions will include catalysing project development at larger scales in priority regional 'hotspots' and linking blue carbon projects with climate finance.

With blue carbon habitats increasingly becoming part of the international climate change dialogue, and the Ramsar Convention now focussing on the value of blue carbon habitats, there is likely to be growing interest and investment in this area. This may also present significant opportunity for private landholders farming marginal coastal and estuarine areas.

Land purchases

Government buy-backs of private land is being implemented at one Living Water site, and considered at another. The most progressed land purchase project is the 'Coxhead land acquisition' in the Pukorokoro-Miranda catchment, located on the Firth of Thames/Tikapa Moana approximately 80 km south east of Auckland. The catchment flows into an 8,500 ha Ramsar listed coastal wetland and provides a significant habitat for migratory shorebirds, including a Chenier plain – a rare coastal landform consisting of a series of ridges comprising marine shells.

The shorebird area and habitat has been significantly degraded and reduced in size, largely due to dairy, beef and sheep farming in the catchment. A focus of the Living Water project at this site has been the

Exploring west coast estuaries with Don Neale (DOC), where rainfall is measured in metres! (Photo: Jaclyne Scally).

protection and expansion of shorebird habitat. At the commencement of the project, modelling was undertaken to identify where the best habitat gains could be achieved. The Coxhead family farm was identified as a site that would provide high habitat value if it was to return to a more natural hydrological regime. Since 2015, DOC has been working towards purchasing 23 ha of the total 60 ha property to reinstate as a conservation reserve.

Let them be!

And then of course, there is the option of leaving estuaries to do their thing! And while there's not many places where this is a genuinely feasible option, the west coast of New Zealand's South Island is an exception. In this part of the world, rainfall is measured in metres with up to 7 m falling annually at sea level. Rainfall in the mountainous catchment can be up to 14 m/year at some locations, and the very steep terrain shifts large volumes of water and sediment giving rise to impressive river and estuarine systems. Within 600 km of coastline, there are 340 estuaries and waterway outlets!

The west coast of New Zealand is sparsely populated, with large tracts of the catchments secured in conservation land. This means that there are more opportunities in this part of the country to allow the natural mobility and closure of estuaries to take place with little or no intervention. It's an enviable position for estuary managers elsewhere!

Historical images remind us of the highly dynamic nature of estuaries, with mouth openings moving up and down coastlines and river channels changing course. Whilst development is scarce, some estuaries have been modified, such as the Grey River at the portside township of Greymouth, and at other estuaries to support agriculture. However, there are also a significant handful of other estuaries that are left to their own devices or are intentionally protected, such as the Mahinapua Creek where whitebaiting is prohibited. The scale and number of estuaries on the west coast means that more of a 'landscape scale approach' can be taken, where some intervention is permitted at some estuaries, but not at others.

I wish to also extend a big thank-you for the warm hospitality extended to me by all the DOC staff I met, and a particular thank-you to Helen Kettles and Don Neale for putting me in touch with the who's who of estuary management in New Zealand!

UN Ocean Conference report

Lucy Underwood, NZCS PDA recipient 2017

In June 2017 I flew to New York City to attend the United Nations Ocean Conference, a global summit seeking to address sustainable development goal 14 'Conserve and sustainably use the oceans, seas and marine resources for sustainable development'. This goal forms one of 17 set by the United Nations to face our world issues. The Ocean Conference was intended to create a platform for dialogues and sharing of information. Historically ocean conservation and sustainability has never received this type of attention at the United Nations, and that in itself meant this conference was a success.

Politicians, NGOs, indigenous communities, private sector representatives and scientists were all in attendance, and each provided a different perspective. From New Zealand there were representatives from Ministry for the Environment, Ministry of Foreign Affairs, Sustainable Coastlines and te ikaroa, with Maggie Barry being our formal representative. The talks were varied, from high-level policy such as strengthening the science-policy interface through a 'regular process' internationally, to heart-wrenching displays of indigenous communities from Papua New Guinea addressing states on deep sea oil explorations and their human rights.

The successes? My first observation was that the science wasn't contested. Witnessing displays from countries such as Tokelau definitely solidified urgency and created emotive attachments to removed discussions on ocean health, conservation and climate change.

It also outlined how little some countries (and the public in general) know about the importance of the oceans for the health of our planet, which has driven ocean literacy and education programmes internationally. Sweden, Germany and Norway were stand-out countries, their innovation was well broadcasted including a full transition toward a circular blue economy – focused on solutions to key challenges of marine litter, sustainable protein sources, and marine pollution.

The outcomes? The conference did not produce prescriptive targets that countries are bound to. Instead there was a call to action 'Our Seas Our Future' signed that outlined the key goals discussed during the week. Anyone could submit voluntary commitments that had measurable deliverables and timeframes for action. Over 1,400 commitments have been made, with 22 from the New Zealand Government. Communities of ocean action were formed based around key implementation areas, for example mangroves and coastal ecosystem management, coordinated by the United Nations to follow up on commitments. Another target was to improve and enhance the international law of the high seas as outlined in UNCLOS. The United Nations have announced that the next decade has been dedicated to ocean science, to advance the research and technological innovation for the future.

The Aotearoa Youth Leadership Institute delegation at the Ocean Conference (Photo: Lucy Underwood).

