



Students and helpers at the big drifter experiment on Tairua Beach last summer. Photo: Dean Sandwell.

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The Coastal Marine Group, Five Years on...

By Karin Bryan with help from the group, University of Waikato

The Coastal Marine Group at the University of Waikato has just passed a landmark 30-year birthday, with nearly five years since our dynamic founder Terry Healy finally lost the last battle with cancer in July 2010. While alive, we challenged and braved his dominant personality. Now that he has passed, we realise how much he fought for opportunities to move our group and coastal marine science in New Zealand forward. We take this moment to reflect on where we are now, and find with some new blood, we are still surging ahead but more as a collective of like-minded individuals rather than with one leader.

Key initiatives

A major new initiative within the group has been the multi-year INTERCOAST international joint graduate school with the University of Bremen and Senckenberg Institute in Northern Germany, the first of its kind at Waikato, and in New Zealand. This programme passed its mid-point review with flying colours last year.

Another initiative was the opening of the Coastal Marine Field Station in Tauranga, and the appointment of the Bay of Plenty Regional Council Chair in Coastal Science, Chris Battershill, as its director. The *Rena* recovery programme followed soon afterward and it was a major achievement for Chris to bring together a diverse range of people to provide the best possible solution to mitigate the environmental effects of the *Rena*. The recently appointed Julia Mullarney has joined the group, bringing vital skills that link our ecology and physical-based research. Chad Hewitt, Marnie Campbell and Bethany Fox also recently arrived from Australia and Otago, which we hope will open up new avenues of research in biosecurity and marine sedimentation.

Marine geology

The lifeblood of the Coastal Marine Group has always been its contribution to applied real-world problems and its strong association with the Port of Tauranga. Willem de Lange has largely taken over the applied marine geology area and plays an increasing role in expert hearings on coastal erosion and port and harbour activities.

Together with Willem and Chris, Dirk Immenga has driven the purchase of the new multibeam, which is the cornerstone of our marine geological research and consulting. Andi Ramli and Mariana Cussioli are undertaking their PhD projects around the monitoring requirements of the dredging consents for the Port of Tauranga.

Summer scholarship research by Amy Christophers and Aroha Hughes used a Knudsen Sub-bottom Profiler (seismic reflection) to identify possible areas of silty Pleistocene volcanoclastic sediments that could be disturbed during capital dredging. These sediments could generate turbid plumes (for example, the white plume that occurred during the 1992 channel deepening). Amy moved on to a masters examining the evolution of the cusped foreland and sedimentation issues at the wharf and boat ramps at Omokoroa.

Tauranga Harbour

The effects of run-off from the Port of Tauranga is the subject of Nadine Brunschweiler and David Culliford’s master’s research while Julia Mullarney and Nick Ling (University of Waikato Biological Sciences) and postdoc Phil Ross are investigating changes to seagrass distribution around the port.

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A look through the go-pro with Mariana Cussioli and Nadine Brunschwiler collecting samples around the Port of Tauranga. Photo: Dirk Immenga.

Multidisciplinary projects are increasingly the future of coastal applied science, and there is no better example than the Bay of Plenty Regional Council funded PhD projects of Alex Port, Julien Huteau and Clarisse Neimand on human impacts on Tauranga Harbour (such as the dynamics and decomposition of *Ulva*), which have required numerical modelling, isotope geochemistry and a lot of field work to solve this complex problem.

Our coastline

Stability of coastlines has become a greater interest within the group with Vicki Moon moving more into marine research. The Bramley Drive landslide (Omokoroa, Tauranga) is also the focus of a long-term monitoring programme as part of INTERCOAST. One PhD looking at the use of a new vibrating cone penetrating test (CPT), known as GOST, has been completed by Ehsan Jorat, and a new project is underway with Max Kluger involving an improved LOI-Vibro-crawler CPT. This project will also use a series of buried piezometers installed in the landslide headscarp by Ehsan 18 months ago.

Vicki and Willem are also running a digital inclinometer and three-axis high-precision seismometer to record displacements. They have identified that solid earth tides are causing significant flexing of the material above the landslide, which has implications for the use of inclinometers for measuring displacements in similar materials around New Zealand.

Camilla Garae is developing a methodology for predicting the erosion hazard for coastal cliffs in relatively soft volcanoclastic materials that can be applied around Tauranga Harbour and also in Vanuatu.

Coastal ecosystems

Coastal ecology research is continuing to grow within the group. Conrad Pilditch's research interests focus on the structure and functioning of soft sediment ecosystems.

In coastal and estuarine systems during the past several years we have been particularly interested in how the behaviour and diversity of benthic fauna contribute to ecosystem productivity. Our group has

worked very closely with long-term collaborators at NIWA (Judi Hewitt, Drew Lohrer and Carolyn Lundquist) and University of Auckland (Simon Thrush) who have provided funding and opportunities for participation in large-scale experimental studies.

The results of our research have generated a series of published studies by PhD students Hannah Jones and Hazel Needham that have provided new insights into the ecosystem functions carried out by crabs and cockles and how the loss of these species can potentially impact system productivity. Recent PhD graduate Dan Pratt has extended this work, demonstrating the direct consequences of biodiversity loss due to increasing mud content in estuaries on ecosystem processes that underpin many of the attributes we value.

Our recent efforts have addressed another important stressor in coastal ecosystems – that of nutrient addition. Current PhD students Emily Douglas and Rachel Harris, along with master's student Laura Hines, have participated in collaborative experiments in the Manukau and Kaipara harbours looking at the role of benthic diversity in regulating the ecosystem response to nutrient additions.

PhD candidates Clarisse Neimand and Rebecca Gladstone-Gallagher (the 2014 NZCS Scholarship recipient) are investigating the role of macrophyte detrital additions in soft sediment ecosystems in an attempt to understand how changes in the area of seagrass beds, amount of *Ulva* and mangrove forests



Benthic ecology in action – detritus experiments. Photos: Rebecca Gladstone-Gallagher.

may impact adjacent habitats. During the past several years, PhD student Virginie Dos Santos has also conducted research understanding the grazing impacts of swans on seagrass beds. Master's student Jordan Cooper has looked at how juvenile snapper use seagrass habitats as a refuge from flow.

