Issue 44 • June 2010

CONTENTS

www.coastalsociety.org.nz

ISSN 1172-6938

Coastal News

Te Hunga Takutai o Aotearoa

Hall Arm, Doubtful Sound. Courtesy Cawthron Institute.

Physical and Biological Monitoring in Doubtful Sound

"The land and climate are important in understanding the marine life beneath the dark waters of the fiords; in few other places do they mesh together so intricately to produce such unique environmental conditions that here support one of the richest and most unusual marine ecosystems in the world."

Ken Grange, NIWA

It was Captain Cook who gave Doubtful Sound its ominous name. While he thought the *Endeavour* could enter the fiord, he was doubtful that the winds would allow the vessel out again. He named it Doubtful Harbour (the 'doubtful' stuck but it was later renamed Doubtful Sound). As Charles John Lyttelton said about the area nearly 200 years later, "an awesome place, with its granite precipices, its hanging valley, its earthquake faults and its thundering cascades".

It is indeed an awesome place that sits within Fiordland National Park and the Te Waipounamu World Heritage site. A number of rare plants and animals live on the land, and the fiord itself boasts one of the southernmost populations of bottlenose dolphins and one of the largest known populations of black coral. The southern fiords, including Doubtful Sound, are also home to the largest populations in the world of at least five brachiopod species – known as lamp shells. Considered living fossils, biologist and Doubtful Sound expert Ken Grange says, "Brachiopods are the underwater equivalent of Fiordland's best known land-dwelling representative of a former age, the takahe, and they deserve the same study."

Doubtful Sound has two very distinct layers of water. The top layer is a low-salinity layer (LSL), in part, because it is fed by copious amounts of rainfall (nearly 7000 mm per year), as well as the spring-summer melt. On its way to the fiord, the fresh water picks up and carries plant matter (tannins) that turns the top layer of the water brown. The seawater lying underneath this LSL receives very little light due to the tannin-stained waters above it. For this reason, species that are associated with deeper waters in other places – like black coral – grow in the relatively shallow depths of Doubtful Sound.

For 40 years, the fiord has had an additional source of fresh water via discharged water from Lake Manapouri into Deep Cove from the Manapouri Hydroelectric Power Station. The station is owned by Meridian Energy Limited. Between 1973 and 2002 with only one tailrace tunnel in place the station was able to safely discharge lake water into Doubtful Sound's Deep Cove at a maximum rate of 475 to 485 m^3s^{-1}. In 2002, a second tailrace tunnel became operational and the station now discharges water at a set maximum discharge rate of 485 m^3s^{-1}. The second tailrace has allowed water to flow more freely which makes the station more efficient and also generates more energy – a 10% to 20% increase.

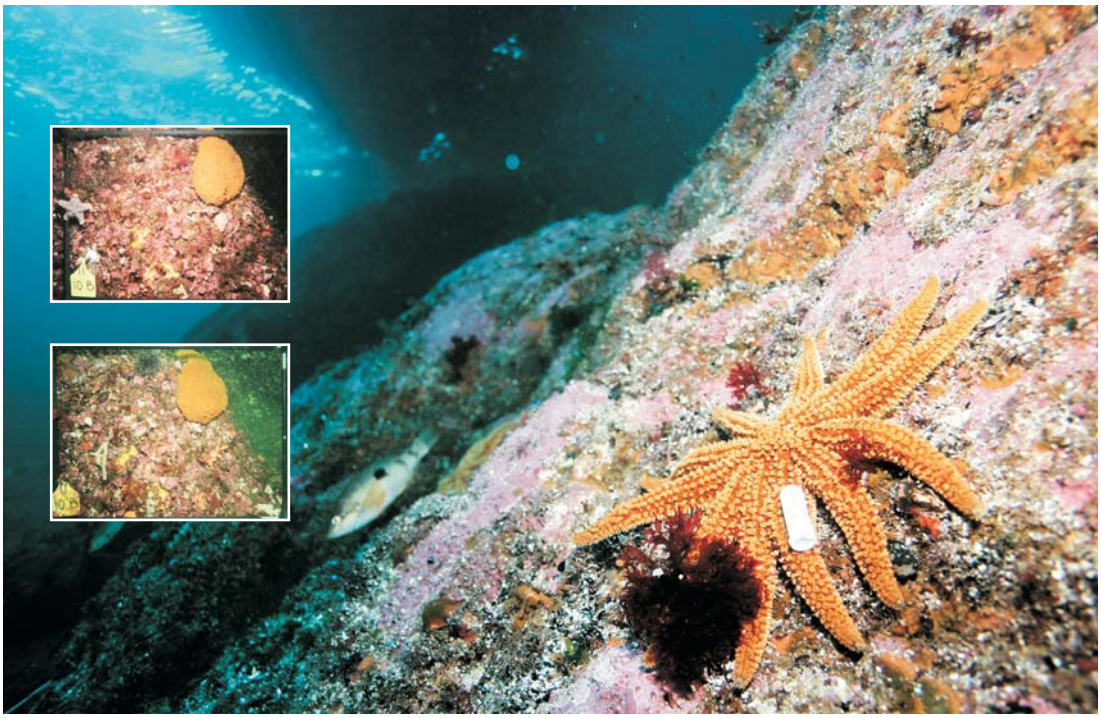
Biological and physical monitoring of Doubtful Sound has been an important part of the power station's history. "With perhaps the exception of places like Goat Island Marine Reserve, Doubtful Sound is probably the most monitored marine

Doubtful Sound from above, showing the tailrace discharge channel, and the Lyvia River (left of the channel) entering Deep Cove. Inset: Divers conduct surveys and collect photo-quadrats. Courtesy Cawthron Institute.

environment in New Zealand," says Cawthron scientist Chris Cornelisen who is lead on the ongoing monitoring of the near-surface oceanography and rock wall communities in the fiord.

Monitoring has been in place since 1997, and Cawthron together with NIWA and the University of Otago have refined and developed the programme over the years. In an effort to reduce variability associated with field sampling and data analyses, the programme was further improved in 2006 by incorporating a number of techniques aimed at maximising consistency and data quality.

"Doubtful Sound is one of the most biologically diverse of all the fiords in Fiordland. On a single square metre of the rock wall you may find 30 species ranging from sponges to sea squirts to corals to brachiopods. Because the power station has been in operation for so long and because of the complexity of the fiord's ecosystem – we know that wind drives the depth that the LSL penetrates



Predatory sea stars, such as this one that has been tagged as part of MSc student Tracey Channon's research, play an important role in structuring Fiordland's benthic communities. Inset: Annual collection of permanently tagged photo-quadrats enable evaluation of changes in rock wall communities over time. These were taken in 2006 and in 2009. Courtesy Cawthron Institute.

for example – it's a challenge to isolate impacts of ongoing fresh water discharge from the tailrace. To address that issue we've developed a monitoring programme that focuses on indicators of environmental change and which is aligned with a strong understanding of the physical effects of tailrace discharge."

With full backing from Meridian, Chris and his team have devised a programme to measure things accurately and consistently over time. This weight-of-evidence approach includes a suite of physical and biological indicators measured at permanently established sites and using the latest photographic and Geographic Information System tools.

The programme includes eight physical moorings to track salinity and temperature in Doubtful Sound and one mooring in Milford Sound to use as a comparison. Other elements of the programme include photographic monitoring of about 300 permanently marked intertidal and subtidal photo-quadrats and permanent transects that are revisited each year for tracking abundance and distribution of black corals and many other indicator species.

"We know that black corals are impacted by the depth of the LSL so they're an important indicator species to monitor," Chris says, adding that fiord-wide mapping of intertidal organisms exposed to the LSL equally contributes to an effective monitoring programme.

Scientists and technicians from NIWA and the University of Otago are also involved in the monitoring programme. Many of the scientists, like Chris who did post doctoral research on the fiord, have been monitoring Doubtful Sound for years. "Having a team of scientists and researchers onboard who know the site well is absolutely critical to the monitoring programme's success," Chris says.

He adds that the monitoring work is important to making informed management decisions for the area and has fed into academic research. "If we're to safeguard the Doubtful Sound ecosystem we need to fully understand it. The monitoring programme is an essential part of that understanding."