Lucy (left) and fellow delegate Tegan Arnold (right) at the UNDP Ocean Conference stand (Photo: Lucy Underwood).

The weaknesses? It was easy to see how simplified action and implementation gets at an international level, to get any sort of agreement. There was perhaps too much focus on the problems and not enough focus on the solutions. A lot of the material was re-hashed, where people were saying what needed to be said, however was it genuine? The 3 Rs (reduce, reuse, recycle), collaboration, the fall back on more data required before action is taken, were heavily repeated.

The NZ Coast? These international agreements form precedents to global action. There have been cases in America where at a local level governments have had to prove how decisions they are making reflect these commitments to sustainable development. New Zealand did not specifically submit a voluntary commitment on coastal management (besides some estuarine protection area reporting), however there is a strong emphasis within the targets of SDG14 for protection of coastal ecosystems, building resilience, and improving treatment on land to reduce the impacts of marine pollution on coastal areas. There was a global push to increase natural resilience in vulnerable coastal fringes through mass scale mangrove restoration, blue forest projects across the globe.

Overall it was an invaluable experience. I am very grateful to the New Zealand Coastal Society and AR & Associates Ltd for assisting me in getting to UNHQ, New York City. I hope in everyone's busy day-to-day work schedules you can take a step back and reflect on the bigger picture, and help to achieve SDG14.

A surge of spurge? Assessing the invasive risk of *Euphorbia paralias* in New Zealand

Mitch Rawlyk, MSc student, University of Otago

It has been widely acknowledged that in conjunction, climate change and biological invasion of species pose serious consequences with regards to biodiversity in the era of globalisation. To assess the potential conservation issues that invasive species and climate change pose, especially with regards to scale of risk, species distribution models (SDMs, or ecological niche models, ENMs) have been previously used.

Euphorbia paralias, or Sea spurge, is a coastal dune plant that is indigenous to the sandy shores of the Atlantic Ocean, namely from Mauritania (west Africa) to Southern Ireland and England, and also found both around the Mediterranean Sea and the Black Sea. Outside of Europe, initial plant collections of these species in Australia were made in 1927 (Albany) and 1934 (Port Victoria); the occurrences of the plant in these locations strongly suggest that seeds were accidentally introduced through the ballasts of grain ketches during shipping. Since introduction to Australia, the species has progressed both west and east-ward along the coasts of southern Australia and by 1980 it had been sighted in Tasmania.

Central to the success of this long distance dispersal, is the fact that the seeds of *E. paralias* are able to survive in seawater for up to six years. Combined with this ability, the plant's native and introduced range, and the predominant direction of ocean currents, all meant that introduction to New Zealand was likely; in February of 2012, Sea spurge was detected at Aotea Harbour on a remote section of the west coast of the North Island (approximate latitude of 38° south).

The establishment of Sea spurge in New Zealand is of concern, as it has wreaked havoc on Australian beaches, and very well may do the same in New Zealand. The noted effects of Sea spurge in Australia are the displacement of native plants, disruption of natural patterns of sand movement, a reduction in the recreational value of beaches due to its preferred occupancy in areas of bare sand, and the dangers posed by the plant's white sticky sap, which is within Sea spurge, that is acknowledged to be toxic.

To assess the potential spread of *E. paralias* in New Zealand, an ecological niche model was constructed. The climatic characteristics associated with the known distribution of *E. paralias* in Australia (see Figure 1 and Table 1), were used as a proxy to model the risk of invasion in New Zealand in a contemporary setting.

Four climatic parameters were used: mean annual

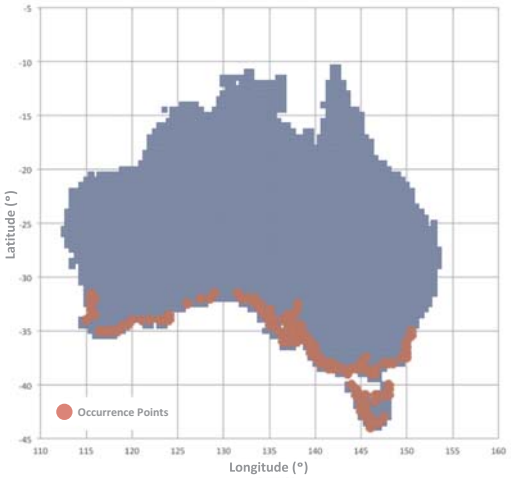

Figure 1: The occurrence records of E. paralias *in Australia.*

temperature (°C), mean temperature of the coldest quarter of the year (°C), annual precipitation (mm), and precipitation of the warmest quarter (mm). Subsequently, climate data was altered in accordance with climate projections from New Zealand's Ministry for the Environment, which have been used to further assess invasion risk in a changing climate. These projected changes are guided by Representative Concentration Pathways (RCPs) as identified by the IPCC. In essence, a higher RCP projects a higher concentration of greenhouse gases emitted by humans and thus a higher temperature. Finally, the realised niche, or the niche that *E. paralias* occupies in actuality as a consequence of both its adaptations and interactions with other species, was qualitatively assessed to ascertain if a shift in the realised niche is possible/likely through the use of climate space plots.

