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## Artificial Reefs Offer Coastal Protection



*An artificial reef is scheduled to be built at Mount Maunganui this year to enhance the already popular surf*

Photo courtesy of Tauranga City Council

*Love them or hate them artificial reefs are beginning to make waves in the area of coastal management in New Zealand and around the world as Shaw Meads of ASR Ltd explains.*

The Artificial Reefs Program's (ARP) research into offshore coastal protection has come a long way since its inception in 1995. The progression from the preliminary research into the various concepts that comprise multi-purpose reefs, through to the present worldwide projects and re-direction to this form of management for exposed coasts has been extremely rapid. During the last 10 years a transition in attitudes has occurred from disbelief to common acceptance and there is now a general understanding of the fact that "if you block the waves on a reef offshore, the beach will be protected". Indeed, there is an increasing number of reef initiatives proceeding around the world including Europe, USA, South America as well as Australasia.

From a basic point of view, it's not new technology; the undergraduate's coastal oceanography 'bible', "Beach Processes and Sedimentation", describes the use of submerged reefs early in the 20th century, and the Japanese have been using simple submerged structures for coastal protection for over 20 years. Just as groyne have been described as 'mimicking' the headlands between beaches, submerged reefs that protect the coast are found wherever the

geology and the wave climate is conducive, on a variety of scales. However, things have progressed significantly in the past decade, especially in the area of functional design.

Ongoing research on artificial reefs has led to new understanding of local influences of submerged reefs in many aspects of coastal processes. Advances in design, from the redirection of waves to control coastal erosion when it is not possible to break them on the reef, to ensuring that each section of the waves that break on a reef optimize the surfing experience, are now possible. And the research is continuing, not only here in New Zealand, but worldwide.

Aspects such as how to optimize the coastal protection by the distance a structure is placed offshore in comparison to its along-shore dimensions; the maximum tolerances that can be constructed without distorting waves; and fabrication of custom made sand-filled containers are all currently being investigated.

ASR Ltd is currently investigating the impacts on wave energy transmission with respect to the combination of reef slope, crest width and crest depth. ASR Ltd is also carrying out research into amalgamating the design shapes with the engineering and materials restrictions, and fine-tuning the inshore ends of reefs that incorporate surfing amenity to ensure that the wave breaks with a form that allows surfers to exit from the



Figure 2: Simple submerged reefs used for coastal protection in Japan. The similarity with the St Claire, Dunedin, situation is striking - with a thorough understanding of the site and incorporation of surfing amenity to mitigate where it already exists, submerged reefs could be a viable option to retain beach sand at the western end of St Claire.

'tube' without getting 'pinched' when the swell's conducive to the generation high-quality surfing waves.

One of the driving influences behind the increasing interest and usage of multi-purpose submerged reefs for coastal protection is the large socio-economic value that wide sandy beaches provide. The value of the coast is now starting to be realized in a far broader sense than it has been in the past, and ways of considering the 'Total Economic Value' of beaches are being developed. A very good case study of a successful multi-purpose reef is the Narrowneck reef on Queensland's Gold Coast.

The Gold Coast is Australia's primary tourist destination, with its wide sandy beaches being a major attraction. The erosion problem on the

Gold Coast was confined to a hotspot at Narrowneck, where only the coastal road separates the Broadwater from the sea. This causeway was breached several times in the previous century and coastal protection was proposed as part of the Gold Coast Beach Protection Strategy to address this problem. The Gold Coast has a predominant southeasterly swell direction, which results in large net sediment transport in one direction (~500,000 m<sup>3</sup>/yr to the north), although reversals of sediment transport direction occur frequently.

Traditional coastal protection methods were considered (e.g. groynes, tipped rock revetments, etc.), however, a socio-economic assessment found that for every dollar spent on enhancing the beach, \$60-80 was returned via tourism. Consequently, an offshore-

submerged reef was proposed and design works were undertaken. The aims of the project were (a) to widen the beach and dunes along Surfers Paradise Esplanade; and (b) to improve the surfing climate at Narrowneck.

A comprehensive field program was undertaken, with the results being utilised for reef design and sediment transport modelling (i.e. to assess the functional performance of the reef). The resulting final design was a 120,000 m<sup>3</sup> submerged reef. The Narrowneck submerged reef has been hugely successful at retaining sand nourishment material pumped onto Surfer's Paradise Beach from the Broadwater. Argus coastal imaging has shown that wave energy is dissipated by the reef for up to 90% of the time and that Narrowneck reef is an erosion control point on the coast.