Meridian is currently seeking resource consents to increase the operational limit of tailrace discharge into Deep Cove to 550 m^3s^{-1}. The results from the monitoring programme, along with additional field data, results from two high-flow trials, and hydrodynamic modelling has been used to assess the impact of this water discharge increase on the Doubtful Sound environment. Such information is also critical in establishing baseline conditions.

Deep Cove, Doubtful Sound. Courtesy Cawthron Institute.

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 incorporates over 300 members.

Members include representatives from a wide range of coastal science, engineering and planning disciplines, and are employed in the engineering industry, local, regional and central government, research centres and universities.

Applications for membership should be sent to NZCS Administrator Hannah Hopkins (email: hannah.hopkins@ew.govt.nz).

Coastal News

Multi-Purpose Reefs at Orewa Beach, North Auckland

A current coastal protection initiative is gaining momentum to establish a pod of multi-purpose reefs at a popular north Auckland beach. The Orewa Beach Reef Charitable Trust (OBRCT) has the support of Rodney District Council (RDC). The proposal is to construct a pod of submerged multi-purpose reefs out from the low tide mark at Orewa Beach to address coastal erosion and retain sand on the beach in the long term.

Once the proposal has been approved, the first set of three submerged structures will be placed at increasing distances offshore of the section of beach listed as Priority Zone 1 in RDC's Orewa Beach Esplanade Enhancement Project (OBEEP). OBEEP seeks to 'beautify' the foreshore by creating a continuous walkway along the beach's length underpinned by a wall and dune planting. The dynamic nature of the coastal environment means that it is necessary to protect these works with a build up of salient/sand on the beach, of which the reef project is the main component. The two projects are part of a holistic and integrated approach to beach management.

The proposed solution is borne from a community-based project with a vision to establish multi-purpose offshore submerged reefs to reclaim dry high tide beach, establish dunes and reef habitat, and provide enhanced amenity value for water/wave sports.

It is envisaged that enhancing the amenity and environmental value of Orewa Beach will also have positive impacts on the social, educational and economic sectors of the region; enhancing local environmental, social and economic sustainability.

OBRCT proposes a 'staged roll out' and is insisting on intensive monitoring at each stage to ensure the best possible outcome of the project.

History

The long sandy beach is considered the major attraction of Orewa and the most significant natural asset in the area. However, since early last century a number of contributing factors have dramatically reduced the width of 'dry' beach along much of its length. Sand mining, loss of natural sand dunes (human encroachment), construction of tipped rock walls and the blasting of the river mouth in 1959 have all contributed to the current poor health of Orewa Beach. In recent years sand has been replaced on the beach to increase the dry beach area and protect the back beach from the further erosion that can occur during storm events, but the nourished material does not stay in place in the long term.

The Solution

The OBRCT commissioned the New Zealand company Amalgamates Solutions Research (ASR) Ltd, a global leader in the design and construction of multi-purpose reefs, to produce a design solution to meet all the criteria laid down by the OBRCT and the RDC.

ASR undertook extensive field work, data collection and numerical modelling to determine the best location and plan shape for the reefs. The design was then transferred to their custom-built laboratory where physical model testing further refined the shape and dimensions into a form (reef) that could be constructed using sand-filled mega containers and positioned in a GPS directed position on the seafloor some 100 to 300 m offshore.

OBRCT and RDC are also working with URS, an environmental and engineering consultancy on the specifics around the landscaping requirements component in the Assessment of Environmental Effects (AEE). That work is being coordinated by planning company Resource Management Solutions (RMS Ltd), who are also compiling the documentation, including the application, towards a consent hearing. The AEE outlines the effects the reef proposal will have on the surrounding area and/or environment and stems from a requirement of the Resource Management Act. It is detailed and includes everything from ecological impact to the visual impact of what it would look like to have sand build up on the beach.

OBRCT are working closely with the local iwi to ensure that their concerns and desires are met. Ngati Whatua has taken a lead role in the area in matters of seabed and foreshore and their input is valued. OBRCT believes its desire for

Figure 1: Geotextile bag construction for a multi-purpose reef. Courtesy ASR Ltd.

Figure 2: Multi-purpose reef construction. Courtesy ASR Ltd.

intergenerational sustainable coastal management is akin to local iwi's philosophy.

Placement of submerged reefs will establish a new control point that will allow the beach plan shape to maintain a new equilibrium, namely a widening of the beach. This widening will sustain a beach and dune system while protecting public and private property.

This type of solution has a variety of other positive benefits other than providing the sandy beach amenity. This includes working with the RDC's OBEEP and better enabling the success and protection of land-based amenity. Having sand retention structures offshore rather than on the beach means no negative impacts on access or aesthetics, providing substrate for marine organisms to inhabit, resulting in both increased local biodiversity and a snorkelling/diving attraction during calm weather, and providing surfing opportunities when the conditions are right.

What is a Multi-Purpose Reef?

A multi-purpose reef is a type of coastal structure that can reduce erosion, enhance marine habitat and provide a valuable recreational resource. The concepts behind multi-purpose reef designs are based on the observed and measured response of a shoreline to naturally occurring offshore reefs, as well as to man-made structures positioned offshore.

The key to the effectiveness of a multi-purpose reef is the formation of a salient – a wider, more stable section of a beach caused by the reef. This effect is a phenomenon that has been well documented and quantified in peer-reviewed technical journals and coastal engineering manuals. ASR has merged these concepts with their understanding of marine systems and their pioneering work on the science of surfing to develop technology which will protect and stabilise the coastline, enhance marine ecology, and, where the natural conditions will allow, create an enhanced surfing sports experience.

Figure 3: Physical modelling of waves in the ASR laboratory. Courtesy ASR Ltd.

Figure 4: Feasibility study showing a desired beach response to a reef placed just north of the surf club. Courtesy OBRCT.

The result of all this research and development is ASR's multi-purpose reef. When compared to traditional solutions like seawalls, multi-purpose reefs have five distinct benefits:

1. Reefs reduce and redirect the wave energy affecting the coast thereby reducing the erosion stress and stabilising the shoreline.
2. Reefs provide a solid substrate which creates additional habitat for marine animals and promotes biodiversity and enhanced ecosystems.
3. Reefs create a recreational amenity for surfing, diving, and fishing.
4. Reefs are submerged and located offshore and therefore do not degrade the natural beauty of the beach (no ugly concrete walls).
5. Multi-purpose reefs actually consider the value that beaches provide to local communities by serving to protect the beach itself. Seawalls and other forms of coastal armouring don't actually protect the beach; they only protect the land behind it. Beaches are very valuable assets to coastal communities that create a myriad of benefits both from a socio-economic and coastal protection standpoint.

Zane Taylor
Orewa Beach Reef Charitable Trust
info@orewabeachreef.org

Figure 5: Orewa Beach erosion. Courtesy OBRCT.

Figure 6: Artificial reef marine life. Courtesy ASR Ltd.

Coastal News

Mangrove Removal at Pahurehure Inlet 2, Papakura

The Papakura Inlet Protection Society (PIPS) has been working since 1995 on a plan to control the spread of mangroves in their estuary, Pahurehure Inlet 2. The inlet was choked off from the Manukau Harbour by construction of the Southern Motorway in 1964.

Pahurehure Inlet 2 is typical of many northern North Island estuaries where natural flushing has been dramatically reduced by causeway construction. Historical Pahurehure Inlet 2 photographs show a sandy shoreline along what was an upper arm of the Manukau Harbour. Construction of the Southern Motorway replaced the ~500 metre-wide entrance to Pahurehure Inlet 2 with a 12 m^2 cross-sectional flow area concrete culvert. This catastrophic reduction in flow area resulted in the estuary becoming a sink for fine sediment. Forty-six years later, approximately one metre of mud has buried the environment that long-term locals once knew. What had been a mangrove free estuary soon became ideal mangrove habitat. By 1995, locals realised that if nothing was done to control the spread of this species, the entire Pahurehure Inlet 2 would become a forest of mangroves similar to Pahurehure Inlet 1 which has become just that after also being choked off by the Southern Motorway construction.