Before assessing the risk of invasion by *E. paralias*, five limitations of the study must first be highlighted:

- Firstly, the modeled outputs display that risk of invasion as a percentage of New Zealand land coverage in its entirety; however, *E. paralias* thrives in coastal areas and rarely makes it past the incipient foredune, thus leading to a vast overestimate.
- Secondly, the model does not take into account several other factors, such as soil type, mean diurnal temperature range, precipitation of the wettest quarter, and the other thirteen bioclimatic variables offered by WorldClim.

	Current Mean Annual Temp. (°C)	Mean Temp. Coldest Quarter (°C)	Annual Precip. (mm)	Precip. Warmest Quarter (mm)
Min	8.1	4.3	268	37
Max	18.4	13.7	2506	427

Table 1. Climatic ranges as a function of where Euphorbia paralias *occurs in Australia.*

Coastal News

Te Hunga Takutai o Aotearoa NEW ZEALAND COASTAL SOCIETY

- Thirdly, the use of Microsoft Excel, albeit elementarily effective to model the invasion risk of *E. paralias*, does not have the computing power that is used in other studies.
- Fourthly, there is an assumption that within Australia, *E. paralias* occupies its fundamental niche, or the niche that a species could potentially occupy given its physical characteristics and evolutionary adaptations, which is rarely the case due to an array of interactions with other biota and constraints on dispersal.
- Fifthly, the fact that *E. paralias* is indigenous to Europe cannot be ignored, especially since the model is based solely on the occurrence of the species within Australia, where it may not have had sufficient time to fill its realised niche. Doing the assessment as is assumes that *E. paralias* has fulfilled its fundamental niche in Australia, which may or may not be the case. To make the assessment of risk invasion within New Zealand more robust, it may be beneficial to assess occurrence records from Europe with the associated climate. Jeschke & Strayer (2008) point out the limitations of bioclimatic models, which assume that geographic ranges are not influenced by biotic interactions or evolutionary adaptation, and that the target species (i.e. *Euphorbia*) fully occupies only the modeled favourable locations.

With no consideration of climate change, the model based on the four climate variables estimates that 53.4% of New Zealand is considered to be at risk of *E. paralias* invasion – again, this is considered to be a vast overestimate due to limitation one (see above). With a consideration of only a change in temperature, 83.9% of New Zealand's land cover is subject to invasion risk by 2040 and 2090 (RCP 2.6; +1.0 °C). Under the scenario of RCP 8.5, which entails an increase in temperature by 1.0 °C, an estimated 82.5% of land cover is expected to be at risk; by 2090, the model shows that under RCP 8.5 (+3.0 °C), 81.23% of New Zealand will be at risk.

When both a change in temperature and precipitation is considered, new patterns start to emerge. Under the RCP 8.5 (2040) scenario, an estimated 74.82% of New Zealand's land area is considered to be subject to invasion, whilst by 2090 under the same scenario (but +3.0 °C), an estimated 69.35% is at risk of invasion. Figure 2 maps the modeled results from the last of these climate scenarios.

The climate space diagram in Figure 3 shows where the recorded occurrence of *E. paralias* in Australia overlaps the climatic characteristics found in parts of New Zealand. Modeling in this manner shows the potential occupancy of *E. Paralias* in New Zealand with regards to the available climate space in New Zealand and where – in climate space – the plant occurs in Australia, and if expansion of range within New Zealand could occur outside the climate space of Australia. For instance, the maximum and minimum mean annual temperatures that *E. Paralias* can withstand in Australia are 18.4°C and 8.1°C, respectively; the maximum and minimum mean annual precipitation that *E. Paralias* can withstand in Australia are 2506 mm and 268 mm, respectively.

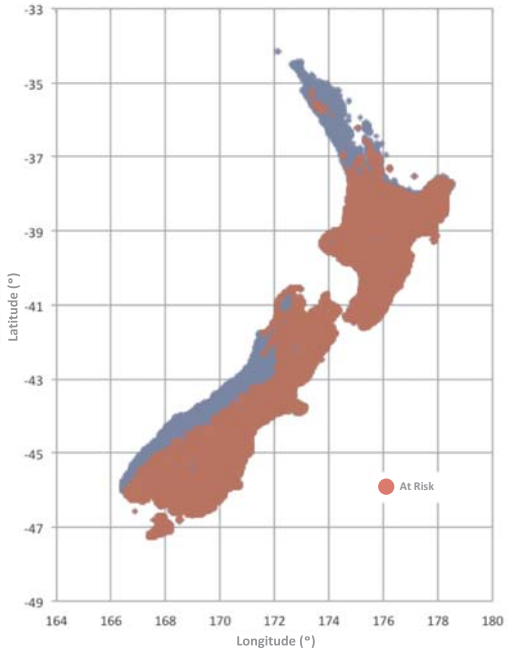

Figure 2: Predicted occurrence of E. paralias *under RCP 8.5 (2090; + 3.0 °C, precipitation by region); the climatic conditions considered are mean annual temperature, and mean annual precipitation. The model used (with the acknowledged limitations) produces an estimate that 69.35% of New Zealand is at risk.*

Within New Zealand, the bulk density of climate space exists well within the range of both mean annual temperature and precipitation. Thus, the climate space modelling effectively shows that *E. paralias* invasion is a significant threat to New Zealand, and that the threat is likely to increase as a result of climate change.

Thorough efforts should therefore be made to monitor and mitigate the invasion of *E. paralias* within New Zealand.

