Coastal news

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Figure 1: Te Puna Estuary during low tide, November 2007

Nutrient Dynamics in Shallow, Tidally-dominated Estuaries

Article by the 2007 winner of the NZCS Student Scholarship
Hui Woon (Yvonne) Tay

Over the last century estuarine environments have undergone dramatic changes. Increased nutrient loading is a problem in estuaries worldwide (Boesch 2002), including in New Zealand. We lack good long-term datasets to understand and study this problem. The data that we have in NZ tell conflicting stories, and are difficult to interpret as many were collected at random intervals or during different parts of the tidal cycle. This study aims to contribute towards our understanding of estuarine nutrient processes through the analysis and interpretation of data collected during rigorous field experiments.

Estuarine environments are distinct from rivers and lakes since estuaries receive both oceanic and catchment inputs. Excessive nutrient inputs, coupled with undesirable environmental and physical conditions, can promote algal blooms that decrease water quality (Justic et al. 1995; Boesch 2002).

Nutrients derived from surrounding catchments, and the recycling of nutrients in sediments (Fisher et al. 1982), along with water column processes and shelf-water exchanges contribute towards nutrient availability (Morris 2000). However, the role of intertidal flats in influencing nutrient variability over short-term periods in tidally-driven estuaries has not been well-established.

Tidal flats are characterised by rapidly-varying water depths, both in time and space, with the additional influence of air exposure and the potential to resuspend sediments within the water column (Widdows et al. 2004).

The aim of my PhD research is to understand short-term variability of nutrient dynamics in shallow, tidally-driven estuaries over the course of the tidal cycle. In addition, interannual variation in nutrient

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concentrations will be studied to quantify long-term fluxes in nutrients

Tauranga Harbour was chosen as my field site as it has large intertidal sandflats (~60% of the harbour area). The harbour is also facing increased pressure from coastal and catchment development. Two sub-estuaries in the southern basin of Tauranga Harbour were chosen as my sampling sites: Te Puna Estuary (Figure 1) and Waikareao Estuary (Figure 2).

Waikareao Estuary receives water directly from the shelf, while Te Puna Estuary receives water mostly from the upper parts of the harbour. These two sub-estuaries also drain catchments of different sizes characterised by different levels of urbanization and have different morphologies, thus providing contrasting examples in which to understand short-term water quality variability.

To be able to answer the key questions, seasonal samplings, every 3 months, are undertaken at the two case study estuaries. The field sampling involves taking hourly sampling of surface and bottom water over a 24-hour period at each estuary. Current meters are deployed at the channel and estuary mouth at each site. Conductivity, temperature and depth (CTD) casts are also taken every hour to provide data on the physical parameters of temperature, salinity, dissolved oxygen and density.

To date I have completed half my field sampling (November 2007-early summer, and March 2008-late summer/early autumn). Preliminary results from the CTD casts show that in November 2007 the estuaries were well-mixed, while in March 2008 a two-layered flow dominated the two estuaries.

Preliminary results also show that nutrient concentration was higher on the outgoing tide for both the day-time and night-time cycles in the two estuaries, with Waikareao Estuary having higher concentrations of phosphate and nitrate, while Te Puna had higher concentrations of ammonia.

Sampling will be conducted again in June 2008 (late autumn/early winter) and in September 2008 (late winter/early spring). Historical data along with that from the seasonal field sampling will be used to set-up and calibrate a three dimensional hydrodynamic-biogeochemical model of the two estuaries using ELCOM-CAEDYM (the coupled 3D Estuary and Lake Computer Model and Computational Aquatic Ecosystem Dynamics Model), a framework developed by the Centre for Water Research in Australia.

The anticipated results will provide some baseline data on the current nutrient situation to aid in assessing the water quality in the two Tauranga Harbour estuaries. The ability to predict and mitigate changes in water quality is necessary as the surrounding catchments of Tauranga Harbour are becoming more urbanised and are undergoing substantial industrial and causeway construction, developments which have the potential to significantly affect the water quality of the case-study sub-estuaries.

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Figure 2: Intertidal flats exposed at Waikareao Estuary during low tide, November 2007

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Figure 3: Adrian Brannigan taking a CTD cast at Te Puna Estuary, March 2008

NZCS Student Research Scholarship

Current and predicted pressures pose significant challenges for managers and planners seeking to provide sustainable futures for coastal environments and communities. The New Zealand Coastal Society (NZCS) was inaugurated in 1992 to promote and advance sustainable management of the coastal environment. This includes fostering coastal research and capacity building.

The society offers a NZ$5,000 scholarship annually to support a Masters or PhD student conducting research that has the potential to contribute towards the aims of the society.

The recipient must undertake the research project while enrolled for a Masters or PHD degree in a New Zealand institution. S/he may already be enrolled and conducting this research, for a Masters student up to 0.5 EFTS, or for a PhD candidate up to 2.0 EFTS, prior to the scholarship application deadline.

Application forms are available from supervisors or by contacting Hannah Hopkins (hannah.hopkins@ew.govt.nz). Applications close 5pm 22/8/08 and winners will be made at the annual conference which will be held 18-20 November in New Plymouth and is themed 'Coastal Co-existence: Industry, Culture and Environment'. For further information see www.coastalsociety.org.nz/About.htm and/or contact David.Kennedy (david.kennedy@vuw.ac.nz).

NZCS Student Conference Award

The 2008 NZCS Student Conference Award includes free registration plus NZ$500 towards expenses for a student to attend the NZCS 2008 annual conference which will be held 18-20 November in New Plymouth and is themed 'Coastal Co-existence: Industry, Culture and Environment'. The winner must present an oral or poster paper at the conference.

Applicants must be currently enrolled in a degree programme with a focus on coastal studies, or no more than one year post-graduation from such a programme. Research to be presented must have been performed in large part by the applicant, while s/he was a student.

Application forms are available from supervisors or by contacting Hannah Hopkins (hannah.hopkins@ew.govt.nz). Applications close 5pm 22/8/08 and winners will be notified by email within 6 weeks.

Coastal Co-existence: Industry, Culture and Environment

NZCS Conference, New Plymouth 18 – 20 November 2008

The theme of this year's conference focuses on issues around managing the ever increasing growth occurring on New Zealand's coast, and in particular the ways that industry, culture and the environment co-exist.

The conference is being held at the New Plymouth Club, a central city location overlooking the famous wind wand and coastal walkway.
The call for papers is out with presentations sought for sessions about, but not limited to, the following:

- Planning coastal communities.
- Climate change.
- Coastal hazards.
- Ports, harbours and marinas.
- Aquaculture.
- Ocean and coastal engineering solutions.
- Oil spill issues.

The deadline for oral and poster presentation abstract submission is 15 August 2008. Abstracts are invited on all aspects of coasts, especially for the themed sessions (please indicate if your paper fits into one of these).