Following years of effort which included creation of the Pahurehure Inlet Management Plan in November 2006, the Papakura District Council applied for a resource consent in 2008 prepared by Lawrence, Cross and Chapman (planners), Brian T. Coffey and Associates Limited (environmental consultants) and LaBonté Coastal Consultants Limited (LCCL) to mechanically remove 27.6 ha of mature mangroves from Pahurehure Inlet 2. The consent attracted close to 1500 submissions with all but six in support of the proposed removal. The hearing committee approved the consent with conditions that required considerable environmental monitoring. This project is the first large-scale legal removal of mangroves in the Auckland region.

Pylon Point mangrove removal.
Courtesy Gwenda and Graham Purdy.

Pylon Point mangrove removal.
Courtesy Gwenda and Graham Purdy.

Pre-removal baseline monitoring began in November 2009. LCCL installed a total of 38 elevation pins (25 mm galvanised pipes 1 to 1.5 m in length) at seven monitoring sites (four control sites (C1-C4) and three mangrove removal sites (T1-T3)) to monitor possible changes in sediment elevation and distribution during the life of the project. At each of the elevation pin sites triplicate sediment penetration measurements were taken to document possible changes in sediment density. In addition, triplicate sediment samples for grain size analysis were taken at all offshore elevation pin sites in order to document possible changes in grain size. Brian Coffey and Associates Limited also began baseline monitoring of water quality and benthic community structure. Water quality parameters measured included turbidity, dissolved oxygen, five-day carbonaceous biological oxygen demand, water temperature and conductivity at all seven monitoring sites. The pre-clearance benthic community survey involved the collection, sorting, identification and counting of macroscopic taxa in 126 core samples taken from the seven monitoring sites.

In December 2009, LCCL installed an In-Situ Inc. Troll-9500 XP data logger in the scour basin at Pahurehure Inlet 2. The instrument is continually submerged and records turbidity, dissolved oxygen and temperature data at 15-minute intervals. The data is downloaded and the instrument is cleaned every two weeks. Prior to mangrove removal activity, three months of baseline data was collected by the Troll-9500. The instrument was reinstalled one week prior to initiation of mangrove removal activity.

In order to protect fringing rush marsh adjacent to mangrove removal areas, turbidity skirts were installed on the seaward side of the rush marsh in advance of removal activity. Franklin Tree Services began removal on 14 April 2010 and it is anticipated that removal of all mature mangroves from the three one-hectare trial plots will be completed by mid-May 2010.

One of the resource consent conditions requires that all cut vegetation (~130 tonnes per ha/250 m^3 chips per ha) be removed from Pahurehure Inlet 2. Several removal methods were evaluated but the use of tracked or wheeled machines in the gloopy mud of Pahurehure Inlet 2 caused these options to be either impractical or uneconomic. Accordingly, removal of cut and bundled vegetation by helicopter was determined to be the most efficient and economical method causing the least disturbance to the sediment. It has also been very entertaining for the community. To view the helicopter in action, visit www.pipspapakura.org.nz. As can been seen in the video, cut mangroves were stropped into bundles weighing approximately 400 kg, and delivered to the chipping equipment with a turnaround time of 80 to 100 seconds.

Pre-clearance baseline and post-clearance data are being analysed and compared in order to evaluate effects associated with clearance activity. The outcome of this evaluation will determine whether or not future removal activity methods require spatial or temporal modification in accord with the adaptive management process being applied to this project.

André LaBonté
labonte@xtra.co.nz

NZCS Management Committee

Chairperson:	David Phizacklea	david.phizacklea@envbop.govt.nz
Deputy Chairperson:	Deirdre Hart	deirdre.hart@canterbury.ac.nz
Secretary/Treasurer:	Eric Verstappen	eric.verstappen@tdc.govt.nz
Membership Coordinator:	Kath Coombes	kath.coombes@arc.govt.nz
Regional Coordinator:	Rick Liefting	rliefting@tonkin.co.nz
University Coordinator:	Karin Bryan	k.bryan@waikato.ac.nz
Coastal News Coordinator:	Cushla Loomb	cushla.loomb@beca.com
Website Coordinator:	Deirdre Hart	deirdre.hart@canterbury.ac.nz
Conference Coordinator:	Jenni Paul	jenni.paul@ew.govt.nz
Email Digest Coordinator:	Andrew Swales	a.swales@niwa.co.nz
Administrator:	Hannah Hopkins	hannah.hopkins@ew.govt.nz

For any enquiries regarding *Coastal News* articles, please contact NZCS Editor **Shelly Biswell (shelly@biswell.net)**.

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.

North Island

Northland	Ben Lee André Labonté	benl@nrc.govt.nz labonte@xtra.co.nz
Auckland	Hugh Leersnyder Alastair Senior	hugh.leersnyder@beca.com asenior@tonkin.co.nz
Waikato	Amy Robinson	amy.robinson@ew.govt.nz
Bay of Plenty	Reuben Fraser	Reuben.Fraser@envbop.govt.nz
Hawke's Bay	Neil Daykin	Daykin@hbrc.govt.nz
Taranaki	Erin Zydervelt	erin.zydervelt@trc.govt.nz
Wellington	Iain Dawe	iain.dawe@gw.govt.nz

South Island

Upper South Island	Eric Verstappen	eric.verstappen@tdc.govt.nz
Canterbury	Justin Cope	justin.cope@ecan.govt.nz
Otago	Mike Hilton	mjh@geography.otago.ac.nz
Southland	Ken Murray	kmurray@doc.govt.nz

Coastal News

Making a Coastal Statement

The Board of Inquiry report to the government regarding the New Zealand Coastal Policy Statement (NZCPS) was released to news media and environmental groups in mid-May by one of its authors.

The board member, Philip Woollaston, who is a former Minister of Conservation, Mayor of Nelson, and Policy Advisor to the United Nations Environment Programme, said that to date the government has refused Official Information Act requests to release the report.

"This document is public property," Mr Woollaston said at the time of the report's release. "It is the result of a large number of public submissions, considered in a statutory process over many months and at public expense. The public has a right to know the result, not least those who took the time and trouble to write submissions and appear at hearings up and down the country."

The report was completed nearly a year ago, but Conservation Minister Kate Wilkinson has yet to release its findings. In a written statement to Radio New Zealand, the minister said she has no intention of rushing decisions on what is a complex issue.

The current NZCPS dates back to 1994 and is generally seen as being out of date and in need of revision. As part of the process in developing the report, the board considered 539 written submissions. It also heard 175 submitters, Department of Conservation staff, and a number of expert witnesses during public hearings that were held around the country between 26 August 2008 and 17 December 2008.

The report is in two volumes. Volume 1 contains the board's findings and recommendations on the proposed NZCPS including a 'recommended NZCPS (2009)'. Volume 2 contains the background information that informed and contributed to the decision-making of the board (note that Mr Woollaston did not release Volume 2).

The report deals with a wide range of coastal issues including subdivision and development, protection of outstanding natural and historic features, biodiversity, public access and vehicles on beaches, and coastal hazards.

Upon the report's release EDS Senior Policy Analyst Raewyn Peart said "The high level of public engagement in the process reflects the passion New Zealanders have for the coast and widespread concern that we need to lift our game when it comes to managing development pressures.

"On the whole, the Board of Inquiry's proposals are positive. They provide much clearer national direction on how we can achieve good environmental outcomes while still enabling development on the coast."

To download the Board of Inquiry's report visit www.eds.org.nz.

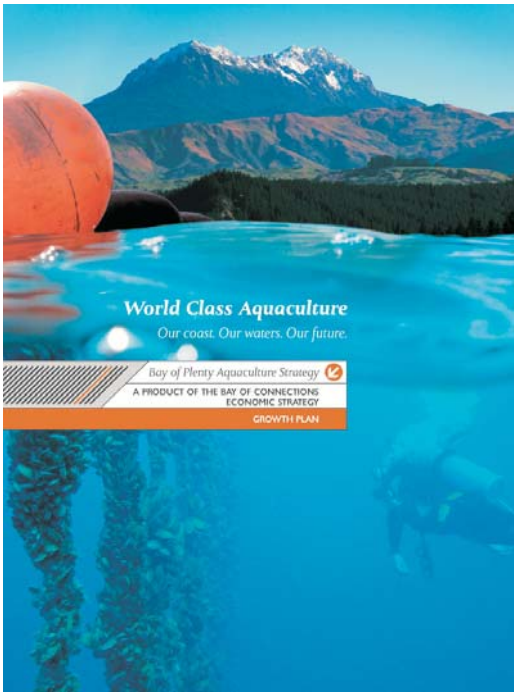
Bay of Plenty: Building a World-Class Aquaculture Region

The Bay of Plenty Aquaculture Strategy is a product of the Bay of Connections Economic Strategy. Published late in 2009, the ambitious strategy is the first of its kind in New Zealand. The strategy sets out the steps necessary to grow an integrated and sustainable aquaculture industry in the Bay of Plenty.