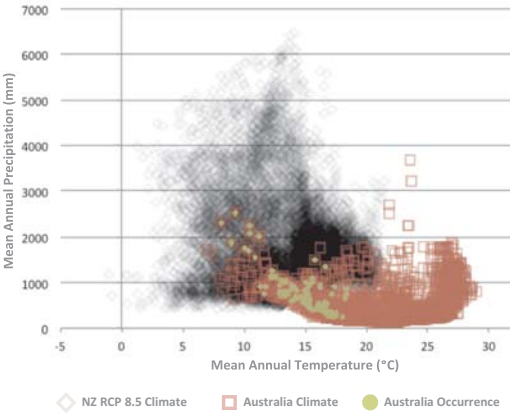

Figure 3: The contemporary climate space of Australia and projected climate space of New Zealand under RCP 8.5 in 2090 (as a function of mean annual precipitation and temperature) with the occurrence of E. paralias *in Australia.*

Reference

Jeschke, J.M. & Strayer, D.L. (2008). Usefulness of bioclimatic models for studying climate change and invasive species. *Annals of the New York Academy of Sciences*, 1134, 1–24.

2017 NZCS Conference review

Mark Ivamy, NZCS 2017 Conference Organising Committee Chair

Kia ora tātau

Thanks to everyone who travelled to Tauranga Moana for the 2017 NZCS Conference from 14-17 November. The 2017 theme of 'Changing Coasts – Papaki kau ana nga tai o Mauao' reflects the constant change of our coasts through coastal processes, biodiversity, climate, development and also geological processes as recently experienced in Kaikōura.

The Organising Team would especially like to thank all the people who contributed across the three days at the presentation sessions, fieldtrips, panel discussions and coastal careers breakfast. Also special recognition is given to Reon Taunau, Kiamia Ellis (Ngāi Te Rangi) and Carlton Bidios (Ngāti Ranginui) who delivered a welcoming mihi whakatau and whaikōrero to open the conference and endorse our shared kaupapa of coastal management in Aotearoa. Please visit https://www.coastalsociety.org.nz/conferences/nzcs-2017 to find details on all our wonderful partners who continue to support the NZCS and the annual conference.

The highlight for me was he tāngata, he tāngata, he tāngata. I enjoyed walking through the waterfront venue and watching connections being made across the sectors of planning, science and engineering. Attendees came from the length of Aotearoa (and even one delegate from India) to share innovative ideas, new science and developments in best practice.

The engagement from young professionals and students at the 2017 NZCS Conference was also impressive. Karin Bryan and her team hosted over 50 students at the Coastal Careers Breakfast providing our young members with access to industry mentors in an informal environment. I'm delighted that this event, developed by NZCS ex-Chair Rick Liefting, continues to grow and delivers significant benefits to our members starting their careers.

The three NZCS life members sharing a humorous recount of the society's first 25 years (Photo: Mark Ivamy).

An energetic few take a stroll after the conference close and are rewarded with a spectacular view from Mauao summit (Photo: Mark Ivamy).

A strong line up of keynote speakers sparked the three conference days into action:

- Manea Sweeney and Dr Leigh Bull
  North Canterbury earthquake: Environmental challenges and opportunities of the coastal reinstatement programme
- Jack Thatcher
  Lessons from the Moana
- Professor Paul Kench
  National Science Challenge Programme Leader: Living at the Edge: Transforming the Margins (Resilience to Natures Challenges).

(To find out more on the keynote speakers, visit https://www.coastalsociety.org.nz/conferences/nzcs-2017/keynote-speakers).

I'd like to remind you of Manea's challenge to our Society – share and communicate your work with the community through simple stories based on experiences and clear messages.

The 2017 NZCS Conference in Tauranga was the 25th annual event and celebrated in style with an awards dinner. Congratulations to all the NZCS award winners and also to the winners of the conference prizes:

- Terry Healy Award – Living at the Edge: Transforming the Margins (led by University of Auckland)
- Sustainability Award – Conrad Pilditch
- Best Overall Oral Presentation – Pim de Monchy
- Best Student Oral Presentation – Kim Evans
- Best Poster – Emily Tidey.

This year we gave a couple of new things a go. We trialled the video of the Sustainable Seas conference session to provide value to our wider members and also to delegates who may have missed this 'mini symposium', which was sponsored by the Sustainable Seas National Science Challenge. Please visit https://webcast.gigtv.com.au/Mediasite/Login/Register?ReturnUrl=%2FMediasite%2FCatalog%2Fcatalogs%2Fnz-coastal-society-conference-2017 to view the presentations and the keynote address from day one. A networking event for young professionals was also introduced into the programme. This successful event was facilitated by PIANC and provided a great opportunity for our members to grow their connections.

Thanks again to everyone who attended the 25th annual NZCS Conference in Tauranga Moana and made it a success. We look forward to seeing you all again this year in Gisborne!

Coastal News

Te Hunga Takutai o Aotearoa
NEW ZEALAND COASTAL SOCIETY

Chair's message

by Hugh Leersnyder

Last year's NZCS conference in Tauranga will go down in the Society's 25 year history as an outstanding success – well done to Mark Ivamy and his team. The quality and diversity of topics and presentations was complemented with an outstanding array of site visits and hospitality from the Bay of Plenty.

