Coastal News
Te Hunga Takutai o Aotearoa

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Kaipara Harbour (Photo: NIWA)

A New Looking Glass – Unlocking Sediment Records to Understand the Past and Plan for the Future

Shelly Biswell, Editor

While relatively new, the NIWA-developed Compound Specific Stable Isotope (CSSI) dating method is already allowing scientists, planners, and decision makers to gain a fuller understanding of New Zealand's coastal environment and to plan and take action accordingly.

In 2009, as part of the ambitious LINZ-funded Bay of Islands (BOI) Coastal Survey 20/20 project, the CSSI method was applied to help determine when and how sediment deposition had occurred in the region.

NIWA Scientist Max Gibbs says, "We're able to identify the sources of catchment sediments deposited in lakes, estuaries, and coastal waters based on the fundamental principles of stable isotopes. In conjunction with radioisotope dating, the CSSI method has been extended to enable us to reconstruct past sources of soils eroded from the catchment and deposited in the Bay of Islands system."

The radioisotope dating of sediment cores shows that sediment accumulation rates (SAR) have increased tenfold or more since the mid-1800s. "As you'd expect, that rate has accelerated as the population of the region has grown over the last ~700 years and with the subsequent catchment deforestation and conversion to agricultural land use, firstly by Maori for root crops, such as kumara, and later the development of pastoral lands for dairy and dry-stock, and orchards and horticulture in recent decades. With the CSSI dating method we've been able to more precisely identify soil-erosion sources that have persisted over time and to quantify that information in terms of land-use practices."

Effects of sedimentation

As sediment flows into coastal waters it can have immediate, harmful effects on the plants and animals living there. Suspended sediment reduces water clarity which can affect how animals search for food and reduces the amount of light reaching the seabed which can cause seafloor plants to die off. It can also clog the gills of fish and reduce the ability of filter-feeding shellfish to feed. Heavy sedimentation can also destroy crucial nursery habitat for species like snapper, trevally, tarakihi, and blue cod.

A tool for resource managers

While much is known about the potential environmental effects of sedimentation, the CSSI dating method provides better information into sources and timing of sediment deposition – information that resource managers are already

NIWA scientists take coring samples in Kaipara Harbour. Photo: Rod Budd, NIWA.

using when addressing land-use issues and targeting restoration efforts.

NIWA Coastal Scientist Andrew Swales says, "For example, the Northland Regional Council is using the information gleaned from the CSSI dating method to identify areas in the Bay of Islands and Whangarei Harbour where catchment sediments are depositing and how the sources of soils may have changed over time. This new tool provides robust information to identify the land-use practices and sub-catchment areas that are substantially contributing to sedimentation of estuaries and coastal waters. This will enable the council to work with landowners and land users to target its resources and hopefully lead to a reduction in soil erosion from major catchment sources and ultimately a reduction in adverse effects on receiving environments."

The method

The CSSI dating method enables the stable-isotope profiles preserved in sediment cores to be unlocked to identify the original sources of the sediment, and coupled with radioisotope dating techniques, determine when these sediments were deposited.

The method is based on the concepts that:

- land cover is primarily defined by the plant community growing on the land, and
- all plants produce the same range of organic compounds, but with slightly different stable-isotope values because of differences in the way each plant species grows.

The compounds commonly used for CSSI analysis are natural plant fatty acids which bind to the soil particles as labels called biomarkers. While the amount of a biomarker may decline over time, the CSSI value of the biomarker does not change. The CSSI values for the range of biomarkers in a soil provide positive identification of the source of the soil by land-cover type.

Veronica channel at Russell – CSSI method in action

Through the CSSI method scientists have been able to identify when and how sediment deposits have entered into the Veronica channel at Russell. The sediment deposits identified for the ~2000 years prior to human arrival are made up of soils from the erosion of native forest and bracken. The presence of bracken in the deposits indicates that natural disturbance of the landscape, for example fire or landslide, was fairly common even before humans inhabited the area.

"While the sediment accumulation rates were nowhere near the levels of today," says Andrew, "it was a dynamic environment with periods of increased catchment soil erosion and run-off into the sea.

"By the 1850s soils derived from potatoes and dry-stock pasture are detected which is consistent with historical records that show potatoes were introduced by European whalers in the late 1700s. By the 1870s, sediment deposits contain stable-isotope signatures that are indicative of dairying activities."

The CSSI dating method is now being used in the Mangemangeroa catchment to determine when a mangrove forest colonised the estuary. Photos: Andrew Swales, NIWA.

Unlike many other parts of the Bay of Islands where native forests were lost by the turn of the 20th century, the estuarine deposits at this site were largely composed of kauri-forest soils until the mid-1940s when they were replaced by exotic pine forest soils and another sedimentation signature began to appear in the record – citrus orchards.

There are a number of factors that scientists must take into account when using the method, including accounting for the time lag between when land-cover changes are made and when those changes appear in sedimentation deposits. A time lag between soil erosion and deposition may depend on catchment size, where the erosion is occurring in the catchment, and the magnitude and frequency of storms that cause run off.

Looking back, looking forward

The CSSI dating method has been recognised internationally and is revolutionising how scientists investigate soil erosion and sedimentation processes in freshwater and marine environments. In July, Max will be presenting a paper on the extended CSSI dating method to the Food and Agriculture Organization of the United Nations/International Atomic Energy Agency international symposium on managing soils for food security and climate change adaptation and mitigation in Vienna, Austria.

"Because the method can be used not only to identify soil sources, but also to apportion their relative contribution from different land uses in catchments," Max says, "the method also has the potential to support better land-management decision making for sustainable food production in other parts of the world."