"Aquaculture presents an opportunity to substantially contribute to the economy of the Bay of Plenty," says Cheryl MacGregor, Senior Advisor Regional Development, Environment Bay of Plenty. "It's an opportunity that many of our stakeholders recognise and actively foster."

The strategy states that 3145 full-time equivalent positions could be created in the region by 2025 with an estimated gross domestic product (GDP) of around $228 million. Estimates place the value of work carried out to date to support aquaculture development in the Bay of Plenty at $6 million. The work has included:

- Eastern Sea Farms Limited, the holders of the consent for the 3800-ha space off Opotiki, prepared the original application and have carried out research and testing on the site.
- Environment Bay of Plenty has undertaken initial scientific work, processed applications, and held regional forums to progress aquaculture development.
- Opotiki District Council has supported aquaculture research and studies on developing a harbour entrance necessary to service a large marine farm.
- Whakatohea Maori Trust Board has initiated research and development of the most suitable species for the area.



Opotiki Harbour Development Project Commended

In the Bay of Plenty Aquaculture Strategy, Opotiki is identified as central to the Bay of Plenty's aquaculture development. One of the requirements to ensure aquaculture in Opotiki, however, is the development of a harbour entrance that will provide safe access for vessels under most tide and weather conditions. The harbour development project has secured resource consents.

Opotiki District Council, supported by a technical advisory group, is now investigating sources of support and funding for the project. As an acknowledgement of the hard work that has already gone into the Opotiki Harbour Development project, the Opotiki District Council was recently short-listed for the Te Puni Kokiri Award for Crown – Maori Relationships in the annual Institute of Public Administration New Zealand (IPANZ) Gen-i Public Sector Excellence Awards. The winner of the award will be announced at a special event on 18 June 2010.

- Bay of Plenty Polytechnic has provided equipment, teaching and research resources related to aquaculture.
- Central government has funded investigations into the potential of offshore aquaculture in the region.
- Te Runanga o Ngati Whakaue ki Maketu has supported research on inshore marine farming possibilities and most suitable species for the Maketu area.

In mid-2009 a draft of the strategy was produced and an Aquaculture Advisory Group was established. The group includes representatives from business, Maori interests, the aquaculture industry, government and science organisations.

The key to the strategy is an action plan. 2010 is a pivotal year in the action plan. Actions identified for this year include establishing a mandated regional aquaculture organisation and funding plan; species research and development; initial market development work; assessing education and training needs; and supporting an enabling regulatory regime.

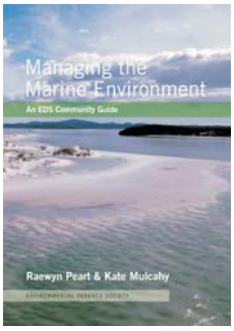
To view the Bay of Plenty Aquaculture Strategy visit www.bayofconnections.com/Regional_Strategy/sectors/aquaculture.asp.

Missed an article in Coastal News?

Back issues (from Issue 6, April 1996) are available as pdf downloads from www.coastalsociety.org.nz – follow the 'Publications' link on the front page.

News in Brief

Managing the Marine Environment



The Environmental Defence Society (EDS) recently published *Managing the Marine Environment: An EDS Community Guide*. Authored by Raewyn Peart and Kate Mulcahy, the guide has two main parts. Part one provides an overview of New Zealand's marine area and how it is currently managed. It also identifies opportunities for public involvement in seeking better environmental outcomes. Part two provides information on a range of activities which can potentially impact the marine environment. It also offers information on known best practice that can be applied to help minimise negative environmental impacts.

The guide's appendices include case studies on seabed mining and aquaculture, the New Zealand Coastal Policy Statement, and the Hauraki Gulf Marine Park Act 2000.

"The legislative framework for the marine environment is complex and generally poorly understood" says EDS Senior Policy Analyst and co-author Raewyn Peart. "EDS decided to develop the guide in order to demystify this area of resource management. We wanted to support quality decision-making which would result in improved environmental outcomes on the ground."

EDS chose to offer this guide as an e-book so that the guide can be regularly updated to reflect changes in marine law. The guide is available at www.eds.org.nz/eresources/e-books.cfm.

Aquaculture Reforms Planned

In late April Fisheries and Aquaculture Minister Phil Heatley announced that Cabinet has agreed to a number of amendments aimed at boosting the aquaculture industry's potential to generate sustainable economic growth for New Zealand.

The proposed changes include a range of measures, such as streamlining the Resource Management Act, encouraging investment by injecting certainty into the system, and a central government commitment to support industry growth and development.

Responsibility for the management of aquaculture will remain with regional councils. The reforms, however, include agreement in principle to establish a power for the Minister of Fisheries and Aquaculture to amend regional coastal plans in exceptional circumstances where it is in significant regional or national interest.

A central element of the reform package is the removal of the requirement that aquaculture activity must be located within Aquaculture Management Areas (AMAs) defined in regional coastal plans. No AMAs have been created where aquaculture didn't already exist in the last five years. The proposed changes will mean that aquaculture consents can be applied for directly without the need to first establish an AMA.

Other elements of the reform package aimed to reduce cost, delays and uncertainty include:

- extending the requirement for hearings panel members to be accredited, to support more robust consent decisions;
- integrating the Undue Adverse Effects on Fishing Test (UAE) as a step in the consent process, with, as far as possible, shared information and linked processing timelines and hearing processes;
- limiting the information for UAE decisions to that which is available at a defined date;
- allowing aquaculture applicants to register an Aquaculture Agreement with the relevant fishing quota holders before lodging an application for a UAE test, in which case a UAE assessment in respect of commercial fishing will not be undertaken for the relevant fish stocks;
- enabling private plan change applicants to benefit from their effort by allowing them to apply for resource consent over up to 80% of the aquaculture space created if their application is successful; and
- reducing the period before which an aquaculture consent will lapse if it is not used from five to three years to encourage utilisation of space and limit speculation.

What happens next?

An Aquaculture Reform Bill will be drafted. The Bill is expected to be introduced in mid-2010. There will be targeted engagement with iwi and key stakeholders to ensure the new regime can be practically implemented.

Further Cabinet papers will be developed making recommendations on the implementation of the Maori Commercial Aquaculture Settlement under the new regime, on whether and how marine farmers may be charged in relation to the management of aquaculture, and on transition to the new regime.

The government is committed to delivering the Maori Commercial Aquaculture Settlement under the new regulatory regime and will consult with iwi and relevant stakeholders on ways this can be achieved.

A Q&A on the proposed reforms is available at www.fish.govt.nz/NR/rdonlyres/AEF9A66B-1455-42AC-B49E-28E28DA4666C/o/Aquaculture_reform_QAs_27Apr10.pdf.

Source: Ministry of Fisheries media release and aquaculture reform questions and answers at www.fish.govt.nz/en-nz/Press/Govt+outlines+plans+for+aquaculture+reform.htm.

On Campus: Victoria University

Ocean Governance: An International Perspective

In March 2010 Dr Mike McGinnis joined Victoria University of Wellington's Institute of Policy Studies (IPS) as a Senior Fellow. For the next two years, Mike will be the lead investigator for an IPS project entitled 'Ocean Governance: The New Zealand Dimension', which is part of the university's Emerging Issues Programme (EIP). Coastal News recently interviewed Mike to learn more.

Mike is the former Director of the Ocean and Coastal Policy Center at the University of California at Santa Barbara (1995 to 2010). During that time he was also lead consultant and advisor to state and national resource agencies in the development of coastal marine ecosystem-based planning and watershed-based management in California, and worked extensively on the designation of marine protected areas (MPAs) for the northern Channel Islands offshore southern California. He's also been a surfer since he was seven years old (as a teenager he was ranked sixth in the US). In other words, his interest in the marine environment is both personal and professional.