This year's conference will, for the first time, be held in Gisborne, Poverty Bay – first city in the world to see the new day. In total contradiction to the province's name, the area is rich in history, culture and its reliance and relationship with the sea. Murry Cave, chair of this year's conference organising committee, has matters well underway for another memorable event. Keep an eye out for the opportunity to join us in Gisborne in November 2018.

This year is shaping up to be a busy one for the Society. Our new Chair, Tom Shand, has great ideas and an enthusiasm to reach out to our members and other like-minded groups. As a Technical Interest Group of Engineering New Zealand (ENZ), our members have much to offer ENZ's initiative to provide greater guidance to decision makers, contributing to the catch cry 'engineering a better New Zealand'.

It is obvious from the content of this *Coastal News* that there is a lot going on at national and regional levels. Some planned, some predicted, but maybe not necessarily expected. MfE's release of 'Coastal hazards and climate change guidance for local government' in December 2017 will be socialised this year. The topic came into sharp relief in January 2018 as parts of the country were buffeted by two ex-tropical cyclones, four weeks apart and coincident with King tides!

The recently released DoC 'Review of the effect of the NZCPS 2010 on RMA decision making' also provides fodder for more discussion. The review highlights the challenges of managing cumulative effects and an inconsistency around the country on the implementation of the NZCPS. The polarised views on the implications of the King Salmon decision on NZCPS directive policies need to be thrashed through to move forward.

I recently attended an event hosted by the Embassy of the Netherlands on 'Climate change and its effects on water' held at the Volvo Ocean Race Village at Auckland's Viaduct Harbour. A speech by Hon James Shaw, Minister for Climate Change, provided some interesting insights into the government's direction. This was complemented with a presentation by Adrienne van Der Sar, Deputy Director of the Netherlands Delta Commission. This Commission has a broad-reaching oversight on matters to protect the Netherlands from flooding and to provide for adequate fresh water – lots of lessons to be shared. Adrienne finished her presentation aptly with a Jimmy Dean quote:

> *I can't change the direction of the wind, but I can adjust my sails to always reach my destination.*

Adaptation is about tacking as the wind shifts, but staying on course!

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News from the regions

Auckland

Sam Morgan, Natasha Carpenter and Lara Clarke, Regional Representatives

5th January storm damage – Auckland Council coastal management responses

A large swell event (~2-3 m), combined with higher than average (king) tides (~4.2 m), peaked on the 4th to 5th January 2018. The event resulted in significant damage around the Auckland coastline, particularly in exposed and low-lying areas.

In total, Auckland Council has identified 67 sites across the Auckland Region requiring repair works in response to the event, including Omaha, Takapuna, Cockle Bay, Maraetai, Orere Point and Clarks Beach. Damage to some additional key sites and actions currently being undertaken by Council are summarised below.

Stanmore Bay

Stanmore Bay to the south of Orewa Beach on Whangaparaoa Peninsula experienced erosion of the coastal edge and beach lowering. A vertical scarp of approximately 2 m developed in front of the playground with relic rock armour exposed along the foreshore.

Following fencing of the area, emergency works have been undertaken to make safe and restore the coastal edge. The exposed, unconsented rocks have been removed from the foreshore, the foreshore scarp has been reprofiled with coastal trees, and park infrastructure relocated landward as required. A partial section of rock revetment has been rebuilt to provide ongoing protection to a toilet block adjacent to the boat ramp. Dune planting to increase stability and buffer the potential for windblown sand is scheduled for winter 2018 and the site will be subject to continuous monitoring.

Coastal erosion at Stanmore Bay (Photo: Paul Klinac, Manager, Coastal & Geotechnical Services, AC).

Removal of relic rock armour and reprofiling of coastal edge (Photo: Natasha Carpenter, Principal Coastal Specialist, AC).

Orewa Beach

Orewa beach, on the north-east coast of Auckland, suffered severe erosion in front of the Reserve. Development of steep erosion scarps posed a health and safety risk to the public and restricted access to the beach.

Sand transfer from the southern end of the beach, where sand volumes accumulate adjacent to the Waitemata Groyne, was initially completed at the end of January to replenish the beach and resolve health and safety issues. Further reshaping has been completed in early February following a second storm event.

Erosion Scarp at Orewa (Photo: Matthew McNeil, Coastal Engineer, AC).

Hudson's Beach

Flooding of the low-lying reserve and failure of approximately 200 m of vertical timber seawall occurred at Hudson's beach on the east coast of the Manukau Heads, Awhitu.

Damage included dislodged foundations, uplifting of the capping rail and broken top boards, exposure of tree roots, and deposition of debris. Seawall renewal works are scheduled to commence in early March 2018.

Coastal inundation at Hudson's Beach (Photo: Jo Morriss, Coastal Scientist, AC).

Damage to vertical timber seawall at Logan Drive (Photo: Jo Morriss, Coastal Scientist, AC).

Waikato

Christin Atchinson and Jacqui Bell, Regional Representatives

Mediterrranean Fanworm

The infestation of Mediterrranean Fanworm *Sabella spallanzanii* (Sabella) has unfortunately reached a point in Coromandel Harbour where MPI and WRC consider eradication no longer feasible.

Spreading of the pest occurs mainly by hull biofouloing on recreational and/or commercial vessels. Sabella poses a direct threat to commercial shellfish farming as well as native ecosystems as it easily spreads and outcompetes other species where it becomes established.