Andrew adds, "New Zealand's coastal environment has proven to be an excellent place to develop the method. Large-scale environmental changes, such as catchment deforestation associated with the arrival of people, occurred much more recently here than it did in many other parts of the world. This has allowed us to test under conditions where there are fewer confounding factors and strong sedimentation signatures."

NIWA is now using the method in the Mangemangeroa catchment in Auckland to not only determine changes in soil sources over time but also to reconstruct the development of a mangrove forest that colonised the estuary sometime between the 1860s and 1930s. Scientists hope to be able to reconstruct how the estuary responded to increased soil erosion and at what stage during the infilling of the estuary mangroves arrived and how quickly they spread. A better understanding of processes driving mangrove-habitat expansion will provide planners with insights into how to manage estuaries today.

Funding for developing the CSSI dating method has come from the Northland Regional Council and NIWA's Innovation Seed Fund.

20th Annual NZCS Conference

Making Waves, 20 Years and Beyond

14-16 November 2012 • Royal NZ Yacht Squadron, 101 Curran St, Westhaven, Auckland

NZCS is now calling for papers with abstracts due: 27 July 2012. This year we will be particularly interested in presentations that address one of the themes listed below:

- Coastal management in New Zealand – historical perspectives;
- Unplanned events and natural hazards;
- Management pressure in the 21st century;
- Competing for space – with a focus on the development of Auckland's waterfront, infrastructure giants, the Hauraki Gulf and coastal environment;
- Integrated coastal management; and
- Coastal science – current themes and new directions.

Visit www.coastalsociety.org.nz to learn more or contact the Conference Committee Chair Hugh Leersnyder at hugh.leersnyder@beca.com

NEW ZEALAND COASTAL SOCIETY
Te Hunga Takutai o Aotearoa

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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 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.

Applications for membership should be sent to NZCS Administrator Renee Foster (email: nzcoastalsociety@gmail.com).

PCE to Investigate Fracking

Dr Jan Wright, Parliamentary Commissioner for the Environment.

Initial scoping work being done on hydraulic fracturing is now under official investigation by the Parliamentary Commissioner for the Environment.

PCE Dr Jan Wright, says the preliminary work shows there is a need to examine the issue more closely.

"The work that has been done by my office thus far shows a substantive case for an official investigation under the Environment Act.

"Over the next few months my staff and I will conduct this investigation and produce a report to Parliament.

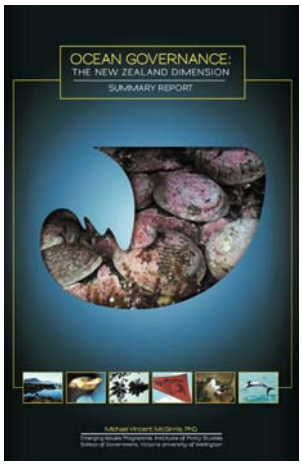
"I realise this is a hugely contentious issue and I would hope to have a report tabled in the House before the end of this year."

Fracking (a common term for hydraulic fracturing) is the process of creating fractures in rocks and rock formations by injecting fluid into cracks to force them further open. The larger fissures allow more oil and gas to flow out of the formation and thus be extracted.

Advocates of fracking point to the vast amounts of formerly inaccessible hydrocarbons the process can extract, whereas skeptics highlight the potential environmental impacts, including contamination of ground water, risks to air quality, the migration of gases and fracking chemicals to the surface, and surface contamination from spills and flowback.

Ocean Governance – Summary Report

Published in April 2012, *Ocean Governance: The New Zealand Dimension* is a summary report from the Victoria University of Wellington's Institute of Policy Studies Oceans Governance project.



Written by visiting American marine policy expert Dr Mike McGinnis, the project's primary goal is to provide interested members of the public and policymakers with a general overview and a description of the types of principles, planning tools, and policy instruments that can be used to strengthen and improve marine governance in New Zealand.

The report provides analysis on New Zealand's existing marine governance framework and factors that influence marine planning and decision-making. Based on the project's findings, the report also makes two overarching recommendations:

1. regional councils should develop integrative marine plans where conflict between users and users-ecosystems is likely to occur in the future; and
2. a new role should be adopted for central government that supports an ecosystem-based approach to integrative marine planning and decision-making.

A full report is to be published later in 2012.

http://ips.ac.nz/publications/publications/show/330

Matt Skellern – A Tribute

Photo: Linda Thompson.

NZCS member Matt Skellern passed away in Tauranga on 7 May 2012.

As a coastal planner and advocate, Matt will be known to many in the NZCS community through his studies at the University of Auckland where he was writing his thesis on international approaches to surf break protection, his work as a planner with Bay of Plenty and Auckland councils, and his work with the Young Planners at the New Zealand Planning Institute. A passionate surfer, Matt was also involved with the work of the Surfbreak Protection Society and was dedicated to protecting New Zealand's significant surf breaks.

Matt's commitment and enthusiasm for New Zealand's coastal environment will be greatly missed.

Matt and Bailey Peryman wrote the cover story for *Coastal News* in April 2011 on the planning tools used for surf breaks. The cover photo for the story (background) by Matt is of surfers at Rocky Lefts, Paora Rd in Taranaki.

Coastal News

Word from the Deputy Chair

by Rick Liefting

Kia ora and welcome to the second edition of *Coastal News* for 2012, this time from your Deputy Chair. I am sure you are all wondering what has happened to the first half of 2012! The reason I am doing this piece, rather than Deirdre, is to focus on regional events, having been the NZCS Regional Coordinator for a number of years, but firstly a quick update on NZCS happenings.