0.1 km

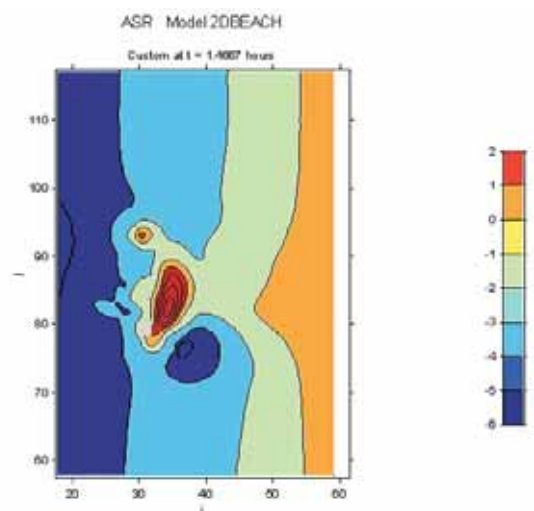
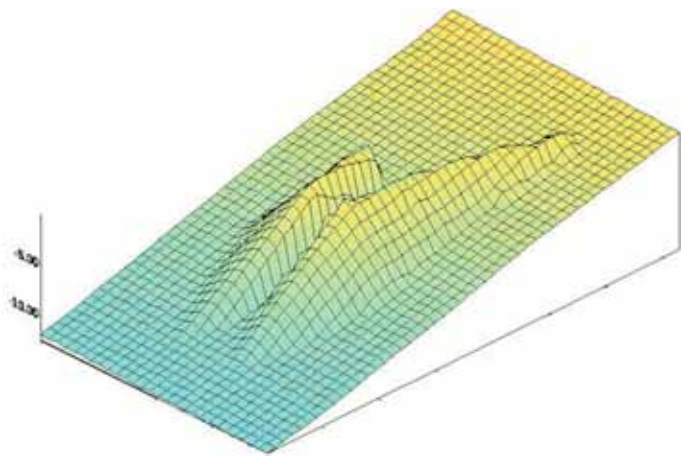


Figure 3: Natural coastal protection (a salient) formation in the lee of a submerged reef at Opito Bay, Coromandel (left). Sediment evolution modelling was used to simulate the formation of the salient at Opito Bay. RTK surveys of the bathymetry and beach were used to first calibrate and then verify the modelling (right).





**Narrowneck Reef Design**



Figure 4: 3-dimensional representation of the Narrowneck multi-purpose reef design (top). A view of Surfers Paradise with the multi-purpose reef in the foreground (bottom).

The Gold Coast reef has been a huge success, not only in terms of coastal protection, but also providing a surfing facility (recent reports describe the reef as the 'best surfing spot on the coast') and a 'natural' reef ecosystem that supports a dive trail. An important outcome of the project was the confirmation (via beach profile monitoring and Argus coastal imaging) of no downdrift impacts on the coast.

In 2000, the Narrowneck reef project won the prestigious Queensland State environmental award. Recent re-assessment of the economic impacts of the reef has confirmed a benefit:cost ratio of 70:1. The numerical model simulations have recently been confirmed by the on-going monitoring of the reef, which shows that the extent of the salient created by the Narrowneck reef is very similar to what was predicted.

Construction of New Zealand's first multi-purpose reef at Mount Maunganui is due to commence

in 2005. A comprehensive monitoring programme will be undertaken in conjunction with a local tertiary institute.

For further information contact Shaw Mead (s.mead@asrltd.co.nz) or Kerry Black, ASR Ltd, PO Box 67, Raglan.



Figure 5: The Narrowneck multi-purpose reef. Clockwise from top left, colonization of the reef has resulted in a dive-trail; before and after reef construction (construction commenced in August 1999); surfing on the reef; and the view from the surf.



## Editorial

At 00:59 GMT 26 December 2004 the world was shaken in more ways than one when an earthquake, magnitude 9 on the Richter scale, occurred of northern Sumatra. Although the quake itself, the fifth largest since 1900, did flatten buildings on the nearby island it was the resulting tsunami, which devastated areas of the Indian Ocean and the Andaman Sea sending shock waves around the world.