Mediterannean Fanworm (Sabella spallanzannii) *(Photo: MPI).*

The likelihood of continued spread in the near future is extremely high due to the heavily infested Waitemata Harbour, the popularity of the Coromandel for recreational boat owners travelling to and from the Waitemata Harbour, and the high number of vessels moored in Coromandel Harbour with varying states of hull fouling.

However, advocacy and survey efforts to stem the spread have proved effective. Annual surveys of the wider Coromandel Peninsula have proved an important early detection tool. An isolated infected hull was found in the Whitianga marina and was able to be quickly dealt with.

More broadly, a collaboration of six North Island councils (Northland, Auckland, Waikato, Bay of Plenty, Gisborne and Hawkes Bay) and MPI, called The Top of the North Marine Biosecurity Partnership, is in the early stages of developing a draft Marine Pathways Management plan that will focus on managing the spread of marine pests between the regions.

Waikato Regional Coastal Plan Review

Scoping and phasing of the review of the Waikato Regional Coastal Plan is well underway. Project governance was finalised in late 2017. It is intended that the Regional Coastal Plan and Waikato Regional Plan be reviewed concurrently and merged into a single plan: 'Healthy Environments – He Taiao Mauriora'. It is expected that the first phase of the plan will be notified from late 2019 and will include the coastal structures, public access and open space, and aquaculture topics. Other topics will be notified in the second phase, expected in late 2021.

Coromandel Streams Investigation

In January and February 2015, Waikato Regional Council (WRC) investigated the water quality at several stream mouths throughout the Coromandel and found that some of these water bodies were particularly susceptible to contaminants (excess nutrients and faecal bacteria) that are washed from the surrounding land, particularly 24-48 hours after heavy rainfall.

In Jan-Feb 2017 follow up studies were undertaken in four catchments (Stewart Stream (Opito), Kuaotunu Stream, Taputapuatea Stream (Whitianga), and Pepe Stream (Tairua)) to further identify potential causes of contamination. The study was designed to identify the source of contamination within the catchment and whether it was derived from humans or ruminant animals. It also investigated how the concentration and source of contamination might change during dry and wet weather and during spring and neap tides.

The findings from this investigation have been published (https://www.waikatoregion.govt.nz/services/publications/technical-reports/2017-technical-reports/tr201725/) and will help WRC better understand the range and source of contamination at these locations following different weather and tide events. Also, it will help WRC to develop targeted investigations and responses to coastal water quality issues throughout the Waikato region. It may also inform the development of catchment management initiatives if there are opportunities to reduce contamination into these streams.

Mangrove Bill

A proposed Mangrove Management Bill brought before Parliament by National's MP for Coromandel, Scott Simpson, would allow for the development and implementation of a mangrove management plan and provide the ability to Thames-Coromandel and Hauraki District Councils to remove mangroves without resource consent. The public submission period on the bill closed on 23 February 2018 and a Parliamentary Select Committee will hear submissions on Friday, 16 March 2018 in Thames.

Recreational Water Quality Monitoring

Last summer, WRC re-activated a water quality monitoring programme at seven east coast and two west coast beaches, testing whether faecal bacteria levels were within suitable levels for contact

recreation, such as swimming and surfing. It was the first such testing since 2009 and the re-activation was part of WRC's drive to gain better information about what's happening in the region's coastal waters and to provide a community service. The programme has continued throughout this summer.

Between November and March, beach users can go to www.waikatoregion.govt.nz/coastalresults to check what the latest results are for the targeted beaches.

State of our Gulf

The Hauraki Gulf/Tīkapa Moana/Te Moana-nui-a-Toi State of the Environment Report 2017 has been released providing the latest snapshot of the wellbeing of the Hauraki Gulf Marine Park. It runs a ruler across 11 key environmental indicators and highlights significant challenges.

The Gulf Journal provides a review of the 11 key indicators:

- Fishing continues to have a significant impact on the marine ecosystem. Some important stocks like snapper are overfished, crayfish are at their lowest levels in 40 years, a large newly-discovered scallop bed has collapsed, and bycatch of seabirds remains a concern.
- Heavy metal concentrations, sedimentation rates, and nitrogen concentrations increasing in some places and having ecosystem impacts.
- Regular microbial contamination at bathing beaches that can compromise human health.
- New foreign marine species arrivals with the potential to become pests.
- Increasing biodiversity values on 47 islands that are now free of predators across the Gulf.
- An improved outlook for resident Bryde's whales.
- Continued concern about the long-term survival of seabirds, particularly the fairy tern, New Zealand storm petrel, black petrel, and flesh-footed shearwater.
- The ubiquitous presence of plastic pollution around the Gulf.

Bay of Plenty

Jonathan Clarke and Kieran Miller, Regional Representatives

Mauao Reserve Management Plan review

Mauao is special to many different people for many different reasons. It is a spiritual home, a historic reserve, a tourist attraction, a treasured recreational playground. While formal ownership rests with the Mauao Trust, a wide range of people in Tauranga and beyond identify closely – and passionately – with the mountain.

The review will seek to assess whether the things Tauranga City Council are already doing are still the best way forward, as well as looking ahead to see if there is anything that should be done differently. A draft plan was prepared and went out for consultation in July 2017. The consultation period has closed. Submissions will be heard in late October.