I attended the annual IPENZ forum on behalf of NZCS earlier this year. As most of you will know, NZCS is a Technical Interest Group (TIG) of IPENZ. Essentially IPENZ undertakes the day-to-day administration of NZCS in terms of financials, mail outs, and the email digest. However, IPENZ also provides other services that NZCS uses and we are working closely with them to ensure we get the most of your IPENZ administration fee.

The second NZCS meeting for 2012 was held in Wellington at the Greater Wellington Regional Council buildings. The new recruits on the NZCS committee are bedding in very well and are providing valuable fresh eyes to the NZCS tasks at hand. Unfortunately Denise Young, our DOC representative and a Central Government Coordinator on the committee, can no longer offer her time on the committee. In her place we have Sarah McRae from DOC. So thank you very much Denise for your valued input to NZCS and welcome Sarah to the NZCS committee.

One of the main outcomes from the meeting was to facilitate a special issue of *Coastal News* on the *Rena* disaster. The special issue will collate views from a cross section of people involved in the initial emergency response and the continued clean-up process. The aim is to provide insight into the grounding and identify processes that worked well, could be improved, or were completely lacking. Other tasks the NZCS committee are working on are progressing well. We aim to make some announcements in the months ahead and at the conference.

Speaking of conferences, our 20th annual conference in November is also progressing well under the leadership of Hugh Leersnyder and his enthusiastic team. Hugh and his team have been working hard and looks like it will be another great event! However, a successful conference also depends on you with your attendance or as a presenter. So please book this conference in your diary and we encourage you to present. See the conference ad on page 4.

As Hugh is spending a lot of his time on conference organising, his shared role of NZCS Regional Coordinator will be taken over this year by me. So Jose and I will be helping the coordinators around the region to organise events over the year. In the past, NZCS has facilitated local and international speakers to do roadshows around the regions, which were successful. However, our main issue is identifying who may be available.

So if you know of a visiting/local scientist or practitioner who is keen to see a bit more of New Zealand in lieu of presenting to our members, please let Jose or I know. We can then work with the coordinator(s) in the regions to organise the event. Helping out with regional events is also a great way to be more involved in the NZ coastal community, again contact Jose, your coordinator, or myself to get involved. Feel free to suggest an idea for an event in your region.

Unfortunately we have lost our coordinators in Taranaki and Southland. Thanks so much Erin Zydervelt and Ken Murray for all your input over the years in your roles. Emily Roberts is the new coordinator for Taranaki, welcome aboard Emily! However, we do need a replacement for Ken in Southland, any volunteers?

All the best for the rest of the year. T he next NZCS committee meeting is October 19, please let any of the committee know if there is anything you would like raised.

Coastal News

Coastal News now delivered in PDF format

At the 2011 AGM, members voted that the default distribution of *Coastal News* will be in PDF format and delivered to members via email. When registering with NZCS, members will still have the option to have print copies of *Coastal News* delivered, however, if this option is not selected members will only receive the environmentally friendly PDF version.

Contributions

We welcome contributions for each issue of *Coastal News*. Please contact Shelly Biswell at shelly@biswell.net if you'd like to submit a news brief, article, or have content suggestions. The submission deadline for the next issue is 5 September 2012.

Lessons learnt from the *Rena* – upcoming NZCS publication

The NZCS management committee welcomes members to forward through ideas for a future publication on lessons learnt from the *Rena*. Contact the NZCS Administrator at nzcoastalsociety@gmail.com for more information.

One Species' Poison is Another Species' Meat

Aysha Hohaia and Kay Vopel, Marine Research Group, School of Applied Sciences, Auckland University of Technology

Estuaries are transitional ecosystems connecting the ocean with inland waters and as such they are frequently perturbed by natural causes. Few species can handle the variable physicochemical conditions in estuaries, so species diversity is typically low. We understand high species diversity supports successful ecosystem functioning but estuaries are different; they successfully function because of their low species diversity. In other words, low species diversity is not a problem in these systems, it's an important feature.

Species populating estuaries can achieve high population densities because of reduced competition. Frequent variation in seawater temperature, salinity, and pH, for example, does not present stress for them but an advantage; the stress is in having no variation in these and other physicochemical properties. The dynamic environment of these species, however, is not only shaped by natural processes but increasingly by humans.

Detecting human-induced changes in estuaries is difficult because the response of these systems to such changes is either very similar to that of naturally occurring changes or it does not change structural ecosystem properties such as species diversity. For example, an estuary naturally enriched with organic matter will support organisms and species assemblages very similar to that of an estuary enriched by human activity. This difficulty of detecting "anthropogenic stress", which Elliott and Quintino (2007) termed the "Estuarine Quality Paradox", challenges ecologists in their studies of the effects of ever-growing human populations on estuaries.

One approach is to advance our abilities to detect human-induced changes to estuaries and to predict their effects on estuarine ecosystem functioning by addressing the mechanisms that cause ecosystem response. Rather than describing changes in ecosystem properties, this approach focuses on ecosystem processes such as the cycling of nutrients in sediment and the water column, the exchange of gas and solutes between sediment and the water column, or the recruitment of sediment-inhabiting species.

In this context, our Marine Research Group of Auckland University of Technology, in collaboration with Conrad Pilditch of the University of Waikato, studies the mechanisms that link a particular perturbation, the settlement of suspended terrestrial sediment, with the response of sediment-inhabiting species. In particular, we study how terrestrial sediment deposits affect benthic recruitment—one of the ecosystem processes that controls the assemblage of sediment-inhabiting species and

Figure 1: Researcher Aysha Hohaia checks on a working section of a seawater flume that has four inserted sediment cores and a microelectrode in place to measure pH and oxygen pore water profiles. The surfaces of the first and fourth sediment cores have been treated with terrestrial clay.