With Ian Hogg and former PhD students Phil Ross and Max Knox, we have conducted genetic research documenting the connectivity among New Zealand's coastal benthic populations. New PhD student Bradley Monaghan will be conducting numerical simulations of larval dispersal to better understand the source and sink dynamics in our estuaries. Conrad's research is underpinned by the capable field help of technicians Dudley Bell and Warrick Powie.

Back to tradition – coastal geomorphology

Coastal geomorphology has not lost its place, with projects on the infilling of estuaries, the controls on spit and ebb-tidal delta stability, and beach erosion. Shawn Harrison and Stephen Hunt are nearing completion of their PhDs, in which they have been studying the non-linear feedbacks that lead to the development of estuarine and inlet morphology, with Raglan as their main field site. The video imagery and LiDAR data collected by Waikato Regional Council is critical for these projects. This work was initiated in Barend van Maanen's thesis with Karin Bryan and Giovanni Coco, and we hope to continue on with this work when Giovanni returns to New Zealand to take up a position at the University of Auckland.

Justin Walker is using a similar theoretical framework to understand the complex dynamics of spits and inlets and, with the support of Waikato Regional Council, will use Mercury Bay and Buffalo Beach as his research sites.

INTERCOAST students Brice Blossier and Chris Daly just finished a large field programme at Tairua investigating the controls on rip currents and rotation.



GOST being deployed around the Port of Tauranga. Photo: Vicki Moon.



The seabed around Raglan Harbour entrance. Produced by Shawn Harrison using multibeam data collected by our team, DML, and LiDAR and airphotos from Waikato Regional Council.

Amir Emami and Justy Park are working on the multiple causes of coastal erosion and accretion on Ngarunui Beach. One of the critical drivers of coastal erosion is, of course, the complex wave climate around New Zealand, which is modulated by climatic fluctuations, such as the Pacific Decadal Oscillations. Initiated by work and conversations with Keith Smith and the late Vernon Pickett, PhD student Victor Godoi will study these with the help of Richard Gorman at NIWA.

Our marine research – on the international stage

Our research has taken an entirely new turn, with the funding of a large project by the Office of Naval Research (USA) in the Mekong Delta in Vietnam. Julia Mullarney and Karin Bryan have a project that investigates the development of tropical mangrove swamps in monsoon and non-monsoon conditions, which will have the help of new PhD student Ben Norris and technician Dean Sandwell. This builds on work that Julia conducted on wave attenuation by estuarine vegetation at the University of Washington and new work on the movement of kelp that she is conducting with Conrad Pilditch along the Otago coastline. Her master's student, Holly Bredin-Grey, will start a project in collaboration with Conrad and Drew Lohrer of NIWA investigating flow around crab burrows. Julia and Karin are also working in close collaboration with Iain MacDonald and Mark Pritchard of NIWA on turbulence, sedimentation and flocculation processes, particularly in the Kaipara River.

In conclusion, our group is gradually evolving to reflect the political drivers of coastal policy and the gradual changes to environmental pressures along the coast, but we still very strongly believe in the ideals of international connectivity but local relevance that Terry valued so much. Our coastline represents a perfect laboratory to study internationally significant problems!

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Rere ki Uta, Rere ki Tai – From Land to Sea: 2014 NZCS Annual Conference

By Jose Borrero, NZCS Management Committee

Well it's coming soon (a bit too quickly for the organising committee) but have no fear, we will make sure this year's New Zealand Coastal Society annual conference is one to remember!

The response to the call for abstracts was excellent with more than 50 submissions for oral presentations and close to 20 posters. As a result, we will be running three streams of oral talks on most days and we plan to have a truly interactive and engaging poster session during the breaks between the conference sessions. The conference will also feature four panel discussion sessions covering topics such as marine resource extraction, harbour and catchment management issues, coastal community infrastructure, and coastal hazards management.

Besides just coming to the conference, we really hope you will consider sticking around Raglan for the weekend. Raglan and the surrounding areas have lots to offer and there are so many neat things to see and do. If you are coming from other parts of the country and haven't been to Raglan before, it would be a shame NOT to stick around and see some of it!

As for the schedule, it will go something like this:

Tuesday, 18 November, 6:00 pm: Conference icebreaker and cocktails at Orca Restaurant. This is a great spot at the foot of Bow Street with a good view of the harbour and sunset.

Wednesday, 19 November: Plan on an early start with a conference welcome and our first keynote

address by Angeline Greensill who is a prominent local activist and community leader. This will be followed by a full day of presentations and posters. That evening we will carry on the tradition from Hokitika with a MOVIE NIGHT where we will be screening a locally produced, award-winning documentary, as well as other short selections for your viewing entertainment.

Thursday, 20 November: It will be another early start with a keynote presentation by Doug Booth from the University of Otago. He will be giving an entertaining and engaging talk on the history and social aspects of how people live *with* the beach. This will be followed by a morning full of presentations, poster sessions



While this year's conference schedule is full, we'll also make sure you have time to get out and enjoy Raglan's coastal environment. Photo: Jose Borrero.

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New Zealand Coastal Society

From Land To Sea
Rere ki uta, Rere ki tai



Raglan Whaingaroa Aotearoa New Zealand

22nd Annual Conference November 18-21, 2014



The field trips on Thursday, 20 November, will be a good opportunity to learn more about Raglan's coastal environment. Photo: Jose Borrero.

and the first of our panel discussions. We will then provide you with a box lunch to prepare you for one of our two field trip options.

Field trip #1 gets to the heart of this year's conference theme Rere ki uta, rere ki tai (from land to sea). We will take you by bus from Raglan's scenic ocean overlooks up the catchment to visit vital parts of a coastal watershed. Along the way, we will be led by a representative from the Whaingaroa Harbour Care Group, which for the past 20 years has led the country in efforts to promote and implement riparian planting in an effort to improve the overall ecology of New Zealand's waterways.