Mauao base track repairs

In April 2017, the base track around Mauao was damaged during ex-Cyclone Debbie. Tauranga City Council is working to restore and improve the track for the long term. Temporary access has been restored to the base track, enabling walkers to once again complete a loop around Mauao. Box steps have been built up and around the slip site. It will remain in place until a long-term solution has been completed. TCC are currently working through a long-term, sustainable solution to slip damage that will involve building a new section of track that runs along the beach at Pilot Bay, past the statue of Tangaroa. TCC is currently in the design and consenting stage of the project.

Tauranga Happy Harbour Fun Day 2018

On Saturday the 3rd of March, Bay of Plenty Regional Council hosted the Happy Harbour Fun Day at Memorial Park. The event was well attended by nearly 3000 kids and adults interested in learning about Tauranga Moana. Highlights included marine biologists dissecting a shark, crab and critter hunts, using microscopes to get up close with tiny creatures, and the numerous science experiments. The day was finished off with a screening of 'Moana'.

BOP 'Happy Harbour Fun Day' (Photos: BOPRC).

West Coast

Don Neale, Regional Representative

Rough around the edges

The NZCS teamed up with the Engineering NZ West Coast Branch in January to host an evening in Greymouth of three illustrated talks on coastal topics, under the banner 'The Coast – Rough Around the Edges'. Following a similar ENZ regional event about rivers in 2017, around 20 people got along to this informal gathering at Greymouth's Tai Poutini Polytechnic.

The guest speaker was Jaclyne Scally (RCMG), an environmental consultant on a study tour of New Zealand looking at the interactions of river mouths and agriculture. Jaclyne spoke about how river mouth closures are managed in Victoria, and they had remarkable similarities to many of the issues we face in New Zealand. Jaclyne's article about her study tour in this issue of *Coastal News* (page 4) gives us an interesting visitor's perspective on our own patch.

Don Neale (DOC Hokitika) then gave an overview of the 340 river outlets that occur along the 600 km of the West Coast. Outlet mobility and closure are key features of these dynamics landscapes where hazard management and nature protection need to strike a fine balance.

Paulette Birchfield (WCRC Greymouth) gave a pictorial history of the seawall at Punakaiki. This small coastal settlement is threatened by coastal erosion in front and cliff-fall behind, and the seawall is one of the largest coastal protection works in the region.

Jaclyne's visit to the West Coast was topped off with inspections of several river mouth sites south of Greymouth.

Impacts from Cyclone Fehi on the West Coast

Paulette Birchfield WCRC

The combination of the high tide, storm surge, and strong winds, pushed a surge of seawater up the Orowaiti Lagoon east of Westport, to flood Buller High School, the Racecourse, and properties within the township with up to 1 m of seawater. Although now located 1.5 km from the current coastline, this area would have been close to the original coastline prior to the construction of the Buller River Breakwaters in the late 1800s.

North facing corners of headlands and breakwaters along the West Coast were most impacted by the combination of wind and waves – in particular, State Highway 6 at Punakaiki north of the blowholes, and at 17 Mile Bluff. Also impacted was an amenity area north of the Grey River Breakwaters, where 15-20 m eroded from the front face exposing what was underneath – the old Cobden Dump.

Further south at the townships of Okarito and Hunts Beach, the large seas breached the natural sand dunes that help protect the townships. At Okarito several houses were flooded, with up to 1.5 m of water through one house. At Hunts Beach, four houses were flooded.

Erosion along the front of the old Cobden Dump site with the Grey River in the background (Photo: West Coast Regional Council).

Properties at Hunts Beach that were flooded (Photo: West Coast Regional Council).

Southland

Nick Ward, Regional Representative

Regional Coastal Plan reviews

A full review of the Coastal Plan is due to be commenced 26 April. A scoping report was completed in March 2017, with indicative analysis of how much work is required, timeframes, and budget. Phase 1 of the project will be establishing the strategic direction for key issues around the coast.

For more, contact Fleur Matthews (fleur.matthews@es.govt.nz).

NZCPS

The Coast and Biodiversity Chapters of the proposed Southland Regional Policy Statement include provisions to give effect to the NZCPS. The Coast Chapter is still under appeal, but the Biodiversity Chapter was finalised in late 2016.

For more, contact Fleur Matthews (fleur.matthews@es.govt.nz).

Marine Biosecurity

The Fiordland Marine Pathway Plan under the Biosecurity Act 1993 is now operative. The Plan will require all vessels entering Fiordland to have a Clean Vessel Pass and to meet clean vessel and clean gear standards to prevent marine pests spreading to Fiordland.

For more, contact Fleur Matthews (fleur.matthews@es.govt.nz).

Coastal hazards (erosion, inundation)

Environment Southland has commenced work on a Regional Natural Hazards Management Strategy. This will involve identifying gaps in our knowledge, addressing those gaps, implementing required amendments to the Proposed Regional Policy Statement and District Plans, and improving the community's access to natural hazards information.

We are in ongoing discussions with Invercargill City Council about upgrades to stopbanks around the Waihopai River to provide better protection from storm surge events and sea level rise. It has been

suggested that a working group be established to ensure upgrades are coordinated and achieve an appropriate standard of protection.

For more, contact Gavin Gilder (gavin.gilder@es.govt.nz).