Figure 2: Upper Panel – Photograph of one experimental sediment core showing juveniles of the bivalve Macomona liliana *that were dropped onto the sediment surface to observe their burying behaviour. Lower Panel – Underwater photograph of the surface of a terrestrial clay deposit showing traces of* M. liliana *juveniles.*

important functions of the sedimentary ecosystem.

Deposition of fine terrestrial sediment is, as oxygen deficiency, a natural feature of many estuaries worldwide. Coastal urbanisation, however, can increase the supply of terrestrial sediment to estuaries by orders of magnitude potentially leading to unseen

ecosystem responses. In a recent experiment with one particular sediment-inhabiting bivalve species, we investigated if and how millimetre-thick deposits of terrestrial sediment change the sediment chemistry and how such change affects the burying behaviour of this species' juveniles. We found that even millimetre-thin deposits of terrestrial sediment decreased the pore water oxygenation of the underlying estuarine sediment. We then asked if and how this decrease affects the burying behavior of juvenile recruits arriving at the surface of the deposit.

Our experiment is not the first of its kind – other studies have investigated effects of terrestrial sediment deposition. A first, however, is our detailed understanding of how deposits of terrestrial sediment modify the sediment chemistry, and the conclusion from our behavioural observations: the burial of our test individuals does not seem to be affected by our experimental perturbation. Not an unexpected result: one species' poison is another species' meat.

Reference

Elliott, M., & Quintino, V. (2007). The Estuarine Quality Paradox, Environmental Homeostasis and the difficulty of detecting anthropogenic stress in naturally stressed areas. *Marine Pollution Bulletin*, 54(6), 640–645.

Good Things Take Time – Launch of Porirua Harbour and Catchment Strategy and Action Plan

Keith Calder, Porirua Harbour Strategy Coordinator

"Good things take time" according to the familiar Mainland Cheese ad. The formal development of the recently launched *Porirua Harbour and Catchment Strategy and Action Plan* has taken four years and community and multi-agency partnerships to produce a widely endorsed plan for the recovery of Porirua Harbour.

One hundred and fifty years of progressive harbour and catchment modification since European habitation have left its mark on the largest estuary in the lower North Island. Eighty-thousand people currently live in the harbour catchment. With major projected population growth and associated development in the harbour catchment expected in coming years, the anthropogenic impacts on the environment were expected to be exacerbated if no protection and restoration plan were in place.

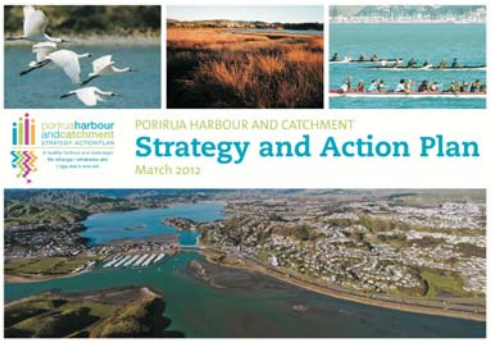
Led by Porirua City Council, Ngati Toa Rangatira, Wellington City Council (70% of the Porirua Stream catchment is in Wellington City) and Greater Wellington Regional Council have partnered with a range of other local and regional agencies to prepare the strategy which was released on 24 April 2012.

Addressing key issues

Three key issues confront the harbour: excessive sedimentation rates, excessive pollutants, and ecological degradation. The strategy objectives address each issue with measurable targets and a series of prioritised actions aimed at reversing current trends.

Reducing sedimentation rates is identified as the single most critical goal. Sedimentation is a key transporter of contaminants, reduces water clarity, smothers estuarine ecology, and reduces flushing capacities. Sediment reduction will provide the greatest co-benefits for creating a healthier harbour.

A target sedimentation rate for the estuary has been set at 1 mm/year by 2030 – significantly less than the current 5+ mm/year plus. This is the first



time a limits-based approach to resource management has been undertaken in New Zealand. Strategy partners are working with NIWA and Dr Mal Green in developing a source-to-sink model. The model will help identify and prioritise estuary locations and sub-catchments for remediation with the aim of meeting the target sedimentation rate.

Greater Wellington Regional Council with assistance from Wriggle Coastal Ltd has established an extensive monitoring programme and baseline data to gauge long-term progress towards meeting sediment, pollutant, and ecological improvements.

Keith Calder during a harbour clean up. Photo: Fairfax NZ.

Strategy stakeholders partnered early with NZ Transport Agency and the Transmission Gully Motorway team to jointly develop a harbour model that has become the basis of much of the subsequent, more detailed catchment/harbour modelling. Modelling was undertaken by consultants SKM and DHI Water & Environment.

NIWA is also currently completing an assessment for seagrass restoration for the harbour which will be a key element in ecological restoration.

Next steps

Priority activities in implementing the harbour strategy over the next 12 to 24 months will include:

- preparation and implementation of a prioritised whole-of-catchment revegetation plan and an estuary revegetation plan;
- major sewer and stormwater upgrades;
- development and implementation of a community and business education plan; and
- a review of regulatory and non-regulatory provisions governing land development within the harbour catchment.

Porirua City Council will continue funding a full-time dedicated Porirua Harbour Strategy Coordinator position to oversee strategy implementation. Most of the planned actions have funding provisions included in the current local authority long-term plans, which has been a critical timeframe target for the completion of the strategy.