Field trip #2 will be a walking tour along Ngarunui Beach and the Whaingaroa Harbour foreshore. We will start at the Ngarunui Beach overlook and take the track down to the beach and along to the entrance of Whaingaroa Harbour. The walk will stop at points of interest along the way where we will learn from local experts about issues of social, historical, and environmental significance.

The day will end with the traditional conference dinner featuring live music entertainment in a beautiful coastal setting.

Friday, 21 November: The final day will start with a keynote address by Donna-marie Audas of Australia's Great Barrier Reef Marine Park Authority who will present on the landscape scale understanding of the Great Barrier Reef catchment and its role in the health and resilience of the Great Barrier Reef. This will be followed by our final sets of conference presentations and panel discussions. Unlike other years, this year we will close the conference with a buffet lunch with some closing remarks. For those of you who must leave, we have scheduled the conference closing such that you can still make it to Hamilton Airport and get connecting and direct flights to Wellington, Christchurch or Dunedin.

So there you have it, we really hope to see you in Raglan!

Visit www.coastalsociety.org.nz/conference2014 for more information.

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Every Now and Then – Porirua Stream

by Don Neale, NZCS Management Committee

If I could start my coastal career over again, one thing I would do is take more photo-points of coastal places that are likely to change over my lifetime. They can really tell the story of our dynamic coasts.

So what's the best "Every now and then" pairing of coastal photos that you've taken? Send them to dneale@doc.govt.nz and we will put some of the best ones in *Coastal News* (with credit to you of course!).

This contribution from Keith Calder, Porirua City Council, shows the Porirua Stream delta in 2008 before a significant investment was made in cleaning up the macrorubbish (drums, shopping carts, cones, tyres) in 2009 and the implementation of an ongoing maintenance regime as part of the *Porirua Harbour and Catchment Strategy and Action Plan*.



Porirua Stream delta in 2008 before clean-up and restoration work began. Photo: Keith Calder.



Porirua Stream delta in 2009 following major clean-up efforts. Photo: Keith Calder.

Hauraki Gulf Forum Update

In late September, the Hauraki Gulf Forum released its 2014 state of the environment report.

The three-yearly assessment of the Hauraki Gulf shows that some environmental improvements have occurred since 2011, but the cumulative impact of all activities is negatively affecting the gulf's environmental values. As poignantly noted in the report's introduction, "Overall, the natural resources of the Hauraki Gulf and its catchments have had a relatively short but unenviable history of unsustainable utilisation."

The report starts with an update on the changing social, environmental and operational situation that affects the Hauraki Gulf. Current and changing pressures are summarised, along with changes to the management framework and significant management decisions that have been made since 2011.

Key environmental indicators are also reviewed, including: fishing; toxic chemicals; nutrients;

microbiological contamination (pathogens); sediment; introduced marine species; harmful algae, pathogens and mass mortalities; litter; maintenance and recovery of biodiversity; and coastal development.

The report then looks at the actual and likely outcomes of current management approaches in relation to the strategic issues identified by the Hauraki Gulf Forum and the degree of integration between management agencies.

The Hauraki Gulf Forum advocated for the development of a marine spatial plan for the gulf after its 2011 assessment. The resulting Sea Change – Tai Timu Tai Pari process is now underway (see News from the Regions page 12).

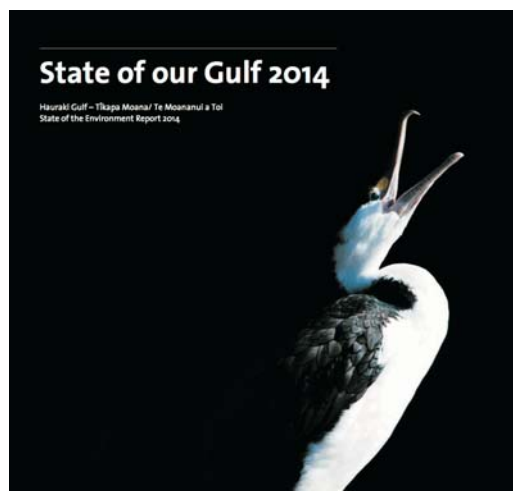
The report states, "It [Sea Change – Tai Timu Tai Pari] provides an opportunity to take a fresh look at the management of the Gulf, and will hopefully provide a roadmap towards environmental improvement. However, addressing the combined effects of a suppressed environmental state, multiple and cumulative impacts, and high and increasing pressure will be technically and politically challenging. The ability of Sea Change – Tai Timu Tai Pari to halt and reverse environmental decline is therefore uncertain, and it is likely that other complementary actions will also be required."

The *State of our Gulf 2014* report is available at www.haurakigulfforum.org.nz.

The report and its implications will be the subject of the 2014 Hauraki Gulf Marine Park Seminar "On the Horizon" on 20 October at Auckland Museum.

Visit www.aucklandmuseum.com/whats-on/series/on-the-horizon-hauraki-gulf-marine-park-seminar.

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Central Government Update

Public perceptions of aquaculture

In August, the Ministry for Primary Industries (MPI) released the results of a survey asking New Zealanders what they think about our aquaculture industry.

Of those surveyed, 73 per cent had positive views of aquaculture and 91 per cent agreed New Zealand should look for opportunities to sustainably grow the industry.

MPI commissioned Colmar Brunton to design and undertake the survey to provide the government with independent data.

Results of the survey are available at mpi.govt.nz/news-resources/news/survey-shows-kiwis-support-for-aquaculture.

EPA grants two marine consents

In August and September, the Environmental Protection Authority (EPA) granted two marine

consents. They are the first two applications to be processed and granted by the EPA under the non-notified provisions of the Exclusive Economic Zone and Continental Shelf Act.

The first to be approved was an application by OMV New Zealand for its Whio-1 exploration well in the Taranaki Basin. The second approval was for an application made by Shell Todd Oil Services Ltd to continue its exploratory drilling operation at the Ruru-2 and Maui-8 exploration well sites within the South Taranaki Bight.