For more information and a submission form see the website www.coastalsociety.org.nz or contact Kate at kate.giles@trc.govt.nz.

Registrations for the conference will be open late June/early July. Check the website for details.

Check out www.taranaki.co.nz and click on the accommodation tab for a range of lodging options, from backpackers to deluxe.

We look forward to seeing you all there!

2008 conference team

The Taranaki coast near New Plymouth

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 (e-mail: hannah.hopkins@ew.govt.nz)

Conferences and Workshops

Coast to Coast 2008
August 18-22, 2008, Darwin, Northern Territory, Australia

www.coast2coast.org.au/

GIS/Spatial Analyses in Fisheries and Aquatic Sciences
August 25-29, 2008

www.fao.org/fi/gisfish/index.jsp.

International Conference of Coastal Engineering
31 August - 5 September, 2008, Hamburg, Germany

icce2008.hamburg.baw.de

International Conference on Ocean Energy (ICOE 2008)
October 15-17, 2008, Brest, France

www.icoe2008.com/

Annual New Zealand Coastal Society Conference 2008

Coastal Co-existence: Industry, Culture and Environment
November 18-20, 2008, New Plymouth, New Zealand

www.coastalsociety.org.nz

LITTORAL 2008 - "A changing coast: challenge for the enviromental policies"
25-28 November 2008 Venice, Italy

www.littoral2008.corila.it

Consequences of Climate Change and Flood Protection
November 26-28, 2008, Hamburg, Germany.

www.acqua-alta.de

2008 ICCE International Symposium on 'Sediment dynamics in changing environments'
December 1-5, 2008, University of Canterbury, Christchurch, New Zealand.

www.civil.canterbury.ac.nz/icce2008.

International Symposium on Deep Sea Corals
1-5 December 2008, Wellington, New Zealand.

coral2008.niwa.co.nz/index.php

3rd International Conference in Ocean Engineering

1-5 February, 2009, Madras, India

www.oec.iitm.ac.in/icoe2009/index.html.

Coasts and Ports: 'In a dynamic environment'
16-18 September, 2009, Wellington, New Zealand

www.coastsandports2009.com

NZCS Regional Coordinators

Every region in the country 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

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Meeting the Challenges of Coastal Regional Management through Environmental Monitoring

John Zeldis and Philip Gillibrand of NIWA and Rob Smith of Tasman District Council describe an exciting development in New Zealand capabilities for real-time coastal monitoring.

Important regional issues face managers of coastal environments in New Zealand and nowhere is this better illustrated than in the Nelson Bays area.

Applications for Aquaculture Management Areas (AMAs) under consideration in the Tasman District indicate that a rapid expansion in mussel farming is possible in future, encompassing thousands of hectares in both of Nelson's bays, Tasman Bay and Golden Bay. Assessing impacts of such farming on water column and benthic environments requires good prior knowledge of baseline biological conditions and hydrodynamics.

Managers also need information on the natural environment supporting farming – we know that ocean variability in Cook Strait and beyond has a dominant effect on the supply of chemical nutrients to the bays, supporting primary production and grazing mussels. Mussel industry managers have an obvious interest in this, as do managers of the scallop fisheries, where natural variability has seen the fishery value fluctuate dramatically over the years. Thus understanding, and predicting, ocean-bay exchange is critical.

The AMAs are also subject to sediment-borne bacterial and viral contaminants from local rivers, and to understand the movements of these sediment plumes we need detailed near-shore hydrodynamics capability, interfaced with knowledge of catchment runoff dynamics.

Finally, with sea-level rise on the cards over the coming decades, decisions made now by local authorities on zoning new regional development (and indeed, on security of current infrastructure) will resonate well into the future. These decisions must be informed by the best possible predictions of future change, including storm-surge inundation from the bays. These can only be acquired through a strong modelling capability supported by marine environmental information.

In response to this, Tasman District Council and NIWA have collaborated to install and maintain an advanced marine buoy system that gathers environmental information required to meet these challenges.

Monitoring the Golden Bay environment

In May 2007, a marine buoy was deployed in Golden Bay (Figure 1). It comprises New Zealand's most comprehensive coastal observation platform and is a floating environmental monitoring station, collecting and transmitting near real-time data back to shore.

The buoy is moored in about 30 metres of water, and on-board is a suite of above- and below-water instrumentation. Above-water meteorological instruments are recording solar radiation, wind speed and direction, barometric pressure and air temperature; there is also an accelerometer for measuring the size and frequency of waves.

Below water, an Acoustic Doppler Current Profiler (ADCP) measures the speed and direction of

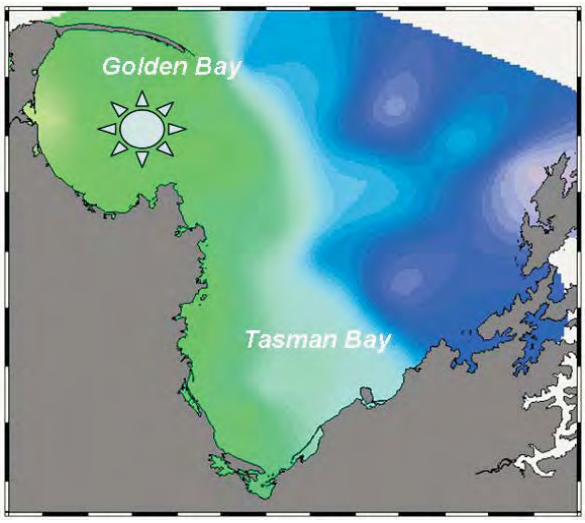

Figure 1: (left) The location of the Golden Bay buoy, plotted on a map of Nelson Bays showing annual average chlorophyll concentration (an index of phytoplankton) in the water. The buoy is located in a highly productive area, and we expect it will provide information on the environmental drivers of the productivity. (Right). The buoy has an array of instruments both above and below water line.

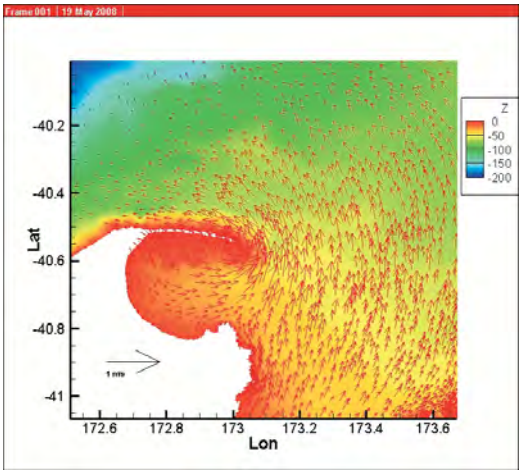

Figure 2. Surface currents simulated by the hydrodynamic model during an ebb tide in Golden Bay. Water depth is shaded. Note that only every fifth current vector in the model is plotted.

water currents through the water column beneath the buoy and returns the results in real time, another New Zealand first. Other below-water instruments measure water quality indicators including temperature and salinity, light levels, chlorophyll (as an index of phytoplankton abundance) and turbidity – essential data for establishing baseline conditions in the bay at its interface with open Cook Strait waters.