Four years in the making, strategy development has had a deliberate networking, partnering, and consultation phase to ensure maximising community and agency education and engagement. This has resulted in an attractive, easily read, comprehensive and widely supported document and plan of action.

"It may not happen overnight, but it will happen!"

Pauatahanui Saltmarsh. Photo: Keith Calder.

Harbour view. Photo: Porirua City Council.

This is certainly the case with seeing any tangible results from the implementation of the new strategy. The councils, runanga, and other partners are committed for the long term. One hundred and fifty years of environmental abuse will not be undone overnight, but with an aspirational yet realistic strategy there is confidence a significant corner has been turned in the management of Porirua Harbour and catchment.

The *Porirua Harbour and Catchment Strategy and Action Plan* and its associated detailed action plan can be viewed and downloaded at www.pcc.govt.nz, keyword: harbourstrategy. Contact Keith on (04) 237 3598 or kcalder@pcc.govt.nz with any questions.

NZCS Regional Coordinators

Every region has a NZCS Regional Coordinator who is available to help you with any queries about NZCS activities or coastal issues in your local area.

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Southland	*TBC*	

Coastal News

Integrating Coastal and Marine Biodiversity into Regional Planning and Management Frameworks

Harley Spence, Team Leader, Biodiversity Department, Greater Wellington Regional Council

Editor's note: This article adapts and updates the ideas contained within what was voted the best presentation at the NZCS 2011 conference in Nelson.

At the Nelson conference I suggested that the coastal management community needs to adapt lessons learned over decades of terrestrial biodiversity management and apply these to the coastal and marine environment. Regional councils have a clear responsibility and mandate under the RMA (s30) to protect indigenous biodiversity. However, because of the disparate nature of marine management responsibilities, effective management of high-value biodiversity sites and habitats will require methods to integrate management tools from a range of agencies.

In late 2010, Greater Wellington Regional Council brought together staff from across the organisation to form a dedicated biodiversity department. This, together with council approval of a *Greater Wellington Biodiversity Strategy* in 2011, presented opportunities and challenges to better manage coastal and marine biodiversity. The biodiversity department operational plan has recently been approved by the council and new teams and work programmes have been developed to achieve the goals and actions outlined by the strategy. Throughout this process international best practice principles have been applied.

The goals of the biodiversity strategy

The purpose of the strategy is to set out a framework that will guide Greater Wellington's activities that protect and manage indigenous biodiversity in the Wellington region for the 10 years ending in 2021. Three strategic goals have been set:

- Greater Wellington Regional Council demonstrates leadership in biodiversity management;
- high-value biodiversity areas are protected; and
- regional ecosystem functions are maintained and restored.

The strategy identifies key actions with timelines and assigns responsibility for these to the relevant departments.

Existing council activities and functions impact on biodiversity

As the strategy was developed council functions and activities that impact on biodiversity were identified. This process showed that many council activities and functions affect biodiversity, but often lack any methods to assess or mitigate these impacts. In addition, within the current planning and management framework, long-term protection of sites with high biodiversity values is difficult to achieve. Whilst knowledge of terrestrial and estuarine ecosystems in the Wellington region is relatively advanced, locating information on marine ecosystems has proven very difficult.

Integrating biodiversity into future council activities and functions

Programmes from biosecurity, policy, parks, land management, and environmental education have been re-assigned to a new biodiversity department. In the new structure, teams are tasked with implementing specific biodiversity focused programmes and working with internal and external stakeholders to improve regional biodiversity outcomes. There are clear opportunities to apply internationally recognised biodiversity management techniques in both the statutory planning and non-statutory operational space. For example, Greater Wellington's regional plan is currently in the review process and this is an opportunity to incorporate lessons gained over the last decade as our planning and management frameworks are updated.

Developments since the Nelson conference

In the last few weeks Greater Wellington has received a NIWA report highlighting sites and habitats of significance in the coastal marine area (mean high water springs (MHWS) to the 12-mile limit). The report uses the same policy criteria to define "significant" sites that were used for the terrestrial environment. This consistency will be important as the regional plan development process progresses. The NIWA report, along with data collated from DOC, MPI, and others, will enable the regional plan team to replace the "blue pixel" from the previous plan and to develop rules and methods to protect these areas under the RMA.

The council has also acknowledged the need to collaborate with other agencies and stakeholders. Staff at the regional council have begun this engagement process. An initial workshop will be held and from there we plan to establish a more formal forum to address a range of issues (including biodiversity) in the Wellington coastal management area. I look forward to reporting future developments in this area.

Three dimensional habitats like kelp forests have particularly high biodiversity values. Photo: NOAA – posted to Flickr.com Creative Commons.

News from the Regions

Waikato Region

by Amy Robinson, Regional Coordinator

Whitianga Coastal Futures project

Whitianga Coastal Futures is a recently set up collaborative project between Thames Coromandel District Council and Waikato Regional Council investigating short-, medium-, and long-term solutions for the coastal erosion hazard in Whitianga. Presently the project team is completing a draft report that assesses information held from previous reports and studies that have investigated the coastal processes driving shoreline change, and considered options for management of the associated risk to assets.

The Whitianga Coastal Futures project aims to work with the community to develop and implement a strategy for managing coastal hazards at Whitianga while protecting (and where possible enhancing) economic, environmental, social, and cultural values of the local coastal environment for the whole community. The intention of the report is to provide background information and promote discussion between the councils, beachfront property owners, and the wider community.

Mangrove removal – Whangamata Harbour

Resource consent was recently granted by the Environment Court to the Rivers and Catchment Services Group of Waikato Regional Council for the removal of mature mangroves from the Whangamata Harbour. A total clearance area of 22.9 ha was approved by both hand and mechanical methods. The consents also provide for the stockpiling and burning of removed mangroves in the coastal marine area and ongoing hand clearance of seedlings from the whole harbour.