OMV New Zealand has also lodged an application for a marine consent to complete their development drilling programme in the Maari field. The submission period closed on 29 July. Hearings are to be held in Wellington, Nelson and New Plymouth from 29 October through to mid-November.

To learn more visit www.epa.govt.nz.

Coastal Plant Fact File: Pingao

By Paula Loader

In upcoming issues of Coastal News we plan to feature some of the coastal plants of New Zealand, particularly those that are used in dune restoration.

The distinctive, brightly coloured pingao (*Ficinia spiralis*) is a native sand-binding plant that has become something of a symbol of change in the management of New Zealand's coastal dunes.

Found only in New Zealand and the Chatham Islands, pingao extends long rope-like rhizomes across the sand dunes culminating in clumps of spiky foliage, with brown spiral flowerheads appearing in the spring. The young leaves are a dark green, but as they age and dry out they turn a fiery orange.

Coastal pingao-dominated dune systems are biologically diverse and change constantly as sand accretes and erodes. Wind-blown sand is trapped around the leaves and stems, but some sand movement still occurs creating an assortment of ecological niches in which other native coastal plants become established.

Once found on almost every New Zealand beach wherever active dunes were being formed, pingao quickly declined as people burned off the native vegetation to convert coastal plains to farmland and built towns close to the coast. To make matters worse, pingao is highly palatable and is eaten by a wide range of browsing animals, including cattle, sheep and rabbits. In many places – especially on the west coast – large volumes of sand were released by the loss of native sand-binding species and wind-blown sand encroached onto newly developed farms and townships. This led to the introduction and widespread planting of marram grass (*Ammophila arenaria*) and lupin (*Lupinus arboreus*) in the 1880s. These exotics soon extensively colonised the loose-sand environments in which pingao once flourished. However, the problem of coastal erosion has persisted partly because marram grass tends to build very large, steep foredunes that are prone to large blow-outs following storms and strong wind events.

Led by the Dune Restoration Trust of New Zealand, coast care groups along beaches up and down the



Pingao thriving on mobile foredunes along with spinifex on a Northland beach in August 2011. Photo: M Bergin.

country are propagating and planting pingao, along with a suite of other native coastal plants to restore dynamic, functioning dune ecosystems. The resurgence of pingao in our coastal foredunes during the last two decades has been driven by a desire not only to restore normal coastal function and address coastal erosion in modified marram-dominated dunes, but also to protect and restore native biodiversity. A desire which is underpinned by a resilient tradition of cultural use – pingao is also a valuable weaving resource for Māori.

More information on pingao and other native dune species is available on the Dunes Trust website: www.dunestrust.org.nz.

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Pingao is one of our major sand-binding species found on the seaward face of coastal foredunes. Photo: M Bergin.

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Harmful Algae Experts to Meet

The 16th International Conference on Harmful Algae (ICHA) will be held in Wellington from 27 to 31 October 2014. The theme of the conference is "Advancement Through Shared Science" in recognition of the multidisciplinary nature of the field and the important role that international collaboration has played in the understanding of harmful algal blooms and the mitigation of their effects.

For more information visit www.icha2014nz.com.

“Aotea Fault” Discovered in Wellington Harbour

Scientists have discovered an active fault in Wellington Harbour. The fault, referred to informally as the Aotea Fault, runs in a northeasterly direction for about 2 km in Lambton Harbour and ends about 1 km east of Westpac Stadium.

NIWA marine geologists Philip Barnes, Scott Nodder and Susi Woelz mapped the fault using geophysical techniques as part of the It’s Our Fault research programme led by GNS Science. This multi-year project is a comprehensive study of the likelihood of large earthquakes in Wellington and their impacts on people and the environment, and aims to make the Wellington region more resilient to earthquakes.

The Aotea Fault formed a scarp about 1 m high on the seafloor and is thought to be capable of moderate to large earthquakes in the order of magnitude M6.3 to M7.1. Scientists believe at least two significant earthquakes have occurred on the fault in the last 10,000 years.

The Aotea Fault is part of a series of several dozen geological faults in the Wellington region, many of

which are considered capable of generating a strong earthquake.

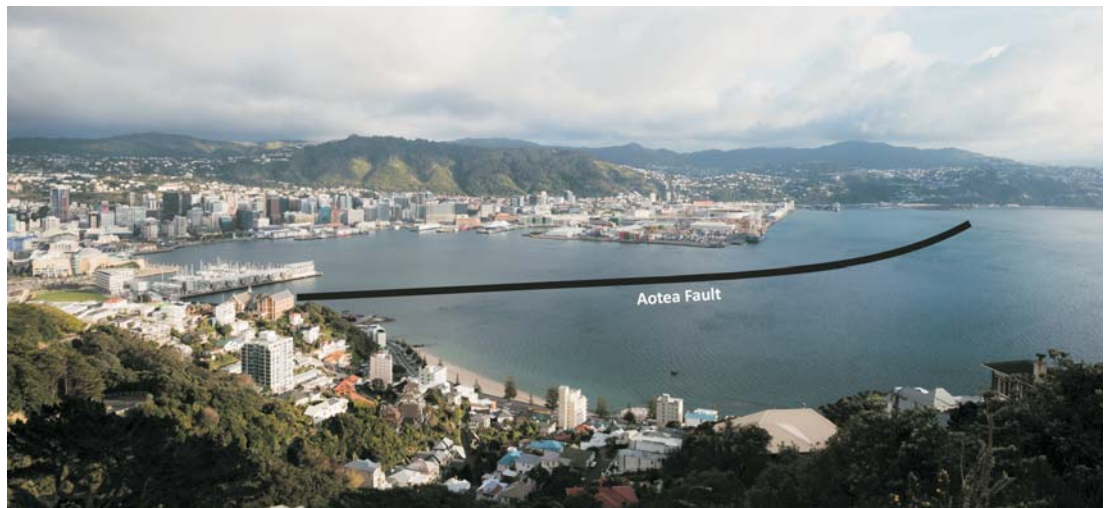
GNS scientist Russ Van Dissen says the fault did not appreciably increase the overall ground-shaking hazard in Wellington.