"Around the world, climate change is threatening coastal environments and the cultures that depend on them," Mike says. "One of the reasons I'm here is to better understand how cultures throughout the South Pacific are grappling with climate change and take some of that knowledge back to the north.

"Local knowledge and scientific expertise is critical to find solutions to climate change and other threats to our coastal environment. As the poet and environmental activist Gary Snyder would say: 'Find your place on the planet. Dig in, and take responsibility from there.'

"It's an ethic similar to the saying I have recently learned here in reference to the Whanganui River: 'I am the river. The river is me.' [Ko au te awa. Ko te awa ko au]. One of my research projects looked at what frameworks were most successful in river basin management and ecological restoration across the west coast of the US. What we discovered in the US, is that community-led initiatives are the most successful and long-lasting. No amount of government funding or outside intervention can save a place if there isn't local support."

Mike goes back to the Latin root of the word community. "Munis means a system of shared obligation. That obligation extends not only to one another, but also to our environment. Living within a community is as much about giving back, as it is about receiving. Communities that operate that way are more likely to 'weather the storm' so to speak."

Mike is currently completing a book with the working title *Negotiating Ecology: Case studies on Politics & Ecology*. He says that interdisciplinary science

is coming of age. "In California, in the past 20 years science has become an integrated part of the policy-making process."

A recent example of how science – and scientists – can play a critical role in policy-making is the 2009 vote of the Santa Barbara County Board of Supervisors to support the long-term development of a Climate Action Strategy that would include or consider biodiversity concerns. Mike served as a principal in developing the cutting-edge strategy which is based on scientific research and sets out biodiversity protection measures and policies to address the expected impacts from climate change on coastal marine ecosystems.

It's an approach Mike believes needs to gain more traction. In a paper published in 2009 for a European Union collaborative project, 'Managing biosafety and biodiversity in a global world', Mike looks at the importance of coastal marine ecosystem-based regulatory policy in the US and Euro-Mediterranean in addressing biodiversity loss in a changing climate. He includes a description of ways to improve transatlantic learning and coordination to protect coastal marine biodiversity in the US and the Euro-Mediterranean and in his conclusions states: "Ultimately, new social alliances and partnerships that combine scientists, policy-makers and non-governmental organisations that cut across Mediterranean-type ecosystems are needed to address coastal marine biodiversity loss in an age of climate change."

Near the end of our interview Mike shared an experience he had right before accepting the position at IPS. While surfing in Hawaii he was overtaken by a large wave and thought for a moment he was a goner. He looked over and saw that a large sea turtle (honu) was in the wave with him.

"Honu signifies 'death' or 'transformation' in indigenous Polynesian culture. Honu travels hundreds, sometimes thousands of kilometres, but time and again returns home. When later that day I got the call offering me the position with IPS I knew my answer. I'm here to learn. I'm here to share my perspective as an outsider and to learn from others about coastal and marine ecosystems and cultures."

To learn more about Mike and his research visit http://ips.ac.nz/staff/team/Michael%20McGinnis.html.

Coastal News

Scientists probe the depths of Taputeranga Marine Reserve

Department of Conservation and Victoria University's Centre for Marine and Environmental and Economic Research (CMEER) scientists have a better understanding of what lies beneath the waters of Wellington's Taputeranga Marine Reserve after undertaking an underwater survey during summer.

Department of Conservation divers collaborated with CMEER scientists to sample the biological diversity of the 854-ha reserve, established in 2008.

While it is too soon to observe any significant changes, the data collected by the divers will be used to measure future changes.

"We would typically expect to see a measureable increase in species abundance after about three to five years," DOC Biodiversity Programme Manager Brent Tandy said. "The data collected this summer, along with that gathered by CMEER in the 10 years prior to the reserve's establishment, will be analysed and compared with future results, enabling us to determine how well the reserve is working."

While the divers did not encounter as many animals as they would expect to find in an established reserve, they saw some impressive specimens, including some large blue cod and paua, DOC Marine Scientific Officer Debbie Freeman said.

"We were fortunate enough to carry out the monitoring when the water was very clear on the south coast, so we had underwater visibility of up to 20 m at some sites. That and the diversity of marine life made the monitoring work enjoyable and absolutely fascinating."

Debbie said the dive team enjoyed the opportunity to compare a new reserve with older reserves, such as the 13-year-old Te Angiangi reserve in the Hawke's Bay, which was also monitored recently.

"We've all been involved in monitoring much older New Zealand marine reserves, and it's great to be able to see the state of marine life in a newly established reserve. It's exciting to think about how life in the Taputeranga Marine Reserve will look in 20 or 30 years time."

Local school children lent a helping hand with the monitoring, as part of the Experiencing Marine Reserves (EMR) Programme. EMR is a hands-on programme where students snorkel in unprotected sites and marine reserves and compare their observations.

Students from Houghton Valley and Island Bay schools undertook subtidal monitoring, which involved counting fish along 25-metre sampling lines and recording the data.

Over time the students will process the data and observe changes within the reserve. Their methodology interlocks with the deeper water research being carried out by DOC and CMEER. It is hoped that by involving the students in the monitoring a long-term connection will form between the schools and their local marine reserve.

Results from the baseline biological monitoring will be available once all the data has been analysed, later in the year.

Department of Conservation and Victoria University's Centre for Marine and Environmental and Economic Research

Profile: Andrew Swales

NZCS management committee member Andrew Swales is a scientist and manager of NIWA's Coastal and Estuarine Processes Group in Hamilton. After completing an MSc Hons degree at the University of Auckland in 1989, Andrew has spent most of his career researching estuarine sediment processes in tidal creek, intertidal flat and vegetated habitats. His research over the last several years has focused on better understanding the feedbacks between physical processes and mangrove ecology, and the drivers of mangrove habitat expansion in North Island estuaries. This work has involved close collaboration with scientists from the United States, Canada, Australia and regional councils. Andrew was the lead in the development of NIWA's estuarine monitoring toolkit (Nga Waihotanga Iho) with Environment Waikato, along with Coromandel and west coast hapu.

In a previous life, Andrew worked for several years at the Auckland Regional Council and resource management agencies in the United Kingdom. Outside the office he enjoys the great outdoors (mountain biking, diving, fishing) and trying to keep up with his pre-teen children.

Andrew joined the NZCS management committee in 2008 and serves as the email digest coordinator.

Contributing to Coastal News

Coastal News welcomes contributions for each issue. Please contact Shelly Biswell at shelly@biswell.net if you'd like to submit a news brief or article.

The submission deadline for the next issue of *Coastal News* is 1 September 2010.

News from the Regions

Auckland Regional News

Hugh Leersnyder, Auckland Regional Coordinator

Hauraki Gulf Marine Park Act – Ten Years On

The Hauraki Gulf Marine Park Act celebrated its tenth anniversary this year. To mark this milestone and a decade of achievements, and to raise awareness of Auckland's remarkable marine park, the Auckland Regional Council and Auckland Museum hosted a special symposium, 'New Perspectives on the Gulf'. The symposium brought together a wide range of speakers to offer their perspectives on the values, pressures and future directions for the management of the Hauraki Gulf.

The Hauraki Gulf Marine Park Act covers the eastern coasts of the Auckland and Waikato regions and the catchments draining to this coast. The Act is in three parts: encouraging the integrated management of the gulf and elevating its status as a special area; creating the Hauraki Gulf Forum; and establishing the park itself.

Mike Lee, Deputy Chairman of the forum and Chair of the Auckland Regional Council, gave a brief history of the establishment of the Hauraki Gulf Marine Park. Reflecting on the past ten years he described a number of successes but was critical of "the tardiness that local government has exhibited in complying with its obligations under the Hauraki Gulf Marine Park Act". Mike asserted that "it is time that local government and the legal establishment woke up to the fact that the [Act] was passed into law to recognise and proactively protect and enhance the special nature of the Hauraki Gulf".

Mike took symposium attendees on an imaginary voyage around the Hauraki Gulf, visiting many islands and mainland sites, describing their natural features and beauty, and discussing the efforts being undertaken by many organisations and volunteers to protect and enhance these special places.

The area of the Hauraki Gulf is under considerable pressure. Both urban and rural land uses are adding to increased consumption and contamination of fresh water draining into the gulf. There are also increased numbers of commercial and recreational vessels in the gulf's waters, and an increase in demand for coastal space for marine farms, marinas and moorings.