We expect these data to be crucial for understanding the causes of variation in nutrient supply and productivity in the bays over seasonal and yearly time scales – for example in response to El Niño Southern Oscillation (ENSO). Along with other monitoring information collected within AMAs, the data will help us to understand natural variability and distinguish it from farm effects that may arise.

Data for improving ocean forecasting

NIWA is using the Golden Bay buoy data to calibrate and test a coastal hydrodynamic model which is used routinely to predict storm surge height around NZ as part of the operational environmental forecast system 'EcoConnect' (Figure 2).

Presently, we are using current, wave and atmospheric pressure data collected during the passage of tropical cyclone 'Funa' over the Nelson Bays in late January 2008 to test modelled responses to the cyclone (Figure 3).

Figure 3. A sample of data collected at the Golden Bay buoy during January 2008 when tropical cyclone 'Funa' passed over NZ: atmospheric pressure (top), wind velocity (middle) and near-surface water currents (bottom). The passage of the cyclone during 20–22 January 2008 is highlighted in grey, and is marked by a rapid drop in pressure and a switch from northward to southward winds.

The Golden Bay buoy provides valuable information on the quality of the data being used to drive the hydrodynamic model. With the ADCP providing data on local water currents, the combined dataset gathered by the buoy allows us to assess both the input to the model and the output from it, helping evaluate the performance of the model and identify sources of error in its predictions.

Data for councils, industries and the public

The Golden Bay buoy is likely to stay where it is for several years. NIWA will use it as a test-bed for new instrumentation, and procedures for data retrieval, storage, and transfer to a range of onshore users. The data are being returned in near real-time over a GPRS cellular link, much of which feeds into the web, for viewing on the Tasman District Council website: www.tasman.govt.nz/index.php?GoldenBayMetbuoyGraphs. These provide valuable information on sea and weather conditions for users such as the local scallop fleet, fishing industry, and recreational sea-goers. Actions are now underway to further extend its capabilities.

Acknowledgements

The authors wish to thank Tasman District Council, the Envirolink Advice Grant Fund, and the NIWA Capability Fund for support and maintenance grants for the buoy project. Modelling capability is developed by Roy Walters and Alison Kohout prepared Figure 2. We thank the NIWA Instrument Systems Group for continuing assistance with the project.

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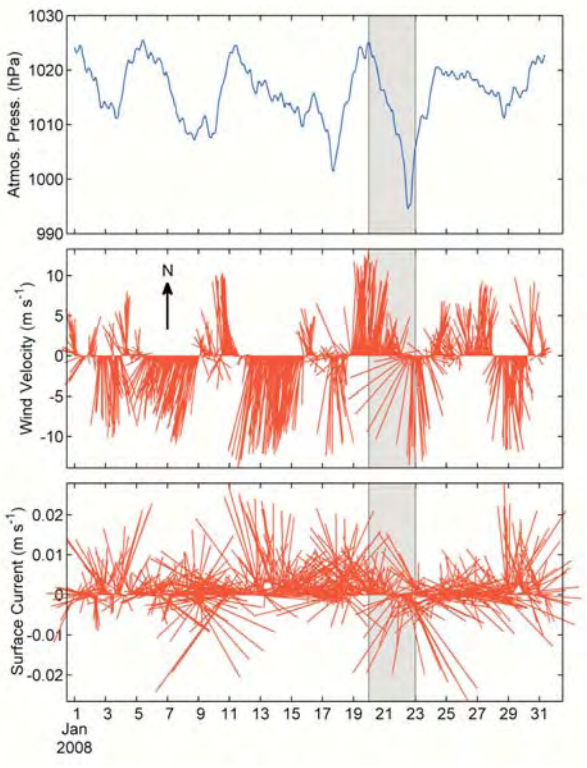
& Philip Gillibrand, NIWA
Rob Smith, Tasman District Council



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Harbour Drive Beach Enhancement, Tauranga Harbour

A sustainable approach to inner harbour shoreline rehabilitation has been undertaken by Tauranga City Council and environmental and engineering consultants Tonkin & Taylor.

Harbour Drive is located along the shores of Tauranga Harbour, and has undergone morphological change due to human induced modifications in the harbour. The modifications include the adjacent rail bridge over the Waikareao Estuary, the construction of the Sulphur Point reclamation in the late 1970s and possibly increased offshore wave energy into the harbour due to deepening of the main entrance channel.

The reduction of wave energy from the north east, due to wave sheltering of Sulphur Point and the modification of the inlet to the estuary by the rail bridge, resulted in predominant long shore sediment transport to the east. With no significant sediment supply to the west and loss of sediment into the Waikareao channel to the east, the shoreline developed a negative sediment budget.

The resulting shoreline retreat reduced the width of Tauranga City Council's (TCC) recreational reserve, causing loss of amenity along a popular stretch of the harbour shoreline.

To mitigate the loss of recreational reserve, a rock rip-rap structure was constructed along the majority of Harbour Drive in 2003. A portion of the shoreline was left unprotected to maintain public access to the water and maintain a soft shore beach.

The unprotected soft shore portion to the east of the rip-rap structure subsequently required further remediation, due to the ongoing sediment budget deficit and localised end effects of the rip-rap structure. To compound matters, severe erosion during a storm in November 2005 resulted in a newly constructed walkway and carriageway being put at immediate risk.

Temporary, emergency measures were undertaken to protect the remaining shoreline and infrastructure. However, a sustainable long term solution was required.

Beach re-nourishment was recommended as a sustainable solution to maintain public access and enhance the amenity values in the area. An adequate control structure was also needed, or any placement of sand would quickly be lost.

A number of issues concerning the control structure's impact/effect on the local environment had to be addressed. A storm water outflow onto the soft shore beach both exacerbated the existing erosion and would also be detrimental to any placed sand.

A popular soft shore beach in the lee of the control survives on sediment supplied from the west. Therefore, nourishment of the leeward beach was required. As a note, this beach originally formed after the Sulphur Point reclamation as a result of the sand supply from the eroding Harbour Drive shoreline.

An issue that affects all of Tauranga Harbour is the accumulation of sea lettuce along the shoreline, especially during high growth seasons. Any control structure is likely to trap a certain amount of seaweed. However, sea lettuce only becomes a nuisance along the shoreline when large amounts are continually trapped and begin to rot.