“Any ground-shaking that this fault could produce is already considered in Wellington’s seismic hazard calculations. So it is already accounted for in the building code,” he says.

When seismologists estimate seismic hazard for a region they typically add “floating faults” to their calculations as their knowledge of all earthquake-producing faults is imperfect.

This “headroom” in the hazard calculations allows for faults that may be hidden or have poor surface expression.

It’s Our Fault is funded by the Earthquake Commission, the Accident Compensation Corporation, Wellington City Council, Wellington Region Emergency Management Group, and Greater Wellington Regional Council.



Aotea Faultline shown in Wellington Harbour. Photo: NIWA.

Sustainable Seas National Science Challenge

In September, the Sustainable Seas National Science Challenge was officially launched. The challenge represents the single biggest investment in ocean-related research for New Zealand.

The challenge is to be hosted by NIWA in partnership with Cawthron Institute, GNS Science, Victoria University of Wellington, and the universities of Auckland, Canterbury, Otago and Waikato.

The challenge is one of 10 Government challenges designed to take a strategic approach to the most important scientific issues facing New Zealand. It will receive around \$31.5 million in new funding over the next five years.

The challenge consists of five key research programmes of Our Seas, Valuable Seas, Māori and

the Sea, Dynamic Seas and Managed Seas.

The challenge’s overarching goals include:

- well-managed and enhanced use of our marine resources;
- a healthy and strong marine economy;
- marine industries operate effectively and responsibly;
- Māori values are included and the Māori marine economy is strong;
- New Zealand as a world leader in sustainable marine production and stewardship; and
- New Zealand society understands and is engaged in marine issues.

Rock 'n' Roll along the Kermadec Arc

Forty rocks recovered from the seafloor along the Kermadec Arc have given scientists a clearer picture of subduction processes occurring off the North Island's east coast.

Analysis of the rocks for about 50 different chemical elements has enabled scientists to build a better model of the way the Pacific plate is being dragged down into the Earth's mantle and recycled into magma and other volcanic products, some of which end up as mineral deposits on the seafloor.

The multi-year study, involving scientists from New Zealand, Australia, Germany and the United Kingdom, has shown that the chemical makeup of seafloor volcanic chains is strongly influenced by the chemistry of the subducted tectonic plate.

A key part of the study was looking at isotope ratios of various elements in the rocks gathered from the seafloor. Scientists used high-precision mass spectrometry to measure ratios of strontium, lead, and neodymium isotopes to give telltale signs of different processes occurring during plate subduction.

The seafloor rocks are all volcanic in origin and were found in or near some of the 30 submarine volcanoes between the Bay of Plenty coast and Monowai volcano, about 1200 km northeast of Whakatane. The study was published in the international journal *Nature Communications* in September.

"We've found that the chemistry of the downgoing tectonic plate influences the type of submarine volcanism and possibly the type of mineral deposits that are formed on the seafloor," says lead author and marine geologist, Christian Timm, of GNS Science.

Christian says a 20-km thick section of the Pacific plate, known as the Hikurangi Plateau, was "consumed" as it descended beneath the Australian plate east of the North Island.



Project lead and marine geologist Christian Timm, GNS Science, with one of the volcanic rocks collected from the seafloor along the Kermadec Arc.

As well as being unusually thick, the Hikurangi Plateau is fluid rich. More fluid in the Earth's mantle beneath volcanic arcs induces more molten rock. This means we have a very productive part of the Earth's crust off the New Zealand coast with this highly active chain of seafloor volcanoes. They erupt often and produce a lot of volcanic material.

The Hikurangi Plateau is about half the size of France and sits at the bottom of the ocean east and northeast of the North Island.

Christian describes the subduction of the Hikurangi Plateau as counter-intuitive. "Nowhere else in the world is such a large and thick block of oceanic crust subducting like this."

He says the study has highlighted the way that the chemistry of the downgoing plate and its effects on seafloor volcanism will have far-reaching implications for hazards and the economic potential of the submarine volcanoes above the plate interface.

www.nature.com/ncomms/2014/140917/ncomms5923/full/ncomms5923.htm

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Digital Atlas to be Developed for Oil/Gas Exploration

Geologists will produce a series of freely available digital maps and a comprehensive database over the next four years to help exploration companies pinpoint prospective areas to explore for oil and gas in New Zealand's offshore territory.

The result will be an extensive body of information showing the current geological understanding of New Zealand's 18 mostly offshore petroleum basins.

The four-year project, led by GNS Science, has been awarded funding of \$500,000 a year in the latest

Ministry of Business, Innovation and Employment funding round.

The project's main output will be a workstation-ready digital atlas made up of multiple layers of information, such as sediment thickness, reservoir architecture, and source rock distribution in a geographic information system format. Project milestones will be released in stages through delivery tools, such as GNS Science's Petroleum Basin Explorer web portal and as data packs.

For more information visit www.gns.cri.nz.

Contributing to Coastal News

We always welcome contributions for forthcoming issues of *Coastal News*. Please contact the Editor, Shelly Farr Biswell, at shelly@biswell.net if you'd like to submit a news in brief, article, or have content suggestions. The submission deadline for the next issue is 20 February 2015.

Chair's Message – Considering Sea-Level Rise

by Rick Liefing, Chair

Coastal News



The countdown is well and truly on for the annual conference in Raglan. If you haven't had a chance to look at what is on offer, please head to our website now, remember early bird registration ends on 17 October.

Once again a dedicated team has been assembled for the local organisation committee. It amazes me that although we hold these conferences for our members once a year, there is always so much enthusiasm by the organising committee to make the conference even "better" than the year before. Yes, there is a general formula that seems to work well, but each location brings out unique aspects that you just can't replicate. Raglan is no different and will be a special event not to miss.