Presenters at the symposium covered a range of topics including a description of the pressures from rural and urban land use, and the presence and pressures on marine mammals, fish, benthic invertebrates and seabirds that are found within the gulf.

The final two presenters described the value and role of non-regulatory tools to assist in the management of the gulf and the challenges facing the new Auckland Council in giving effect to the provisions of the Hauraki Gulf Marine Park Act.

Copies of the symposium's presentations are on the ARC's website, www.arc.govt.nz.

Waikato Regional News

Amy Robinson, Waikato Regional Coordinator

2010 NZCS Conference

The conference organising committee is in full swing planning the next NZCS conference to be held in Whitianga 17 to 19 November 2010. The conference precedes the annual Whitianga Dive Festival (see www.divefestival.co.nz).

The call for abstracts has gone out. The deadline for oral and poster presentation abstract submissions is 15 June 2010. Abstracts are invited on all aspects of coasts, especially for the themed sessions. Please forward submissions to Amy Robinson (amy.robinson@ew.govt.nz) by the required date.

Check out the 'Events' page of the NZCS website for further details on the conference.

INTERCOAST Presentation

The NZCS, in conjunction with the joint INTERCOAST collaboration between the Universities of Waikato and Bremen, hosted a talk by Professor Dr Dierk Hebbeln on 15 February. Dierk's talk was entitled 'Some like it cold – coral belt from Norway to Africa', which was based on his research on cold water corals.

Dierk is a paleoceanographer who, amongst other things, researches climate change signatures in sediment cores from the North Atlantic. His talk outlined that in the Irish Sea, bathymetric surveys have identified coral mounds in waters 600 to 1200 m deep with diameters of one to five kilometres and up to 300 m high. Corals are filter feeders that catch falling food particles and have very slow growth rates. Where tropical corals enjoy a water temperature of 20°C to 29°C, their cold water cousins tend to inhabit the benthos below the photic zone in temperatures ranging 4°C to 13°C.

Chilean Tsunami

The 8.8 magnitude, 35 km deep earthquake that centred near Concepción, Chile on 27 February 2010 resulted in a tsunami alert along the eastern coast of the Waikato region. The signal showed a maximum wave height of 1.25 m in Whitianga Harbour.

Seaweek in the Waikato

Thousands of people took part in Seaweek events held in the Waikato region with evening lectures, beach clean-ups, and community days running across the region from Whitianga on the east coast to Raglan on the west coast.

Schools from both coasts cleaned up their local beaches and harbours resulting in a total of over 600 kg of marine debris being removed, audited, and recycled by over 700 eager students. Prior to

the clean-ups, students learnt lessons such as how the rubbish from our inland towns and cities is connected to the sea through stormwater networks and waterways.

Also during Seaweek, Environment Waikato and the University of Waikato hosted a free lecture series titled 'Changing Coastlines'. Talks included:

- Dr Mark Morrison (NIWA) and Fred Lichtwark (Whaingaroa Harbour Care) – 'Juvenile coastal fish and their nursery habitats';
- Dr Jose Borrero (ASR Ltd) and Professor Emile Okal (Northwestern University) – 'Lessons learnt from two decades of tsunami field surveys';
- Dr Rob Bell (NIWA) – 'Sea level on the move';
- Dr Catherine Beard (Environment Waikato) – 'Sea level rise and coastal vegetation case study'; and
- Jim Dahm (Eco Nomos Ltd Consulting) – 'Increasing coastal community resilience'.

Seaweek is a national event held in March each year. To learn more visit www.seaweek.org.nz.

Bay of Plenty Regional News

Reuben Fraser, Bay of Plenty Regional Coordinator

Coast Care

In response to persistent coastal erosion issues along stretches of Ohope Beach, Whakatane District Council in partnership with Coast Care Bay of Plenty is working to find solutions that work in the area. One potential solution, first proposed in 1997 by a NIWA report, is to recontour the steep, weed-dominated dune scarp. The council elected to recontour the scarp by cutting and then replanting the area with native sand-binding plants.

In late September work began. The four cubic metres of sand per linear metre cut from the scarp was placed landward of the recontoured dune. Two 120 m lengths of beach were worked in this way under the Approved Coast Care Works provisions of the Bay of Plenty Regional Water and Land Plan.

Coast Care staff and Department of Corrections community workers planted the affected sites with *Spinifex* at 1.75 plants per square metre within two days of the recontouring. Since that time, Coast Care contractor Wayne O'Keefe has applied fertiliser and sprayed out any weeds at monthly intervals.

To monitor the effectiveness of the work two coastal profiles were put in at each of the sites along with two non-treatment profiles which are to be used as a comparison. There is another non-treatment profile nearby which has been monitored since 1977. Coast Care Coordinator Pim de Monchy has trained two community volunteers to measure the profiles every month and repeat a series of photo points to provide visual evidence of change.

In the seven months since the work was done there have been no large storm events. Sand has been accreting along most of Ohope Beach during the El Niño conditions during spring and summer, and the treatment areas are no different at this stage. The plants have established spectacularly well and have put out runners up to two metres in length already. The real test will come when the storms of winter arrive. We are watching the area with interest.

Any questions about the project should be directed to either Pete McLaren, Whakatane District Council, at (07) 306 0500 or Pim de Monchy, Coast Care Coordinator, at 0800 368 267.

Figure 1: Newly planted area at Ohope Beach (05 October 2009). Courtesy Whakatane District Council.

Figure 2: Plants developing well (24 February 2010). Courtesy Whakatane District Council.

Chair in Coastal Science

The need for research on the water quality, ecology and physical dynamics of the Bay of Plenty's coastline and estuaries is increasing. This is particularly the case for Tauranga Harbour where continuing development means more high-quality research is needed to enable Environment Bay of Plenty to make sound management decisions.

Fortunately, several agencies and organisations are

planning or undertaking coastal research in the Bay of Plenty over the next three to ten years. Environment Bay of Plenty has a key role to play in encouraging collaboration between these organisations and in driving the research agenda to inform management decisions.

With the above in mind, staff have worked with the University of Waikato to develop a Memorandum of Agreement for a Chair in Coastal Science. The agreement is modelled on the highly successful Lakes Chair and is for a term of ten years at $150,000/annum.

Planning

Not much has happened since the last edition of *Coastal News* – the planning process has been put on hold with planning staff focusing on the creation of the second generation Regional Policy Statement (RPS). Comments from over 30 people and organisations on the coastal chapter of the RPS were received in April and focused on a few main issues:

1. There was mixed support for mapping the landward extent of the coastal environment with the territorial authorities suggesting that it is a regional issue and should be included in the Coastal Plan.
2. There was a call for greater emphasis on strategic spatial planning within the coastal marine area including prioritising anticipated uses within defined development areas.
3. There is recognition that the coastal environment is often a productive, working environment and therefore a more balanced approach between protection and development is needed within the policies.
4. Greater emphasis was sought on a whole-of-catchment approach for coastal management.
5. Greater emphasis was sought on the protection and enhancement of wetlands.
6. Greater recognition of pest plants and animals as a threat to natural character within the coastal environment was also sought.
7. A more balanced approach to the management of mangroves was requested.

The Draft RPS was open for comment between 2 February 2010 and 1 April 2010. Comments received will inform preparation of the Proposed RPS, which is expected to be notified for formal submissions later this year. The first RPS (December 1999) will remain operative until the second is approved. Anyone interested in viewing the Draft RPS can access details through the Environment Bay of Plenty website on www.envbop.govt.nz/Knowledge-Centre/The-Next-Regional-Policy-Statement.aspx.

Port of Tauranga Dredging Hearing

The consent hearing of the Port of Tauranga application to dredge the shipping and entrance channels of Tauranga Harbour was held in Tauranga in March this year. The Port of Tauranga proposes to deepen the channels from 12.9 m to 16 m below chart datum inside the harbour entrance, and from 14.1 to 17.4 m in the entrance channel. The objective of the proposal is to enable Port of Tauranga Limited to accept larger vessels – up to 7000 20-foot equivalent units (TEU) with a draught 14.5 m and length of 347 m. Ships of this size require a channel depth of up to 17.4 m. It is estimated that up to 15 million cubic metres would be dredged as part of this proposal.