Although the Harbour Drive area and surrounding shorelines are considered highly modified, the structure needed to integrate visually and maintain public amenity and access.

Therefore, the desired functions of the control structure included:

Inner harbour erosion (left) causing risk to public amenity and infrastructure.
Subsequent beach enhancement (right) after beach re-nourishment and control structure.

- Sediment entrapment.
- Mitigation of existing storm water outflow.
- Allowing (some) sediment bypassing.
- Mitigation of sea lettuce accumulation.
- Maintaining public access.
- Integrating with the modified surroundings.
- Adding to the public amenity.

To accommodate the above functions a semi detached rock groyne was proposed. A groyne is a hard structure orientated perpendicular to the shoreline. The primary purpose of the groyne in this case is to retain placed sand.

The groyne is approximately 25 m long with a crest elevation at Mean High Water Spring. The existing storm water outflow was redirected to pass through the groyne and exit at the seaward end. The groyne is semi detached as a high tide beach remains at the landward end.

The high tide beach provides public access along the foreshore and also encourages some sediment bypassing during large wave events. The groyne has also become a prime fishing location.

The seaward end of the groyne terminates near a secondary channel. Tidal currents and wave action should allow sea lettuce to become dislodged and reduce potential accumulation within and near the groyne. Should accumulation occur, especially during high growth seasons, triggers are in place to allow removal of the offensive material. The removal of sea lettuce in high amenity areas is undertaken by TCC in extreme circumstances.

The beach re-nourishment and groyne construction was completed in February 2008.

Approximately 1000 m^3 of sand (sourced from Port of Tauranga dredging operations) was placed on the foreshore to form a high tide beach. Sand was also placed within the rock rip rap. The sand trapped in the voids of the rock rip rap acts as a storage cell and allows a gradual movement of sand onto the re-nourished beach.

Beach maintenance will involve regular monitoring and 'top ups' as the sand volume reduces over time. A hierarchical system of maintenance work ensures the new beach system is sustainable. Depending on the state of the beach, maintenance work may only require re-distribution of sand within the beach/groyne system. If required, additional sand will be sourced from a natural accumulation area (shoal) near the beach.

Port of Tauranga dredged material will be utilised if the volume of sand required is greater than that available from the shoal. All sand used for capital or maintenance requirements is sourced from Tauranga Harbour.

The preferred method of shoreline rehabilitation is assessed on a case by case basis, as the processes and public amenity aspects vary between sites. In the case of Harbour Drive Tauranga, a sustainable beach re-nourishment and groyne approach has enhanced the amenity and recreational value of the area.

Rick Liefting (RLiefting@tonkin.co.nz), Glen Nicholson and Mark Ivamy - Tonkin & Taylor.
Paul Hanson (Paul.Hanson@tauranga.govt.nz) - Tauranga City Council.

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For any enquiries regarding Coastal News articles or advertising please contact **NZCS Editor** Alex Eagles (penguins@clear.net.nz).

Coastal News

Word from the Chair

Of interest to many of you recently will have been the Proposed New Zealand Coastal Policy Statement 2008 that was notified for submissions in March. While submissions have now closed, the next step will be for the Board of Inquiry to hear submitters and produce a final version. The Institute of Professional Engineers of New Zealand, which the Society is a Technical Interest Group of, has made a submission on behalf of its members to the NZCPS. Thank you to those members who took the time to provide comments to that submission.

At the 2007 NZCS Conference in Tauranga we awarded John Lumsden with life membership of the Society. John is our second recipient of this award and recognises the outstanding contribution that he has made in not only helping to establish the Society, but as a long-serving member of the NZCS Management Committee over the past 15 years.

The organisation for the next Australasian Coasts and Ports Conference at Te Papa in Wellington from 16-18 September 2009 is progressing well. The theme of the conference is Coasts & Ports in a Dynamic Environment. This theme covers the challenges of environmental change, innovations in maritime industries, and policy and planning for dynamic environments. A separate conference website has been set up which will contain details on the conference, call for papers and registrations in due course. You can register your interest in the conference now by visiting the website www.coastsandports2009.com.

A reminder to book your diaries for the New Zealand Coastal Society Annual Conference for 2008, which is being be held from 19-20 November in New Plymouth at the New Plymouth Club.

The theme of the 2008 conference is "Coastal Co-existence: Industry, Culture and Environment". Taranaki has an enormous variety of coastal issues and the conference organising committee is promising yet another great conference. Papers for the 2008 Conference will be called for in late June, with oral and poster papers sought related to the conference theme. Registrations will open in July so be in quick. More details will posted on the coastal society website shortly www.coastalsociety.org.nz/conference.

Our inaugural Student Research Scholarship winner, Hui Woon (Yvonne) Tay, has started her field work and we await the initial findings of her doctorate research with interest. Applications for this year's award are open to any masters or doctorate student studying a coastal related topic in New Zealand. There are also the two $500 student travel scholarships to attend the 2008 NZCS Conference in Taranaki. Application details for both awards are available from the NZCS website.

The results of the 2008 survey of members is presented in this edition of Coastal News. Satisfaction with the annual conference and Coastal News continues to remain very high, with a lower level of satisfaction with regional events and our website. From your feedback, the NZCS Management Committee will be focusing on improvements to the website and on giving more assistance with holding regional events.

We will be endeavouring to ensure that the NZCS e-mail digest is regularly sent to members and contains relevant information. If you have any announcements, information or notices for inclusion in the digest please send to Hannah Hopkins (NZCS Administrator) at hannah.hopkins@ew.govt.nz. Similarly if you have any ideas for an event in your region or can assist with organisation of an event, please contact your regional coordinator.

I look forward to seeing you all in Taranaki in November for this year's NZCS Conference. Until then, keep safe.

David Phizacklea
Chair, New Zealand Coastal Society
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Aquaculture Dialogue

WWF is working with industry, government, scientists, iwi and other NGOs to develop an environmental standard for Greenshell™ mussels, Pacific oysters and other mollusc species in New Zealand.

"As wild fish stocks decline, more and more countries are turning to aquaculture as a food source," says Rebecca Bird, Marine Programme Leader. "In fact, aquaculture is thought to be the fastest-growing food production system in the world. WWF's goal is to ensure that the growth is environmentally sustainable. Working with industry and government to establish performance-based and measurable standards is one way we can work toward this goal."

WWF-International's Dialogue coordinator Colin Brannen visited Nelson in mid-April to initiate discussions. "WWF has convened a series of regional Dialogues, including in NZ and in Australia, to help countries develop standards for responsible mollusc farming. NZ is already considered a world leader in sustainable aquaculture production. Establishing and complying with standards will be an important step for the industry to take in order to keep this edge."