One of the topics that I have been grappling with at work is sea-level rise. I am sure I am not the only one! While there is some conjecture in the coastal community – here and overseas – on the rate of sea-level rise (SLR), what is clear is that it's happening and is projected to continue past the 100-year planning timeframe.

There are some very major implications for all New Zealanders on the effects of SLR. Because let's face it, at some point in time, owners of existing coastal property will lose out. They will lose either by physical loss, loss of insurance and mortgage due to increased risk, or loss of use rights due to regulatory regimes.

Is the New Zealand public OK with this? Do they know of the SLR implications? Do they care and think it is "not in my life time"? Are we as coastal professionals doing enough to inform the public?

Many regional and territorial authorities are reviewing statutory documents currently or soon will be. My

concern is that the public will see some of the prudent planning that is happening around New Zealand to address the implications of SLR (and climate change in general) as being draconian. Yes, there will be people affected with possible loss of value for their coastal property due to regulatory changes limiting investment potential.

The possible public backlash may put heat on politicians, who may put heat on council staff, which could cause short-sighted decisions to be made regarding long-term management.

However, if we are not addressing SLR appropriately now, New Zealand will be dealing with a much bigger issue in the future with many more members of the public losing out. This is where we need some further direction, accountability and resources from central government in combination with further public education on the issue.

Ideally, with more central government input, regional and territorial authorities will be given the mandate to make these challenging decisions within their statutory documents. Along with the public's increased knowledge of the issues concerning SLR, perhaps there will also be less pressure put on the decision-makers. The end result is a more resilient coastal community.

In a hundred years, what if SLR turns out to be less than current projections and we have large coastal setbacks? Would that be a bad thing?

Anyway, that's my two cents worth and doesn't represent the views of the NZCS. Look forward to discussing SLR and other coastal issues with all of you – in both formal and less formal (with beer in hand) settings at the conference.

Onwards and upwards.

Vision Mātauranga – Supporting Marine Guardians

Recent Otago Marine Science MSc graduate Peri Subritzky will travel around the country undertaking stock assessments for key marine species and determinations of key environmental and habitat characteristics. He will be mentored by Chris Hepburn of the University of Otago and work in partnership with scientists and environmental managers from Ngāi Tahu's customary fishery unit.

The programme is being funded through the Government's Vision Mātauranga Capability Fund.

The work aims to provide tangata whenua, kaitiaki (guardians) and customary management areas (CMA) committees with training, tool kits and baseline information to support management decisions within their rohe moana (coastal area).

"Experience shows that scientific data is key in allowing CMA managers to make decisions and

convince other stakeholders, for example, fisheries industries and government, that change is required. Importantly, science can be guided by and build on mātauranga Māori allowing for better decision-making and restoration of the sustainability of coastal fisheries," Chris says.

In the first year of the programme, the survey design will be deployed within the Ngāi Tahu Takiwā and in the second year it will be expanded to include the North Island. A simplified surveying regime will be developed for tangata whenua to independently assess trends in stock densities over time and provide feedback for management committees thus supporting Māori communities and kaitiakitanga in a way that is specific to each rohe.

To learn more visit www.mahingakai.org.nz and www.takiwa.org.nz.

News from the Regions

Northland

Michael Day, Regional Coordinator

Plan reviews

All three of Northland's regional plans prepared under the Resource Management Act 1991 (Coastal, Air Quality, and Water and Soil) are now 10 years old and are due for their statutory review. Rather than reviewing each plan separately, the regional council has decided to review them simultaneously and divide the review into 10 topics. Of relevance are coastal water space, natural hazards, marine ecosystems and biodiversity, and water quality.

The regional council has prepared draft review summary reports that outline ideas for how the plans can be improved. The reports can be found at: www.nrc.govt.nz/Your-Council/Council-Projects/New-Regional-Plans/10-year-review-of-the-regional-plans/.

There will be workshops with key stakeholders in October, with the intention to have the review finalised by the end of 2014 so that drafting a new regional plan or regional plans can begin in 2015.

Moorings and Marinas Strategy

Northland Regional Council's Moorings and Marina Strategy, which has been drafted to give more certainty about the way moorings and marinas will be managed in Northland over the next 20 years, was signed off by Northland Regional Council in August. More than 140 people and organisations submitted on the strategy, with public hearings held at Opuia in April.

Key points of the strategy are:

- a set of principles to ensure a regionally consistent approach to marine space use;
- a decision-making guide to determine the best way to manage future growth in discrete areas like the Bay of Islands;
- a policy to ensure fair allocation of marine space – including compensation – where intensification (for instance a new marina) is proposed in an existing mooring area;
- a proposal to increase council ownership of moorings to enable more effective management of Northland's moorings;
- identifying where and how moorings and marinas will be provided for in the Bay of Islands, where regional demand for mooring space is currently highest; and
- a policy aimed at increasing the occupancy of moorings.

The Northland Regional Council will now roll out a number of operational initiatives stemming from the strategy, including trialling some new mooring technologies. Many of the strategy's key points, however, will be largely implemented through the regional council's new Regional Coastal Plan, with drafting expected to begin in early 2015.

The strategy can be viewed at www.nrc.govt.nz/mmstrategy.

Pest management

Northland's Regional Pest Management Strategies (RPMS), which includes a dedicated marine pests section, is currently under review. It is anticipated that a new proposed RPMS will be notified around mid-2015. A summary of the main issues and initial ideas and options for improvement can be found on the regional council's website.

During the last winter survey in Whangarei, two new to New Zealand ascidians (sea squirts) were found in Marsden Cove Marina (Whangarei Harbour); one is native to south Australia and the other to North America. Both form large mats and have the potential to smother native species and affect aquaculture. They have died away to very small colonies during the winter, and in November, regional council staff and Ministry for Primary Industries staff will be doing a joint check and response to them. It is most likely that the sea squirts arrived on foreign vessels.

In June 2014, the regional council ran a pilot study to assess the effectiveness of ultrasonic noise on the survival of mature fanworm. The results were found to be encouraging with most of the fanworm having a severely reduced condition score (visual appearance, reaction speed and fan appearance) after 14 days of ultrasonic treatment. The council intends to do a more in-depth field trial of the ultrasonic units in Marsden Cove Marina during the summer.