At the hearing, strong opposition to the dredging proposal came from tangata whenua of Tauranga Moana. Tangata whenua expressed a number of concerns, including the effects of dredging on culturally significant sites, e.g. the effects on the kai moana (pipi) resource of Te Paritaha o Te Awanui, destruction of a section of the Tanea Shelf, potential erosion of Panepane Point, impacts on Te Kuia Rock, and erosion and sedimentation in areas of the upper harbour.

During the hearing the Port of Tauranga and some of the tangata whenua representatives agreed to enter further talks to determine whether any areas of agreement could be identified. Based on the report back from these talks (which was scheduled for 7 May 2010 just as *Coastal News* was going into production), the hearing committee will decide whether there is sufficient information to close the hearing. If so, a decision (and recommendation to the Minister) would likely follow no later than 4 June 2010.

Hawke's Bay Regional News

Neil Daykin, Hawke's Bay Regional Coordinator

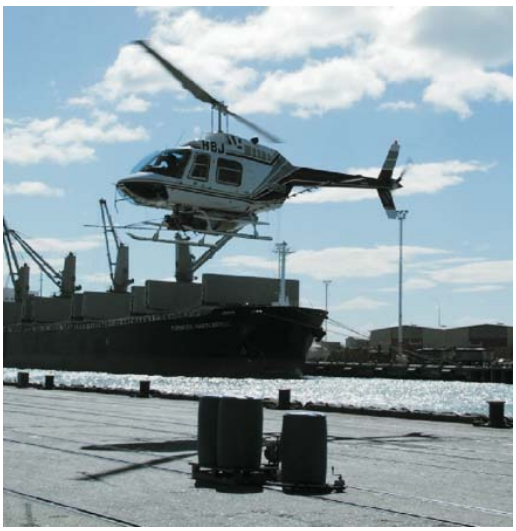
Oil Spill Exercise

Hawke's Bay Regional Council's oil spill response team participated in a response exercise known as 'Exercise Pania Reef' on 25 March 2010. The team worked with the Maritime NZ marine pollution response team, the Coastguard and the Port of Napier to respond to a hypothetical oil spill off Pania Reef. The staff involved in the exercise tested the set up of a response centre, communication links and deployment of oil spill clean-up equipment.

Exercise Pania Reef. Courtesy Hawke's Bay Regional Council.

One of the key objectives of the exercise was to ensure the 'spill' didn't reach the inner harbour and shore where it could have a major impact on wildlife and also be harder to clean up.

A number of lessons were learnt during the exercise, including preferred boom placement. These lessons will be included in the next HB Oil Spill Plan update.



Exercise Pania Reef. Courtesy Hawke's Bay Regional Council.

Swell Events

A low pressure system to the north-east produced east to south-east swells over the period of 5 to 9 March 2010. Data from the Port of Napier Wave Buoy had the maximum wave height reaching 6.3 m and maximum significant wave period of 13s coinciding with the high tide on 7 March 2010. The high tide height was in the middle of the spring-neap tide range but 300 to 400 mm of storm surge elevated water levels to a high spring tide level.

It appears that this swell event was not unusual relative to its size; however, the reported damage appeared to be much more significant than previous events in the last couple of years. Four events in 2009 had maximum wave heights over 5.5 m, three of which were over 6 m and 2008 had three events over 6 m with the largest reaching 7.81 m.

The debris – remnants from the end of January 2010 flood event – that washed up on the beaches may well have made this event appear more dramatic than others. Wave energy levels were similar to the July 2009 event, again not unusual in occurrence or magnitude.

Media and anecdotal reports suggest a number of properties in the Haumoana 21 suffered damage during the storm. Waves and debris spilled across the road at the northern end of the shops on Clifton Road, Haumoana. Although some property damage occurred during this event, caution must be exercised when comparing wave heights against reported swell event damage as it is difficult to assess the impact of conditions prior (previous wave conditions, beach shape/profile and integrity of structures) on any structure or beach, etc.

As the coastline in places like Haumoana retreats

Debris over the road just past the shops on Clifton Road (northern end), Haumoana. Courtesy Hawke's Bay Regional Council.

Wave action around a seawall on Clifton Road, Haumoana. Courtesy Hawke's Bay Regional Council.

Swell event at Haumoana. Courtesy Hawke's Bay Regional Council.

Erosion adjacent to the access road into Clifton Motor Camp. Courtesy Hawke's Bay Regional Council.

due to erosion, seafront properties will be more and more exposed to wave energy.

Erosion and recession of the beach adjacent to Clifton Motor Camp's access road continues. Since November 2009, approximately 10 to 15 m of beach has been lost when the ad hoc defences were removed. The beach is now at the edge of parts of the road.

Hastings' New Sewage Treatment Plant

As Kathy Webb wrote for *BayBuzz* in her 14 March 2010 article 'Stinkin' Pipes':

> *A monumental waste of money, or a marvel of science and cultural sensitivity? The jury is still out, but one thing is sure: almost since the day it was switched on nine months ago, Hastings' new $27 million sewage biological trickle filter system has produced a seriously nauseating smell it wasn't supposed to.*
>
> *Complaints about an awful smell began pouring in last July, shortly after the Hastings District Council switched on the much-heralded new bio-trickle treatment plant, which won the top national prize in the Technology Innovations category of the 2006 New Zealand Post Management Excellence awards.*
>
> *Since then, it's been a nine-month headache for everyone in charge of it or living with it. Every time the plant builds up toward optimum performance, a gut-wrenching stink wafts across East Clive and the tanks have to be switched off. As Hastings Council Chief Executive Ross McLeod puts it, 'there hasn't been any substantial, protracted operation of the plant yet'. Or in other words, screened yet still raw sewage from Hastings District is still being pumped in to the ocean most days.*
>
> *On the other side of the boundary, Napier City Council is still pumping its screened raw sewage in to the ocean as they decide which system to install to treat their sewage.*

To put New Zealand into perspective with other developed nations regarding treatment of wastewater, European nations have had to comply from 1991 with Waste Water Directive 91/271/EEC, which says: "To prevent the environment from being adversely affected by the disposal of insufficiently treated urban wastewater, there is a general need for secondary treatment of urban wastewater."

The directive states that Member States shall ensure that urban wastewater entering collecting systems shall before discharge be subject to secondary treatment or an equivalent treatment as follows:

- at the latest by 31 December 2000 or 2005 depending on population densities; and
- at the latest by 31 December 2005 for discharges to freshwater and estuaries.

So for the last 20 years Europe has been progressively ceasing to discharge raw untreated sewage into waterways with a cut-off date of 2005. Although New Zealand seems to be lagging behind Europe in its approach to discharge of urban wastewater into the coastal environment it is encouraging that some progress is being made in Hawke's Bay towards improving current practice, despite the hiccups being experienced by Hastings District Council.

Taranaki Regional News

Erin Zydervelt, Taranaki Regional Coordinator

Port Biosecurity Surveys

NIWA conducted the annual biosecurity survey of Port Taranaki with assistance from the Department of Conservation and Taranaki Regional Council. The surveys are conducted as part of a national programme looking for specific invasive species.

The biodiversity survey team conducted diving surveys, deployed pots to catch invasive crabs and sea stars, used a sledge dredge to survey the seafloor, and conducted beach cast surveys. The surveys were conducted in the Port Taranaki area and around Sugar Loaf Islands. No invasive organisms were found during the survey.

NIWA Biosecurity team collecting crab pots from a wharf in Port Taranaki. Courtesy Bryan Williams, Department of Conservation.

World First in Bridge Design and Extension of New Plymouth's Coastal Walkway

New Plymouth's coastal walkway is a seafront promenade running the length of most of the city – seven kilometres from Port Taranaki to the Waiwhakaiho River. The coastal walkway is being extended over the Waiwhakaiho River an additional three kilometres to reach Bell Block.

The design and build of the bridge to connect the two sections of the coastal walkway was started as a competition run by the New Plymouth District Council. The design brief specified the bridge had to be over 70 m long, aesthetically pleasing and iconic. Whitaker Civil Engineering Ltd along with Novare Design and CPG consultants won the competition, and the project started in late 2007.