Want to learn more about the Aquaculture Dialogues? Visit: www.worldwildlife.org/what/globalmarkets/aquaculture.

Preventing Drowning and Injury in New Zealand

Our coastline continues to be enjoyed by an increasing number of people, be it through coastal development or increased access to water-related opportunities.

Social commentators suggest there is an increase in 'family' orientated leisure pursuits and a day at the beach is accessible, offers a range of activities, and can be enjoyed by all. This is reflected in our statistics, which continue to report more patrol hours than ever before:

- Hours worked 183,351
- Rescues 1,870
- First Aids 1,756
- Searches 345

(current as of 30 May, 2008)

As a not-for-profit community service, the most significant aspect for Surf Life Saving is that we continue to deliver more and more. It is imperative that these increased efforts pinpoint areas where we can really make a difference to preventing drowning and injury in New Zealand.

To help guide and achieve this, Surf Life Saving has identified the four (4) causal factors associated with drowning and set realistic and achievable goals to counteract each of these factors. Each goal is ultimately supported by a number of interventions to actually get the job done on the coast.

1. People drown because of a lack of knowledge or a disregard/misunderstanding of hazards

Surf Life Saving must aim to educate and inform by increasing knowledge through quality public education and awareness. This increase in knowledge will assist the beach going public of New Zealand participating wisely and safely in our environment. Interventions need to be direct (educational programmes) and indirect (awareness orientated, e.g. media).

2. People drown because they have unrestricted access to hazards

People have free access to virtually all the New Zealand coastline. Surf Life Saving needs to understand this coast in order to create safer environments for the public. Knowledge, identification and prioritisation of coastal hazards will enable Surf Life Saving to form partnerships with land managers in order to implement control measures ranging from bylaw changes to standardised water safety signage.

3. People drown because of a lack of supervision or surveillance

'Lifesaving services' covers the preventative and rescue aspects of our organisation. Such services are often the last chance for people in trouble in the ocean. We now need to build on our firm foundations and fill gaps innovatively. Surf Life

Saving must 'think outside the square' when it comes to providing new interventions including initiatives ranging from cctv coverage to call-out squads and support operations.

4. People drown because of their inability to cope once in difficulty

A determined effort to increase survival skills will contribute to a population of New Zealanders who can use the country's many beaches safely and skilfully. The fact that hazards exist at beaches means we must look for ways to increase the ability of people to survive in an environment they are unfamiliar with. 20% of people who drown on the coast never actually intended on being in the water in the first place.

In summary there is a need to tackle challenges as 'one organisation' through an aligned approach. This approach also needs to be based on evidence. It is also imperative that effective partnerships are formed, both international and domestic, with groups who can add value and ultimately save lives on the New Zealand coastline.

Brett Sullivan, Surf Life Saving New Zealand
brett.sullivan@surflifesaving.org.nz

Aquaculture into the Classroom

The New Zealand government has developed a learning resource, "Aquaculture in Action", that is geared to help students learn more about aquaculture in New Zealand. The web-based resource includes seven fact sheets that are available in both English and te reo Maori. The resource also includes teacher lesson plans and curriculum links.

At a launch of the Government's te reo version of the resource, Te Ahumoana a-mahi, in early May at Te Kura o Manaia on the Coromandel Peninsula, marine farming pioneer Harry Mikaere said the fact sheets took an important industry, for the Coromandel and the country, into the school environment. He said that the students of today had a future in aquaculture, "not only on the farms, but also in the boardroom and in the sciences involved in this industry, particularly in innovation and entrepreneurial leadership".

"Educating students about aquaculture was also about ensuring they knew about the resource consent process and recognised the sustainability of the industry", he added.

Harry's brother Martin Mikaere is tumuaki (principal) of Te Kura o Manaia. Martin says aquaculture is part of the very fibre of the small coastal Maori community, with the students having grown up collecting seafood and many of their parents involved in the local mussel and oyster industries.

Aquaculture New Zealand Chairman Peter Vitasovich said the launch at Manaia highlighted the role of the industry in local community development and growth.

Aquaculture often occurred in areas where other employment opportunities and industries had dwindled and it would benefit those regions "to have the knowledge they need to play a role in the industry's future from an early age", he said.

Maori Affairs Minister Parekura Horomia, who launched Te Ahumoana a-mahi, said Maori were already extensively involved in the aquaculture industry through successful Maori-owned companies such as those in Marlborough and the Coromandel.

Fisheries Minister Jim Anderton shared a similar message with students at Queen Charlotte College in mid-May saying that environmentally sustainable aquaculture was already an important part of New Zealand's economy and was poised to grow significantly in the next 20 years.

The Government's learning resource follows the lead of schools like the college which set up its own aquaculture academy six years ago, with technical and financial help from industry and the Marlborough District Council.

The college now has its own barge and mussel line in the inner harbour, with students able to conduct experiments such as painting panels with different types of antifoul, suspending them at different depths, then diving and using underwater photography to compare results.

The learning resource is available at: www.aquaculture.govt.nz.

Central Government Roundup

Proposed New Zealand Coastal Policy Statement 2008

The Board of Inquiry on the Proposed New Zealand Coastal Policy Statement (NZCPS) 2008 has received more than 500 submissions on the document, according to the Department of Conservation. The Board, chaired by Alternate Environment Judge Shonagh Kenderdine, notified the statement on 8 March, with a call for submissions by 7 May. With 538 submissions received, some 270 submitters have indicated a wish to be heard by the Board. Hearings are yet to be scheduled. Opus International has been contracted to prepare a summary of submissions.

The Proposed NZCPS 2008 resulted from a review of the existing NZCPS, which has been in effect since 1994. The proposed NZCPS 2008 includes objectives and policies for sustainable management of New Zealand's coastal environment. Regional and Territorial councils must give effect to these objectives and policies through rules or other methods in their plans. The proposed NZCPS 2008 identifies restricted coastal activities, for which the Minister of Conservation will decide applications for resource consent. It addresses (amongst other things),

- Treaty of Waitangi and tangata whenua matters;
- subdivision, use, and development;
- coastal occupation charging;
- natural character, biodiversity and landscapes;
- public access;
- water quality;
- coastal hazards; and
- historic heritage.

Foreshore and Seabed Act Negotiations

The foreshore and seabed issue arose in June 2003 when the Court of Appeal found that previous legislative attempts to provide for Crown ownership of the foreshore and seabed did not necessarily extinguish customary rights or title. This meant that the Maori Land Court had the jurisdiction to investigate claims to the foreshore and seabed.

The Foreshore and Seabed Act was enacted in November 2004. It vested the public foreshore and seabed in the Crown (New Zealand Government). It also provided for the Attorney-General and the Minister of Maori Affairs to enter into an agreement with a group to recognise that, but for the vesting of ownership of the public foreshore and seabed in the Crown, that group or members of the group, would have had a claim for territorial customary rights over a specific area of the public foreshore and seabed.