The consents have been granted using an adaptive management approach, whereby Waikato Regional Council as the consent authority has the ability to stop any further removal should the effects prove to be more than minor. Important considerations in the decision were the effects on banded rail as an at-risk species. Impacts have been mitigated by leaving landward buffer zones in known rail areas and the development of a predator control plan for the upper harbour. Mangrove removal is likely to commence later this year.

Resource consent has been given for the removal of mature mangroves from the Whangamata Harbour. Photo: Waikato Regional Council.

Bay of Plenty Region

by Reuben Fraser, Regional Coordinator

Coast Care

Every second summer Coast Care staff and contractors around the Bay of Plenty take stock of the dunes in a rapid coastal inventory. We measure things like the height and slope of the dunes, the presence of native and weedy plants, vehicle access points, signs of rabbit, and other issues affecting dune restoration. We measure more than 750 plots, each 200 m in length and the width of the dunes.

Here is a brief summary of results comparing 2008–2009 with 2010–2011. The full report will soon be available on Bay of Plenty Regional Council's website (www.boprc.govt.nz).

Spinifex coverage increased from 64 to 73 per cent on 156 km of sandy coast, and pingao increased from 13 to 17 per cent. The biggest increases of *Spinifex* coverage were seen on Otamarakau Beach, and pingao on Papamoa Beach.

Observed increases of native dune plant coverage were coupled with an overall decrease in the presence of signs of rabbit on the foredune.

An overall decrease in the impacts of vehicles on the foredune was seen across Bay of Plenty beaches,

Coast Care staff and contractors conduct a biennial rapid coastal inventory. Photo: Bay of Plenty Regional Council.

In 2010-2011 an estimated 58 per cent of Bay of Plenty coastline had some level of Coast Care group involvement. Photo: Bay of Plenty Regional Council.

with Papamoa Beach showing the greatest decline. The 2010–2011 survey showed that Whakatane District Council beaches still possessed the highest number of vehicle access points through the foredune, although the efforts of care groups at Otamarakau and Pikowai beaches have seen a significant decrease in vehicle impacts.

Coast Care group participation has increased throughout the Bay of Plenty with 58 per cent of the coastline having some level of Coast Care group involvement in 2010–2011 compared to 50 per cent in 2008–2009.

2010–2011 survey results indicate that a total foredune area of 24,144 m^2 could be planted without intervention, an overall decrease of 59 per cent from 2008–2009. This decrease may reflect Coast Care group involvement and/or erosion of the foredune, which can leave steep dune areas that do not allow for good practice revegetation techniques.

An overall increase was seen in the distance from the toe of the dune to the high-tide mark; with Waiotahi Spit showing the greatest average increase of 32 m. Whakatane District Council beaches were the only district to show a significant change in dune profile (height and slope).

Matakana Island was surveyed for the first time in 2010–2011 and showed an overall 84 per cent coverage of *Spinifex*. Overall pingao coverage was low at just three per cent. Weed species were found along the entire length of the coastline and rabbit sign was found on 68 per cent of the foredune. Vehicles were found to impact on six per cent of the coastline.

For more information on these results, or the Coast Care Bay of Plenty programme, please contact the Coast Care Coordinator on 0800 884 880.

Port of Tauranga dredging

The Environment Court has released a decision granting consent (and recommending to the Minister of Conservation to grant consent) to the dredging of shipping channels in Tauranga Harbour. The decision has been appealed to the High Court by Ngati Ruahine, one of the three iwi groups that appealed the regional council's initial decision.

Tier II Oil Spill Response Plan

The Bay of Plenty Regional Council is reviewing the *Tier II Oil Spill Contingency Plan*. The BOPRC is responsible under the Maritime Transport Act to respond to Tier II (or regional response) oil spills that occur within the coastal marine area of the Bay of Plenty. Tier II spills are spills that are beyond the resources of the persons who have caused the spill to appropriately respond to. In the Bay of Plenty a Tier II response is required as soon as oil contacts water in the coastal marine area. If the spill is beyond the capacity of the BOPRC to respond to, it becomes a Tier III (national) response and is the responsibility of Maritime New Zealand. Until recently the *Rena* response was a Tier III response.

A Tier II Oil Spill Contingency Plan was written in 2002. Its purpose was to establish a strategy and operation guidelines to enable BOPRC to respond to Tier II oil spills. The plan is outdated and is due for review. It will look at things like:

- priority areas for protection;
- response techniques;
- response organisation;
- contingency plans of adjacent regions; and
- the *Bay of Plenty Regional Coastal Environment Plan*.

Port and Harbour Safety Code – Review of Tauranga Harbour Navigational Risk Assessment

The Bay of Plenty Regional Council has engaged Marico Marine to undertake a review of the 2006 Tauranga Harbour Navigational Risk Assessment.

The purpose of the 2006 assessment was to identify key hazards associated with navigation of merchant or other vessels and smaller craft in the area bound by the Tauranga Harbour and its pilotage limits. After ranking these in order of relative risk, measures were recommended for management of heightened risk. The scope included assessment of incident and near-miss data, stakeholders' views about navigational safety, Tauranga Harbour's trade and commercial activities, weather conditions affecting the region, and organisational capability.

The purpose of the review is to assess changes of risk, as well as management effectiveness and to identify if new navigational risks are emerging. Its scope again covers the extents of Tauranga Harbour and its pilotage waters, therefore issues associated with the *Rena* grounding do not form part of this review.