Additionally we are exploring the possibility of coastal erosion monitoring starting around 2019. For more, contact Nick Ward (nick.ward@es.govt.nz).

Monitoring

We will continue ongoing estuarine monitoring which looks at fine scale (sediment quality and infauna quality) and broadscale mapping (seagrass, macroalgae and hypoxic areas). We will bring more of this in-house into the future to gain greater control and awareness. Furthermore we will continue sediment plate monitoring and create more transects to monitor muddiness changes over time.

For more, contact Nick Ward (nick.ward@es.govt.nz).

Estuary resource management

Approaches have been developed that may enable significant steps towards estuarine management. This relies on load condition response relationships to be identified. This work is currently being reviewed and is at initial stages. Once publicaly available, it will be shared with the wider members of the society.

For more, contact Nick Ward (nick.ward@es.govt.nz).

Central government news

Sarah McRae, Central Government Liaison

Climate Change Adaptation Technical Working Group Stocktake report

The Climate Change Adaptation Technical Working group was appointed by Government in 2016 to provide advice on options for adapting to the effects of climate change. The group is made up of technical experts across the public and private sectors. A Stocktake report was released in December 2017 and summarises the expected impacts of climate change on New Zealand over the medium and long term, takes stock of existing work on adaptation, and identifies gaps in New Zealand's current approach. A further report to Government on adaptation options is due shortly. https://www.mfe.govt.nz/climate-change/what-government-doing/adapting-climate-change/climate-change-adaptation-technical

South-East Marine Protection Forum final report

The South-East Marine Protection Forum provided its final report on marine protection on the South Island's south-east coast to the Ministers of Conservation and Fisheries in March 2017. https://south-eastmarine.org.nz/2018/03/07/public-release-of-sempf-recommendations/#respond

Marlborough Sounds salmon farm relocation

The Minister of Fisheries has released the report and recommendations from the Marlborough Sounds Salmon Farm Relocation Advisory Panel on the relocation of salmon farms in the Marlborough Sounds. The final decision by the Minister is expected later in 2018. https://www.mpi.govt.nz/news-and-resources/consultations/marlborough-salmon-relocation/

New coastal hazards guidance from MFE and DOC

In December 2017, MFE and DOC released two large pieces of central government guidance on coastal hazards.

MFE Coastal hazards and climate chance guidance for local government

This is aimed at supporting decision makers to manage and adapt to the increased coastal hazard risks posed by climate change and sea-level rise. See the summary and detailed technical versions, prepared by a consortium led by NIWA, at: www.mfe.govt.nz/publications/climate-change/preparing-coastal-change-summary-of-coastal-hazards-and-climate-change

DOC Coastal Hazards Guidance

This explains the coastal hazards policies of the New Zealand Coastal Policy Statement 2010. www.doc.govt.nz/about-us/science-publications/conservation-publications/marine-and-coastal/new-zealand-coastal-policy-statement/policy-statement-and-guidance/

Review of the effect of the NZCPS 2010 on RMA decision making

A report from DOC to the Minister of Conservation on its review of the effect of the NZCPS 2010 on RMA decision making was released in February 2018 in two volumes: 'Overview' and 'Background information', available at: www.doc.govt.nz/about-us/science-publications/conservation-publications/marine-and-coastal/new-zealand-coastal-policy-statement/

NZCS Mission Statement

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 currently has over 400 members, including representatives from a wide range of coastal science, engineering and planning disciplines, employed in the engineering industry; local, regional and central government; research centres; and universities.

Membership applications should be sent to NZCS Administrator Renée Coutts (nzcoastalsociety@gmail.com).

NZCS website updated

The updated New Zealand Coastal Society website is now online at https://www.coastalsociety.org.nz/ We have maintained all of the basic functionality and content from the previous site, but with an updated look and feel. We have also updated and cleaned up the content from the drop down menus across the top of the page. The main improvement to the website is better integration with the NZCS' social media channels (Facebook, Instagram and Twitter). This shows up as a continuous scroll across the opening page. Below the social media scroll is our news section, which is where we will post information regarding important matters related to the society. Below this is a 'Featured Member' section where Coastal Society members are randomly selected to be featured on the page.

We are also working on a fully updated and integrated Member's Directory. This feature is not live yet, but we hope to have it completed in the next month or two. This member directory will be a great way for members to elevate their professional profile in the area of coastal science and management.

Finally, we have also updated the 'Publications' section. Here you can find all of the back issues of *Coastal News* (going all the way back 1993 and Issue #1!) as well as download pdf copies of NZCS special publications. One other planned addition to this section is to add a searchable index of all *Coastal News* articles that have been published since 1993. This should be added to the site in the next month or two.

As with all things 'cyber' the web site is a fluid document and a continuous work in progress. So, if you see any typos that we have missed or other errors, please let us know by sending an email to: nzcoastalsociety@gmail.com.

The New Zealand Coastal Society would like to acknowledge our corporate members for their support:

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Back issues and special publications

Back issues of *Coastal News* (from the first issue in 1993 onwards) are available to download from the Society's website at www.coastalsociety.org.nz. From here you can also download pdf copies of the two NZCS special publications (the 2014 *Rena: Lessons learned* and the 2016 *Adapting to the consequences of climate change: Engaging with communities*), or obtain printed copies by emailing your request to nzcoastalsociety@gmail.com.