The Crown is currently in negotiations on foreshore and seabed agreements with four groups – the hapu of Te Whanau a Apanui, certain hapu of Ngati Porou, Ngati Porou ki Hauraki and Ngati Pahauwera.

In February 2008, the negotiating representatives for the hapu of Te Whanau a Apanui and the negotiating representatives for certain hapu of Ngati Porou signed separate Heads of Agreement with the Crown. These included draft Deeds of Agreement which outline the nature, scope and extent of the instruments to be provided to the hapu who choose to ratify the finalised Deed of Agreement. These instruments fall into two categories. They may apply either to the entire area that will be covered by the finalised Deed of Agreement, or only in territorial customary rights areas. Table 1 gives a brief description of these instruments.

The Crown and the hapu are discussing the location of the territorial customary rights areas. Once these are agreed and the Deeds of Agreement have been ratified by the Crown and the hapu, the High Court will need to confirm that the statutory requirements for territorial customary rights areas have been satisfied. Legislation will also be required to give effect to the Deeds of Agreement once the territorial customary rights areas have been confirmed by the High Court.

Negotiations with Ngati Porou ki Hauraki have been ongoing since 2005 and relate to two areas on the Coromandel Peninsula, at Kennedy Bay and Mataora Bay. A significant amount of work has to be completed before the negotiating parties will be able to agree which areas within the rohe

Seeking Contributions to *Coastal News*

Your contributions to *Coastal News* are welcome. These contributions are important to keep NZCS members informed about coastal issues in New Zealand and around the world. Contributions may be in the form of advertisements, notification about conferences or workshops, short news items, or longer articles of 400-800 words plus photos or diagrams.

For further information or to submit an idea please contact Alex Eagles, Editor *Coastal News*, on penguins@clear.net.nz.

Instruments that apply to the whole of the rohe moana	
Statutory Overlay	Records that relevant hapū have mana over the relevant area and assists with effective participation by the hapū in resource consent and marine reserve processes.
Environmental Covenant	A statement that will contain issues, objectives, policies and rules or other methods of the hapū in relation to: • the promotion of the sustainable management of the natural and physical resources in the rohe of the hapū; and • the protection of the cultural and spiritual identity of the hapū. District and regional plans and policy statements will need to take the Environmental Covenant into account.
Protected customary activities	Provides protections for customary activities, uses and practices consistent with the customary rights orders provisions in the Foreshore and Seabed Act 2004.
Waahi tapu	Access to identified Wāhi Tapu areas will be restricted or prohibited. Local authorities will be required to take any reasonable action necessary to implement the access restrictions or prohibitions, for example, by erecting signs and fences.
Relationship instrument	Facilitates regular interaction between key Ministers, departments and relevant hapū.
Fisheries mechanism	Creates a set of customary fishing regulations which provide for the establishment of a specific customary fishing management regime across the agreement area.
Place names	Provides for places of cultural significance to hapū to have the names for those places officially recognised.
Pouwhenua	Provides for hapū to erect pouwhenua/signage at sites of cultural significance.
Instruments that apply only in territorial customary rights areas.	
Permission right	Gives hapū the right to give, or refuse their permission to: • certain resource consent applications in the coastal marine area (including aquaculture activities in Aquaculture Management Area); • plan change requests to establish an Aquaculture Management Area under the Invited Private Plan Change process; and • applications for a marine reserve.
Extended Fisheries Mechanism	Provides hapū with the ability to make by-laws under customary fishing regulations. These by-laws may place restrictions of fishing, either to preserve sustainability or for cultural reasons such as a following a death by drowning in the area.
Extended Environmental Covenant	Provides hapū with the ability to ensure all statutory plans that cover a territorial customary rights area recognise and provide for the approach of the hapū to the sustainable management of physical and natural resources in the area.

Table 1: nature, scope and extent of the instruments to be provided to the hapu who choose to ratify the finalised Deed of Agreement.

of Ngati Porou ki Hauraki meet the criteria for territorial customary rights recognition as outlined in the Foreshore and Seabed Act.

Ngati Pahauwera are a confederation of hapu centred around the Mohaka River in the northern Hawke's Bay. Ngati Pahauwera and the Crown will be negotiating the first combined historical Treaty settlement and foreshore and seabed agreement. This negotiation is at an early stage and is currently focussed on research and identifying respective interests, which will be progressed in consultation within the iwi and with neighbouring groups.

For more information, go to www.justice.govt.nz

Ministry of Fisheries Update

Fisheries Plans

New Zealanders fish for recreation, custom, tradition, and for a living, and many businesses and communities rely on fish and the marine environment. The Fisheries Act splits these users into three main groups; Maori customary non commercial, recreational and commercial. In addition, environmental groups bring additional interests to fishery management. These different sectors want different outcomes from their fisheries and fisheries management. Fisheries Plans are being used to identify and then balance these interests in order to provide the best value from our fisheries.

A key tenant of the process is that fisheries plans will be developed in collaboration with tangata whenua and stakeholders. Fisheries plans will describe how New Zealanders can get best value from their fisheries, within environmental limits, or standards, set by the Government. Fisheries plans will allow us to:

- Specify government-set standards within which fisheries should be managed.
- Identify the value different stakeholders obtain from the fishery.
- Set objectives for a fishery to get best value.
- Design the management of the fishery to achieve the objectives.
- Make fisheries management more transparent.

Fisheries plans will allow us to improve the way we prioritise use of Ministry resources and provide a clearer basis for monitoring performance of each fishery.

The following fisheries plans are under development: Challenger Finfish, Foveaux Strait Oyster, Highly Migratory Species, Northland Scallops, Paua (PAU 5), Rock Lobster (Cray 3), Southern Shellfish, Westcoast North Island Finfish.

More information about fisheries plans can be found at: http://fpcs.fish.govt.nz.

MPA Policy – biodiversity protection

New Zealand has a rich and complex marine biodiversity. Due to its isolation, the New Zealand marine ecosystem has a high level of endemism. In order to protect this unique biodiversity, the New Zealand government has a target of protecting 10% of the sea area by 2010.

The Marine Protected Areas Policy and the new Marine Protected Areas Protection Standard and Classification System put in place an integrated and structured process for the identification of marine protected areas and for the identification and implementation of mechanisms to achieve the appropriate level of protection.

Coastal waters to 12 nautical miles are being addressed on a biogeographic region basis whereas the area from 12 nautical miles to the outer limit of the EEZ will be addressed at a national level. Biodiversity protection in these offshore areas will be addressed after 2012.