For more information, contact the regional council's Aquatic Biosecurity Officer Irene Middleton.

Waikato

Christin Atchinson, Regional Coordinator

Technical reports

A number of Waikato Regional Council technical reports have been released recently which include:

- Intertidal habitat mapping for ecosystem goods and services in Tairua Harbour;
- Assessment of the Waikato River estuary and delta for whitebait habitat management: field survey;
- GIS modelling and hydrodynamic modelling; and
- Estuarine vegetation surveys for Purangi Estuary, Kennedy Bay Estuary, Aotea Harbour and Port Waikato.

The reports are available at www.waikatoregion.govt.nz/Services/Publications/Technical-Reports/.

Regional Estuary Monitoring Programme 10-year trend report

Waikato Regional Council's Regional Estuary Monitoring Programme (REMP) was initiated in April 2001 to determine the current status and monitor the temporal changes in the state of selected estuaries

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(Raglan Harbour, southern Firth of Thames, and, since 2012, Tairua Harbour) in the region. A trend report of the first 10 years of monitoring data (April 2001 to April 2011) has been published (www.waikatoregion.govt.nz/tr201441). It provides analyses of trends over this period of time and investigates pattern and features in results that indicate the ecological health of the monitored estuaries.

WaiQTahi – ocean monitoring buoy

The Cawthron Institute is about to install an ocean monitoring buoy in the Firth of Thames. The water-quality buoy, called WaiQTahi is owned and managed by the Waikato Regional Council. WaiQTahi builds on earlier collaborations between Cawthron, the Monterey Bay Aquarium Research Institute (MBARI), and Hawke’s Bay Regional Council in developing the HAWQi and TASCAM systems and will follow the same data exchange protocols and standards and open sharing ethos of the previous systems. As such, it will make a major contribution towards the growing network of coastal ocean observation platforms in New Zealand.

The new system includes a variety of instruments that measure weather, currents, temperature, salinity, turbidity, chlorophyll, and dissolved oxygen. Cawthron continues to develop smaller-scale platforms (nicknamed micro-water quality or WQ buoys) that are most recently being deployed for real-time monitoring in estuaries and coastal waters surrounding Auckland.



WaiQTahi on display at a Cawthron open day prior to its deployment. Photo: Cawthron Institute.

Maritime Services

Waikato Regional Council’s Maritime Services programme (previously known as Navigation Safety) has successfully led two projects that will benefit the Waikato region and New Zealand as a whole.

Marine Mate is a free smartphone app that provides tide, boat ramp, safe boating and local bylaw information, including information on five-knot zones, towing lanes and swimming areas. This project was

a multi-agency venture and included all New Zealand harbourmasters, Water Safety NZ, LINZ, Maritime New Zealand, the New Zealand Coastguard and others. The app has had nearly 19,000 downloads in its first year. It is proving to be a great example of communicating policy information in today’s environment (you can download Marine Mate from your app store).

The programme also managed the production and release of a series of bar crossing education films aimed at saving lives. The films provide general “how to” information for Raglan, Tairua, Bowentown and Kaituna. The films are touting big numbers in their early days on YouTube (head to waikatoregion.govt.nz/barcrossing to view the films). This was also a multi-agency project that included representatives from the Bay of Plenty Regional Council, the New Zealand Coastguard, Water Safety NZ, ACC, Maritime New Zealand, and other organisations.



Lights, camera...filming one of the bar crossing videos. Photo: Waikato Regional Council.

State of Firth of Thames

A project has commenced reviewing information about the current state of the Firth of Thames related to nutrient and sediment loading, phytoplankton, dissolved oxygen and pH (ocean acidification) and the changes over time. This project is planned and funded by Waikato Regional Council in collaboration with Dairy NZ. The work is being undertaken by NIWA and will be completed before the end of this year. It will provide a sound baseline of information, including information on the processes governing ocean acidification and its severity, as well as expert opinion on risk.

Sea Change – Tai Timu Tai Pari

Sea Change – Tai Timu Tai Pari, a two-year project, will develop a new spatial plan for the Hauraki Gulf.

As part of the project, from December 2013 to June 2014, a series of Listening Posts were held around the Hauraki Gulf with particular emphasis placed on connecting with people in small, rarely consulted groups and communities. Listening Posts have now been completed.

The knowledge and ideas captured through the Listening Posts have been summarised into a booklet entitled *The Voices of the Gulf* that is available for

download on <http://seachange.org.nz/SWG-in/Listening-Posts/>.

The Listening Posts will inform the ongoing work of the Stakeholder Working Group (SWG) which has established six issues-based roundtables to break the work into manageable pieces. The issues to be considered by the six roundtables are:

- water quality and catchments;
- fish and fish stocks;
- biodiversity and biosecurity;
- infrastructure and commercial uses;
- aquaculture; and
- accessible gulf – including recreation, boating, heritage and visitors.

These roundtables will be the primary tool for the SWG to progress its detailed investigations on these issues from now until December 2014. The SWG will continue to work on the overarching themes of the ecology, economy and mauri of the Hauraki Gulf.

Each roundtable comprises three or more SWG members, plus other invited participants who have specific knowledge or expertise in the topics under discussion. These individuals represent a range of different stakeholders and mana whenua with an interest in the topic areas and in the Hauraki Gulf. Each roundtable will:

- receive and provide information;
- discuss and debate issues and aspirations; and
- identify options and try to resolve conflicts.

All this will assist the SWG in fulfilling its obligation to produce the Hauraki Gulf Marine Spatial Plan.

To find out more about the roundtables visit <http://seachange.org.nz/SWG-in/Roundtables/>.

To find out more about Sea Change – Tai Timu Tai Pari visit www.seachange.org.nz.