The physical construction of the bridge began in September 2009, and the bridge is due to be opened

The bridge in place over the Waiwhakaiho River. Inset: Boxing for reinforced concrete and view across Waiwhakaiho River where Te Rewarewa Bridge will connect the existing and new section of the walkway. Both photos courtesy Whitaker Civil Engineering Ltd.

on 5 June 2010. A world first in bridge design, the Te Rewarewa Bridge – depending on the angle it is viewed from – looks like a breaking wave or whale bones. The bridge is constructed of three large tubes made of fabricated steel forming an archway on reinforced concrete. One end of the bridge moves to accommodate thermal contraction and expansion (springing). This structure has been designed at the cutting edge of bridge design. In fact, the bridge's designers have recently been invited by a bridge organisation in Europe to take part in an international quality award.

Pilot Project to Harness Wave Energy

A research and development project has been started in Taranaki to develop a wave-energy device to produce power. The consortium behind the project includes Crown Research Institute Industrial Research Ltd and Power Projects Ltd.

Known as the Wave Technology New Zealand (Wet-NZ) project, two quarter-scale models of the device have already been trialled near Christchurch. The next step in the project is to build a half-scale model that will be based 4.3 km offshore from Waitara. At its peak, the half-scale device is expected to generate up to 20 kW of electricity, but will average about 10 kW.

To place the device, Wet-NZ will require a resource consent from the Taranaki Regional Council. If successful in their application, the project researchers hope to deploy the device late in 2010.

The consortium received $760,000 from the government's Marine Energy Deployment Fund to build the half-scale device.

Southland Regional News

Ken Murray, Southland Regional Coordinator

Cleddau Flood Protection Project

To reduce risk from major flood events at Cleddau Village (which is located on the Cleddau River delta at the head of Milford Sound, Fiordland), the Department of Conservation (DOC) plans to carry out significant flood and seawater inundation protection works in the area, including:

- constructing or upgrading approximately 1.5 km of flood defences on the Cleddau River;
- landscaping (raising ground levels) and improving drainage and infrastructure at the Cleddau Village site to safeguard the area from flooding; and
- reinstating and improving the working areas and waterside facilities adjacent to the Cleddau Village/Deepwater Basin Area.

One of the long-term goals of the project is to reduce the risk of flooding at the Cleddau Village site so that sustainable accommodation and other facilities for workers and visitors to Milford Sound can be built. Currently, due to the high flood risk, construction of new facilities is extremely limited.

DOC has hired URS New Zealand Ltd to prepare a detailed design for the flood protection works, as well as to prepare an application for appropriate consents. Early consultation on the project was held late in 2009 with the main stakeholders. Further consultation on the project was held in late April 2010. It is anticipated that the project will begin January 2011 and be completed by February 2012.

Coastal Zones and Climate Change

The International Symposium on Coastal Zones and Climate Change was held in mid-April at Monash University Gippsland, Churchill, Victoria, Australia. It was attended by people from a wide range of countries from Bangladesh and Vietnam to Brazil and the United States.

The focus of the conference was to look at the impacts of climate change in coastal areas, and to discuss adaptation strategies. The two keynote speakers set the scene for the rest of the conference: focusing on modelling and planning.

Dr Kathleen McInnes, CSIRO, presented work on modelling storm surges under current and future climate conditions. She has undertaken numerical modelling studies of tides, storm surges and coastal flooding in various locations such as Cairns, the Gold Coast, the Victorian coast, the NSW coast, Tasmania, Tuvalu, and Fiji. Kathleen was involved in two recently completed coastal vulnerability studies for the Sydney Coastal Councils and the Western Port Region. These studies applied integrated approaches to addressing climate vulnerability at the regional scale to assist councils in managing and adapting to the risks posed by climate change.

Mr Duncan Malcolm AM, JP (Chair, Victorian Environmental Assessment Council) spoke on how change can be achieved in the context of current democratic society in Australia. Some 85% of the coast in Gippsland is classified as erodible and many areas will be prone to inundation if there is a 0.8 m sea level rise. Duncan spoke of the importance of engaging and informing the community on climate change impacts and how that groundswell of knowledge could lead to policy and political changes.

For one community in Gippsland, this type of engagement has resulted in a requirement that for new development a climate change plan must be submitted which identifies how sea level rise will be addressed.

Other Highlights

- Nick Wynn from Australia's Future Coasts Program discussed a state-funded project to gather information on the vulnerability of communities and develop guidance material to assist coastal land managers and decision-makers in planning in terms of roads, infrastructure and other public facilities.
- Fernando Santos from New University of Lisbon presented a theoretical approach to resilience for planning and managing coastal areas. His contention is that resilience can be enhanced through planning processes to assist coastal communities in adapting to climate change challenges.
- Md Mafizur Rahman of Bangladesh discussed a cost-effective adaptation strategy for the disaster prone areas in the coastal regions of Bangladesh. Mafizur noted that most of the southern reaches of Bangladesh are disaster prone and are affected by flooding nearly every year.

  In Bangladesh, affordable adaptation strategies are being proposed which modify the landscape to increase resilience. This includes creating mounds where people and stock can retire to in the event of inundation (and using the depression for fish farming), bunding fresh water supplies to keep storm surges out, introducing saline tolerant crops, limiting living areas to beyond initial stopbanks, and replanting vegetation on the seaward side of stopbanks.
- Wright, Dutta & Rayment of Monash University presented two papers on the use of synthetic impact response functions for the analysis of vulnerability and adaptation measures.

  With an increasing concern that the current management practices for many coastal regions are unsustainable, the research team have been working on a system to better assess the socio-economic and environmental impacts of sea level rise. Their research will assist in a better understanding of the vulnerability of coastal zones, and contribute to devising adaptive and integrated management principles.

This is all just a taste – the conference had a number of interesting papers. Many thanks go to the organisers for arranging such a good event. Visit www.monash.edu.au/cemo/czcc2010 to learn more.

Robin Britton

NZCS Corporate Membership

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.

Current Corporate Members of the New Zealand Coastal Society and this issue's member profile are shown on the following page.

For more information on corporate memberships and benefits, please contact:

Kath Coombes
Membership Coordinator
Coastal Society Committee
kath.coombes@arc.govt.nz

Coastal
News

MACCAFERRI
Engineered Environmental Solutions

Coastal erosion is a major problem with local governments and coastal property owners looking for solutions to protect their valuable assets and shorelines.

We are seeing a growing number of local communities demanding that their councils apply innovative solutions to maintain the foreshore areas and balance the environmental concerns with the high level of need for ongoing public access and use.

For over 20 years, Maccaferri NZ and manufacturer Geofabrics Australasia have been providing geosynthetic solutions for costal erosion resulting in the development of the ElcoRock® shoreline protection system to meet this demand.The ElcoRock® shoreline protection system has been at the forefront with state of art developments such as unique vandal deterrent geotextiles, specialised filling and placement equipment and a proven compatibility with marine ecosystems.

The ElcoRock® shoreline protection system is comprised of extremely robust geotextile containers designed to be filled with sand, soil, gravel, recycled material, treated materials or a combination of the above such that they form a stable, durable container for coastal applications. The containers are based on ElcoMax®, a specifically manufactured nonwoven, needle punched, staple fibre geotextile to enhance filtration, puncture and abrasion. The fibres used are specially treated for enhanced UV resistance for these exposed applications.

There have been a growing number of global marine projects which have successfully utilised the ElcoRock® shoreline protection system in New Zealand, Australia and the Pacific Islands. The latest of the local projects has been at Waihi Beach 3 Mile Creek. This is the first wall structure using 2.5 m (Medium) ElcoRock® containers to be constructed in New Zealand and using the specially designed purpose built J-Bin Hopper filling system. This project is also the largest river training groyne structure ever built in New Zealand using Medium ElcoRock® containers. ElcoRock® containers are supplied in typical sizes of 0.35 m^3, 0.75 m^3 and 2.5 m^3.

For more information on ElcoRock®, please visit our website www.maccaferri.co.nz or contact Simon Moran on 0800 60 60 20.

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

Beca · CPG · OCEL · Environment Canterbury Your regional council · Environment Waikato Regional Council · MACCAFERRI Engineered Environmental Solutions · NIWA Taihoro Nukurangi · Northland Regional Council · Taranaki Regional Council · Tonkin & Taylor