The task of identifying possible MPAs and their protection mechanisms will be undertaken by a Marine Protection Planning Forum (MPFF). It is intended that MPFFs are comprised of representatives of tangata whenua, relevant marine user groups and environmental interests. In proposing areas, the Forum must seek to achieve New Zealand biodiversity outcomes whilst minimising the impacts of proposals on existing users and on Treaty settlement obligations.

For more information please go to:

www.fish.govt.nz/en-nz/Environmental/Seabed+Protection+and+Research/MPA

www.doc.govt.nz/templates/summary.aspx?id=33756

http://www.biodiversity.govt.nz/seas/biodiversity/protected/index.html

Sandy Bits

Saving Hong Kong's Marine Life...

Hong Kong's waters were once abundant with marine life, including 80 species of hard coral and around 1,000 species of fish including sharks, manta rays and green turtles. But today this once magnificent marine environment is suffering from pollution, development and overfishing. Things have got so bad that certain species are now heading towards extinction and the average weight of a local fish caught from trawling today is less than 10 grams!

Hong Kong is one of the most intensively fished places in the world with some areas being trawled with heavy weighted nets several times a day. As a result of uncontrolled fishing, populations of many species have crashed under a barrage of threats. WWF believes the solution is to identify protection zones, which would enable marine life to survive undisturbed and thrive again. (www.worldwildlife.org).

And Saving Our Dolphins

The New Zealand Government recently announced a package of measures to protect the Hector and Maui dolphins. These measures included four new marine mammal sanctuaries as well as extending the sanctuary off Banks Peninsula, regional bans on set net fishing, sand mining and mineral extraction, restrictions on trawling and an extra $6 million over the next three years to pay for observers on all commercial fishing vessels operating where the dolphins live. (www.forestandbird.org.nz)

University News

Victoria University of Wellington

Te Whare Wananga o te Upoko o te Ika a Maui.
School of Geography Environment & Earth Sciences

The causes and impacts of climate change and associated sea-level rise is a major foci of coastal research at Victoria University. The effects of human-induced global warming on vulnerable coastal environments is one of the major environmental threats of today, and research at Victoria is focussed on its impact on the coast of New Zealand and Pacific island nations. In addition to climate change, research is also being conducted on the dynamics and morphology of rocky coasts, sandy beach and barrier evolution, infill histories of estuaries and coral reef dynamics.

Coral Reefs

The people of the Pacific are some of the most vulnerable to sea-level rise, with predictions of the drowning of entire atolls sending environmental refugees around the world. How sand islands respond to changing sea levels is one of the Victoria research themes, combined with the environmental sustainability of the landscapes of reefs and their associated sandy and high islands. Field sites in Fiji and Palmyra Atoll are actively being studied and on Niue, Helene

Figure 1: Surveying on Farewell Spit. Some projections of climate change suggest that such landforms may be completely destroyed as the sea rises.

Figure 2: Surveying beach change on the 300-level field trip to Napier.

figure 3: Grab sampling sediment around Lord Howe Island. Coral reef at this location may hold the key to unravelling how reefs respond to warmer climates.

Marsters, is investigating sediment accumulation as part of her masters project. Reefs in the Tasman Sea are also being investigated, especially those found at the southern limit of reef development around Lord Howe Island.

NZ Coast

A number of projects are also being conducted on the New Zealand coast looking at aspects of erosion and coastal landform response to changing wave and sediment supply conditions. Masters student Helli Tribe is currently finishing her thesis on the impacts of projected sea-level rise on Farewell Spit, while Dave Olson is looking at beach change around Wellington Harbour.

Recently completed projects have looked at estuarine infill in NW Nelson and the evolution of the Kapiti coastal plain over the last few sea level cycles. I have also been looking at the dynamics of rocky coast evolution in along the Otago and Wellington coastlines.

In addition to this research activity, coastal aspects are taught in a range of courses in undergraduate and graduate level. These include field trips to the gravel beaches of Hawke's Bay and around Wellington, to Turakirae Head and Makara. At graduate level students also visit the key landform sites along the east coast of the South Island, including Kaikoura and Otago.

Please feel free to contact me (David.Kennedy@vuw.ac.nz) if you would like any further information or visit the Victoria University website (www.vuw.ac.nz).

News from the Regions

Hawke's Bay Region News

Neil Daykin, Hawke's Bay Regional Coordinator

Oil Spill Exercise

The Hawke's Bay Oil Spill Response team were involved in a major offshore spill exercise based at Cape Kidnappers on 22 April 2008. The exercise focused on aerial operations, working with the tides to get access to 'affected' beaches, protection of wildlife and establishing effective communications between those working remotely on the beaches under the Cape and the Emergency Operations Centre. Over 50 staff were involved including those from the Hawke's Bay Regional Council (HBRC), Hawke's Bay Volunteer Coastguard, Department of Conservation, Massey University and Maritime New Zealand. The exercise had a realistic scenario and operations focused in different areas from previous exercises. Observers commented there were good regular briefings and the team worked really well together, which will put the team in a good place for any real oil spills in the future.

Dunes

The Waimarama beach society will be planting 2800 spinifex on 25th May. The society works closely with Hastings District Council and HBRC.

Coastal Protection

Napier City Council are currently proposing to extend an existing breakwater at Whakarire Avenue, Westshore, Napier to provide erosion protection and create a pocket recreational beach. NCC are currently preparing consent applications for their proposal.

Coastal Erosion Part 1

What a difference a few days makes at Clifton Motor Camp, south of Napier near Cape Kidnappers. Two swell events this month (5th & 23-26th May) have produced significant erosion in the Hawke's Bay Region, especially noticeable in the proximity of coastal property. The first photo shows damage from the 5th May swell event, with the second photo showing further damage after the 23-26th May swell event. Although swell sizes from the 5th May event were not huge (<1-1.5m), these were combined with very high spring tides and did significant damage, blowing out the end of an old sea defence and cutting back the bank some 2-5m in places. The 23-26th May event had larger swells (1-1.5m) and neap tides, but a further 2-4m of bank was lost in places. Fortunately, no major damage to caravans and associated structures was sustained in the late May event as HBRC had provided 4 days advance warning of the swell.

Coastal Erosion Part 2

And how about: what a difference a few months makes at Haumoana, south of Napier. A swell event in February 08 and then two swell events this month as above (5th & 23-26th May 08) have taken their toll on one particular property. The Jan 08 photo (taken 30/05/06) represents how the "intact" timber sea wall, with a large deck behind looked like in January. The two February photos show damage following the February swell event. The April photo (taken 20/05/08) shows a "nicely" rebuilt timber sea wall, but minus the deck and the hole behind the seawall was in filled with shingle prior to the 23-25th May swell event. The last two photos taken on 26th May show the damage caused by 3 preceding days of heavy seas (23-25th May). The family living in this property self evacuated during the swell event.