Marico is already in the process of conducting various stakeholder meetings and the BOPRC is inviting views about harbour safety, which will be input into the review of the navigational safety risk assessment.

To learn more or to discuss any navigational safety issues with BOPRC, please feel free to email me at reuben.fraser@boprc.govt.nz.

Hawke's Bay Region

by Neil Daykin, Regional Coordinator

Joint resource consents for a new seawall

Resource consents to authorise the construction of a new seawall in front of an existing house in Haumoana were granted by a joint Hawke's Bay Regional Council and Hastings District Council hearing panel in March. The consents authorise the construction of an 18-m long steel sheet pile seawall, 2.5 m seaward of an existing seawall of similar design. The consents were granted for a period of 10 years, and are subject to consent conditions. Notable conditions include the requirement that the consent holder remove the wall materials in the event that the wall fails, and

that the consent holder mitigate the effects of the seawall on neighbouring properties by importing and depositing 10 m^3 of gravel in front of the neighbouring seawall each year.

Marine oil spill exercise

The Hawke's Bay Regional Council ran a marine oil spill exercise in the Napier Inner Harbour and at the Port of Napier on 22 March 2012. There were two aspects to the exercise on the day:

1. the deployment of booms and equipment in the Napier Inner Harbour to protect the marinas and estuary environments in accordance with the *Hawke's Bay Regional Council Tier II Plan*; and
2. to develop and implement an appropriate procedure to install and then deploy a new rapid deployment boom from the purpose provided container at the Port of Napier across the port entrance – this new boom will ultimately ensure a quick response in the port in the event of a real oil spill.

Local senior New Zealand Fire Service representatives also attended the exercise which provided an excellent opportunity to clarify roles in such a response. Staff worked together to draft an incident action plan using the facilities onboard NZFS's command vehicle. HBRC staff attendance was appreciated on the day as they had just come off 12-hour rotating shifts due to heavy rainfall in the preceding days.

Boom being deployed in Napier Inner Harbour. Photo: Hawke's Bay Regional Council.

Regional On-Scene Commander Bryce Lawrence said it was a really useful exercise particularly at the port and a change in the weather had given the team another opportunity to exercise options for response. A second small exercise is planned at the port to finalise procedures on the setting of the new boom.

Management Committee Members – Close-up

Ann Sheridan

Ann is a member of the Ministry for Primary Industries Aquaculture Unit, which is based primarily in Nelson. The Aquaculture Unit is the Government's principal advisor on marine and land-based aquaculture. Ann is the contact point within the Aquaculture Unit for regional councils and applicants and worked closely with regional council staff from around the country to help prepare for the implementation of the October 2011 aquaculture reforms. Her focus of work now is on assisting councils and others with coastal planning for aquaculture growth in priority regions.

Ann has a Bachelor of Resource Studies with an ecology major from Lincoln University and is currently taking the RMA Commissioner "Making Good Decisions" training. Her varied work background includes resource management advisor positions with Te Tau Ihu (top of the South) iwi, work for DOC in the Marine Protection Section, other DOC roles for Golden Bay and Canterbury, and for the Greater Wellington Regional Council. Ann is a keen sea kayaker and scuba diver. She is happy to be a new member of the management committee and serves as a Central Government Coordinator on the committee.

Harley Spence

Harley is a Team Leader in the Biodiversity Department at Greater Wellington Regional Council. Harley has been involved in the coastal management and ecological restoration fields since the early 1990s. His Master's degree in Resources and Environmental Planning assessed the intricacies of sustainable coastal management and he has been working on those challenges ever since! A consultant for over a decade, he particularly focused on design, development, and implementation of programmes that integrated policy goals, science information, and community aspirations.

Harley has been involved with the New Zealand Coastal Society since 1993. A new management committee member, he serves as Members and Partners Liaison on the committee. He is also a trustee for the Dune Restoration Trust of New Zealand. Follow Harley's thoughts and activities on Twitter – @harleyspence.

Northland Oyster Shell Project Update

Northland Regional Council update

A multi-million dollar waste recovery project that could rejuvenate the Bay of Islands' oyster industry and deliver exciting environmental and economic benefits is now well underway.

Project Oyster Shell is an innovative plan to remove and re-use timber and shells that have been accumulating on Waikare Inlet oyster farms since early 2000 when the inlet was closed due to water quality issues (which have since been resolved).

The $3.8 million project is being funded through a joint venture between the Ministry of the Environment's Waste Minimisation Fund, local and central government, oyster farmers, industry, and local iwi.

The Enterprise Northland Trust has overall responsibility for the project, which had its genesis within the Northland Regional Council 18 months ago.

Project Manager Dr Jacquie Reed says a fully operational oyster industry in the Waikare Inlet could be worth anywhere from $7m to $30m annually.

"But no oyster farming can begin to be re-established in this area unless the shells and old timber are removed."

One of the first tasks for the coming year is removing and recycling the estimated 270 m^3 of timber posts and rails on the oyster farms. Trials are currently underway to find the most effective way to remove the timber.

Good timber will go to the Department of Conservation for fencing off wetlands in Trounson Kauri Park. The remaining timber will be further tested to see if any useful waste recovery can be achieved.

The project team is also planning trials for removing the estimated 25,000 m^3 of waste oyster shell in the inlet.

"This type of venture has never been undertaken before in New Zealand, or at this scale of operation," says Jacquie.

"It's a challenge working around wind and tides, and working with machines around seawater, so we're exploring what's going to work best."

Three methods for removing the waste shells are set to be tested on five oyster farms – a barge with a mounted digger, a barge with a winch, and using a marine hand rake to remove light shell by hand.