Hawke's Bay

Neil Daykin, Regional Coordinator

Well this will be my last submission as the North Island eastern region coordinator as I'm off to Oz as a coastal planner mid-October. It's been my pleasure contributing to NZCS over the last few years and attending the annual conferences, too many to remember, don't think I've quite reached a decade yet. However, you haven't seen or heard the last of me; I'll be the roving reporter/spy from Oz, giving an Ozstralian perspective on all things coastal, relevant given my new job.

Editor's note: Neil has been one of our stalwart contributors to Coastal News and will be missed. Although, I am already looking forward to his missives from Australia.

Proposed Whakarire Breakwater

A pre-hearing meeting was held in July. The application is currently on hold awaiting confirmation from Napier City Council on how they wish to proceed.

Clifton Motor Camp and seawall

The problems at Clifton Motor Camp continue. Tree stumps and logs have been used in an attempt to slow the erosion losses as shown below, but their access road is still falling into the sea.



The access road to Clifton Motor Camp continues to be eroded as illustrated in the above photos. Photos: HBRC.

Upper South Island

Eric Verstappen, Regional Coordinator

Salmon farm management

The New Zealand King Salmon Co. Ltd (NZKS) with the support of the Marlborough District Council is developing guidelines for best practice salmon farm management in the Marlborough Sounds. The voluntary process is being undertaken by NZKS to ensure that Marlborough has world-leading salmon farming practices tailored to the special environment of the Marlborough Sounds.

Comments are being sought on the draft guidelines. NZKS currently operate eight farms in Pelorus and Queen Charlotte Sounds. These existing farms all operate under different conditions and environmental quality standards as they were consented at different times over the last 15 years.

Over that time, scientific understanding of seabed enrichment effects from fish farming in the Marlborough Sounds has evolved, but consent conditions have remained relatively static. This has resulted in consent compliance being difficult to determine.

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The guidelines will achieve consistency in environmental quality standards and monitoring conditions. Clear benchmarks for environmental performance have been established, with advice from national and international experts. The guidelines provide assurance that salmon farming occurs within the ecological balance of the Marlborough Sounds. A simplified regulatory regime will also contribute to the many benefits Marlborough receives from a well-managed salmon industry.

Scientists, community, industry and government representatives have joined NZKS and the Marlborough District Council in developing the guidelines. Organisations involved included the Cawthron Institute, NIWA, the Scottish Association for Marine Sciences, the University of Tasmania and Aquaculture New Zealand. The Ministry for Primary Industries is also supporting the development of the guidelines.

Comments are due by 5.00 pm Friday 31 October 2014. Learn more at www.marlborough.govt.nz/Environment/Coastal/Salmon-Farming-Guidelines.aspx.

West Coast

Don Neale, Regional Coordinator

New marine reserves on West Coast opened

Five new marine reserves were officially opened in early September on the West Coast to protect a range of marine ecosystems for conservation, science and recreation.

The five reserves – Kahurangi, Punakaiki, Waiau Glacier Coast, Tauparikākā and Hautai – are the first such reserves for the West Coast beyond Fiordland, and



Tauparikākā Marine Reserve. Photo Andris Apse.



Kahurangi Marine Reserve. Photo: Andris Apse.

adjoin three national parks and the World Heritage Area Te Wāhipounamu.

The marine reserves will protect some of the shore and seabed habitats of special marine life, such as Hector's dolphins and little blue penguins, as well as a wide range of fish species and other marine life.

The five new marine reserves were recommended by the West Coast Marine Protection Forum. The forum includes Ngāi Tahu, commercial and recreational fishers, conservationists, tourism operators and council representatives.

The five reserve sites reflect a range of habitats and special examples of the West Coast's marine areas.

Otago

Suzanne Watt and Jamie Torrance, Regional Coordinators

South-East Marine Protection Forum

The South-East Marine Protection Forum (Roopu Manaaki ki te Toka) is well underway with the forum meeting for the third time in Dunedin on 10 September. The forum has been convened by Environment Minister Nick Smith (formerly Conservation Minister) and Primary Industries Minister Nathan Guy to consider what marine protection is needed in the coastal area from Timaru to Waipapa Point.

Appointments to the forum were confirmed in late March with 14 members representing various stakeholder groups, including Ngāi Tahu, commercial and recreational fishing, science, tourism and conservation. The forum is chaired by senior environmental lawyer Maree Baker-Galloway.

The role of the forum is to identify the biodiversity, social, cultural and commercial values that are important to the community. Over the next 18 months the forum will meet with people and consider a range of information about the marine environment. It will then assess this information alongside other considerations and propose marine protected areas to the Government.

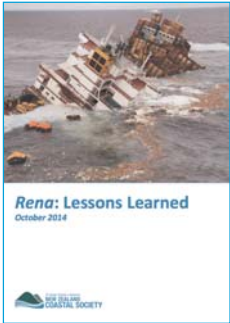
It is expected that the forum will confirm its engagement plans at the next meeting and will then go out to the wider community to hear their views. The next meeting will be held at Puketeraki Marae (Karitane) on 18 October. There will be a public session from 3.00 pm.



South-East Marine Protection Forum members.

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The *Rena* – lessons learned



This month the NZCS published *Rena: Lessons Learned*. The publication complements the growing knowledge base on oil responses in New Zealand. It includes observations on a number of topics ranging from community involvement, to how the wildlife response was

integrated into the overall response, to oil spill modelling. The publication also includes a discussion on the legal implications of the incident.

Since the grounding of the *Rena*, NZCS members have been involved in nearly every aspect of the response,

recovery and environmental monitoring work programme. The NZCS committee would like to acknowledge members and others who have been involved in this challenging work and to commend their efforts.

Annual membership

To provide all the benefits that a NZCS membership offers, and to achieve our organisation's purpose, vision and mission, as discussed at the annual general meeting in 2013 in Hokitika we have increased the NZCS portion of the annual membership fee as of 1 October 2014.

The increase of \$25 is the first increase in the NZCS membership fee since its inception 22 years ago and will raise your total membership fee to \$149.50 (including \$19.50 GST and \$45 IPENZ fee).

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