Residents declare war on aggies at Mangakuri Beach

Mangakuri with its small number of holiday

batches and just three permanent homes is one of Hawke's Bay's iconic rural beach settlements. The close-knit community is known to be very proactive with issues relating to the health of their beach. In 2000 the community approached HBRC and were given assistance to control an infestation of Cape Ivy and fence the foredunes to prevent vehicle damage.

Earlier this year Mangakuri residents decided to do something about the marram grass and some of the other 'garden escapees' like exotics such as agapanthus, nasturtium, echium and cotyledon

that have established on the beach. HBRC are providing assistance through the Regional Landcare Scheme and are helping to design a weed control programme that will allow residents to carry out the work themselves. In March 08, initial spraying and seed head removal was carried out, with a follow up planned for spring. The community hopes that once agapanthus and other invasive weeds are under control they can shift their focus from weed control to restoring native dune plants.

HBRC trial spinifex on gravel beaches

With growing interest in dune restoration, HBRC land management team decided to find out whether native spinifex would grow and survive on the region's gravel beaches. Two rabbit-proof plots were established on a gravel beach and spinifex seedlings planted as they would be in a dune planting project. Results have been encouraging with the majority of seedlings surviving their first year. Seedlings in one of the plots have shown growth rate that would match that of plants grown on straight sand, although the runners do seem to struggle to anchor without sand. While it remains to be seen whether the plants will spread naturally, or trap wind-blown sand as they would on a sandy beach, the fact that they have grown as well as they have has excited staff involved with dune restoration. There may be an opportunity to use spinifex in soft-engineering options for beach protection work, perhaps as part of a beach re-nourishment programme.

NZ Coastal Society Survey 2007

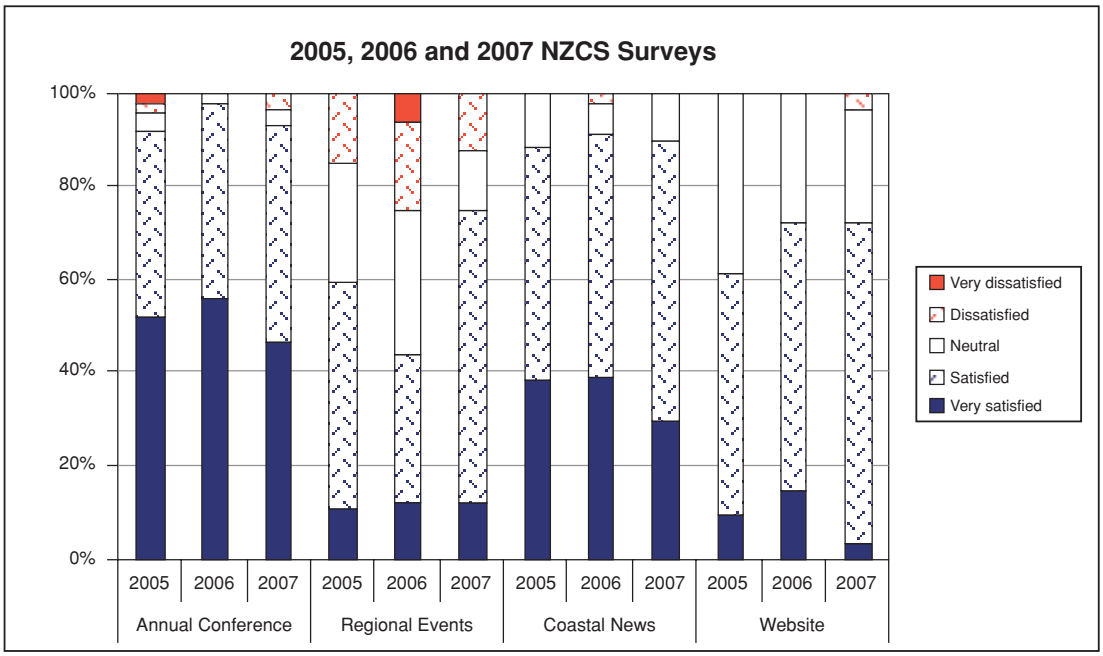
Satisfaction levels remain high but show areas for improvement

Congratulations to Valerie Cole of Auckland, the lucky winner of the $50 book voucher prize for returning the annual NZ Coastal Society (NZCS) services survey in December 2007. The NZCS management committee also thank all the other survey respondents. Your feedback will be used to improve membership services.

The results of the survey show that satisfaction with the annual conference and *Coastal News* continues to remain very high (see figure below). Satisfaction with regional events and the website is lower, again a similar result to previous years. The committee considered these results at their last meeting and this year will be focusing on improvements to the website and on giving more assistance with holding regional events.

The NZCS e-mail digest was introduced in 2007 and the survey was a good opportunity to get some feedback on that new service. Fifty-six percent of respondents said they 'always or often' read the digest, 31% read it 'sometimes' and 13% never read it. The committee consider that this is a good level of use, but will be trying to address the feedback that the e-mails do not have enough content and that the items have sometimes been repetitive. All members are encouraged to use the digest to send appropriate and relevant announcements, information and job vacancies to the NZCS membership. Information on how to get items included in the digest is available on the NZCS website (www.coastalsociety.org.nz).

The survey forms were distributed to all attendees at the NZCS conference in Tauranga and also sent out to all members with *Coastal News*. A total of 34 forms were received. A full report on the survey results is available on the NZCS website.



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 homepage (www.coastalsociety.org.nz/Corporate.htm)
- Website listing of services provided by corporate organisation, contact details, and links to recent projects or corporate organisation 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 – March, June and November.
- Discounted registration at member rates for the corporate contact to all NZCS Conferences.
- Short feature on a Corporate Member in *Coastal News*.

For more information on Corporate memberships please contact:

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

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

Corporate Member: Environment Bay of Plenty

Environment Bay of Plenty is the regional council for the Bay of Plenty region. The mission statement is Working with our communities for a better environment - Me mahi ngatahi tatau katoa, e ora rawa atu ai to tatou taiao. The Bay of Plenty coastal environment is one of the most significant resources of the region. The total coastal perimeter of the region from Waihi Beach to the East Cape is 688 km, with 259 km of open coast.

A few examples of what we do:

Environment Bay of Plenty monitors sea temperature and wave climate in real time 13 km offshore in the central Bay of Plenty through its wave buoy at Pukehina.

Environment Bay of Plenty has recently completed coastal strategies for Ohiwa Harbour and Tauranga Harbour, and is currently developing one for the lower Kaituna River and Maketu Estuary. These strategies have been collaborative efforts with councils, tangata whenua and local communities.

Community led initiatives include the Coast Care and Estuary Care programmes which are run by volunteer care groups.

Further details on the above and other coastal work is available under the coast pages of our website at www.envbop.govt.nz.