Jacquie says that the project team is investigating new and innovative ways to re-use the waste shells which could be used in cement manufacturing, lime production, and/or other calcium-based products.

"Our aim is to make the oyster industry a zero-waste industry in Northland and in New Zealand.

"A range of companies have already expressed an interest in using the material as an alternative to quarried lime. However, there are also some spin-off opportunities for re-using shells in terms of pharmaceuticals, construction, and agriculture products."

Jacquie says two joint ventures are underway with oyster farmers and the Ministry of Science and Innovation (now MBIE).

"If this research develops a working prototype, the waste shell could be turned into a product that can then be exported across the world – it's a very exciting possibility."

Along with its economic and environmental benefits, Jacquie says the project is also bringing back a sense of pride to the local community.

"The Waikare Inlet community was really hit hard by the closure of its main industry a decade ago, but the tide is ready to turn.

"The project is helping this community re-open for business, re-establish their oyster industry, re-build relationships and create more jobs – and that's good news for everyone."

Figure 1: Trials are currently underway to find the most effective way to remove waste timber. Photo: Northland Regional Council.

Figure 2: Waikare Inlet oyster farmers trial a barge and hydraulic arm for removing waste timber. Photo: Northland Regional Council.

NZCPS 2010 – An Implementation Update

Sarah McRae, Senior Planner, Department of Conservation

The New Zealand Coastal Policy Statement 2010 came into effect on 3 December 2010. Preparation of the NZCPS is the responsibility of the Minister of Conservation. Its purpose is to state the policies in order to achieve the purpose of the Resource Management Act 1991 in relation to the coastal environment of New Zealand. Preparation of an NZCPS is a requirement of the RMA; this requirement reflects the importance of the coast to New Zealanders for its natural values and contribution to our economic, social, and cultural well-being.

The NZCPS 2010 includes seven objectives and 28 policies and provides direction on such matters as the management of activities in the coast, strategic planning, indigenous biodiversity, natural character and landscape, ports, water quality, historic heritage, aquaculture, and coastal hazards.

Steering Group

Thanks to the Local Government – Department of Conservation Implementation Steering Group for guiding us through the early stages of the current work programme. Local government members of the group include Dominic McCarthy (Auckland Council), Pere Hawes (Marlborough District Council), Linda Kirk (Environment Canterbury), Campbell Larking (Tauranga City Council) and Clare Wooding (Local Government New Zealand (Co-Chair)). DOC members on the group are Sarah McRae (Co-Chair), Anaru Luke, Rod Witte, and Kate Brooking.

The implementation work programme continues to be supported by a small secretariat based at DOC National Office in Wellington.

National Implementation Plan

The Steering Group endorsed the National Implementation Plan in 2011. This plan sets out the priority work streams and projects to support NZCPS 2010 implementation. A major outcome sought by the plan is that district and regional councils are well informed about the requirements and statutory obligations of the NZCPS 2010 and are supported to implement its policies.

Guidance

Thanks to those council planners and other practitioners who have contributed to the development of the draft guidance for each of the NZCPS 2010 policies. This package is in the final production stages and will be available online shortly. DOC and LGNZ will advise when this material is available. The guidance will provide a background to each of the policies, key points relating to implementation, and relevant resources. Application of the NZCPS 2010 in district and regional settings depends very much on the local context, and DOC is happy to engage with councils to talk about these issues. This guidance will be updated as implementation work develops.

Draft guidance for each of the NZCPS 2010 policies have been developed. Photo: Marfells Beach Recreation Reserve, PR Dingwall, DOC.

Monitoring

Work stream D of the National Implementation Plan is about monitoring the effectiveness and implementation of the NZCPS 2010. Work stream D is now scheduled to commence in July 2012 and will be led by DOC National Office. This programme of work will involve consultation with partner agencies and other stakeholders, so you may be hearing from DOC.

For further information on the NZCPS please visit www.doc.govt.nz/coastalpolicy or contact Sarah McRae at smcrae@doc.govt.nz.

Back Issues

All issues of *Coastal News* are available on the NZCS website (www.coastalsociety.co.nz). You will need to log in to access the latest issue, but back issues (from Issue Number 6, April 1996) are freely available.

National Aquaculture Strategy

The Government has recently adopted the *National Aquaculture Strategy and Five-year Action Plan*. The strategy and action plan establishes a whole-of-government pathway to enable the aquaculture sector to grow.

Through the strategy and action plan the government defines the support it will provide to the aquaculture industry in achieving its goals while acting in the public interest to ensure an appropriate balance of economic, social, cultural and ecological values.

www.aquaculture.govt.nz

Coastal News

New Zealand Coastal Society Corporate Members

Corporate membership enables organisations and companies to become part of the New Zealand Coastal Society and support the society's mission of taking a leading role in facilitating a vibrant, healthy and sustainable coastal and ocean environment.

Organisations and companies can show their support for the aims and activities of the society and achieve public recognition of that support.

Corporate membership benefits include:

- High-profile listing as a corporate member sponsor on the NZCS website (www.coastalsociety.org.nz/Corporate.htm).
- Website listing of services provided by corporate organisation, contact details, and links to recent projects or corporate member website.
- One free individual membership for the person nominated as the corporate contact or any subsequent replacement alternate.
- Five complimentary copies of *Coastal News* published three times per year.
- Discounted registration at member rates for the corporate contact to all NZCS conferences.
- Short feature on a corporate member in the *Coastal News* newsletter.

For more information on corporate memberships please contact:

Harley Spence
Membership Coordinator
Coastal Society Committee
harley.spence@gw.govt.nz

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

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