In fact, the resulting disaster is thought to be the greatest affecting coastal regions in recent history surpassing even the devastation of the 1971 Bangladesh cyclone that claimed over 140,000 lives.

Months later ripples are still being felt in political and coastal management/research circles around the world as the realization that such an event could happen to any coastline in the world came in the aftermath of the disaster.

Even in New Zealand the Boxing Day tsunami has brought data and tsunami anecdotes floating to the surface about our country's tidal wave history while local government is awash with tsunami reports for each coastal region.

Geological research using sediment sampling has found that since the signing of the Treaty of Waitangi New Zealand has experienced seven reasonable-sized tsunamis, as well as dozens of moderate tidal waves around the country.

The most recent fatal tsunami which occurred in the Chatham Islands on August 15, 1868 resulted in an entire village being destroyed.

In May of 1877 3.7 m waves were measured at Port Chalmers while 6 m waves pounded the Chatham Islands in July 1924.

Giant 15.3 m waves washed over the land in the Hawke's Bay during February 1931. Gisborne experienced two tsunami in the same year, when in March 1947 10 m waves wreaked havoc along the coast and then again in May where 6 m waves occurred along the eastern coast.

Around 7 pm on May 25 1960 tidal waves rising and falling up to 16 feet (4.9 m) lashed the eastern coast of New Zealand triggered by a magnitude 9.5 in Chile 12 hours earlier, the biggest quake since records began. One witness described waves rushing ashore at great speeds, up over the streets, tearing boats from their moorings and then receding so far that a 120-year-old shipwreck was exposed.

Although most of the tsunamis experienced along the New Zealand coast corresponded with seismic events off shore and overseas, tidal waves are not only created by earthquakes. In a report undertaken for

Environment Bay of Plenty and Environment Waikato, NIWA suggested the greatest risk to the Bay of Plenty was from tsunamis originating from events such as an eruption of Tuhua (Mayor Island) or activity in the Taupo Volcanic Zone. The resulting tidal waves could reach the coast in 30 to 60 minutes. In comparison tsunamis originating from further afield, such as a landslide in the underwater Hikurangi Trough 250 km to 300 km away, would take two to three hours to reach the coast.

It is understandable that the Sumatra tsunami is an event that some people will never forget. However, while local government civil emergency and coastal hazard management plans should sensibly take tsunami events into account, suggestions of putting signs on all New Zealand beaches telling people to look out for suspicious looking waves that may be tsunamis could be taking the matter one step too far.

The suggestion to relocate the New Zealand Parliament buildings in Wellington, back to the relatively quake free far north where they were originally founded 164 years ago could be food for thought, yet, I think the Beehive could be quite useful at deflecting a large wave.

Alex Eagles  
Coastal News Editor and  
NZCS Coordinator

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**...since the signing of the Treaty of Waitangi New Zealand has experienced seven reasonable-sized tsunamis, as well as dozens of moderate tidal waves around the country**

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The views expressed by the authors of articles published in *Coastal News* are not necessarily those of the New Zealand Coastal Society or the Institution of Professional Engineers New Zealand.

The *Coastal News* merely provides a forum for discussion. We appreciate all contributions and would like to thank all of the authors in this edition.

If you would like to contribute an article, news item or conference announcement to *Coastal News*, see the guide for contributors on page 16.



## 2005 NZCS Conference Keynote Speaker - Dr Robert Dean

Dr Robert Dean is past Chairman and now Professor Emeritus in the Coastal and Oceanographic Engineering Program, Civil and Coastal Engineering Department, University of Florida. His experience has provided him with a vast practical knowledge combined with an academic, technical and mathematical background through a Bachelor of Science degree (Civil Engineering) from the University of California (Berkeley), a Master of Science degree (Physical Oceanography) from Texas A&M University (College Station, Texas), and a Doctor of Science degree (Civil Engineering) from Massachusetts Institute of Technology (MIT).


Dr Dean has witnessed the evolution of coastal science during the last 38 years as he researched and taught subjects related to beach systems. He has held professorships at MIT, University of Washington, University of Delaware and the University of Florida and now has graduates all over the world. He worked as a senior research engineer for Chevron Research Corporation. In the mid 1980s, he was Director, of the Division of Beaches and Shores, Florida Department of Natural Resources, Tallahassee, Florida, responsible for the State of Florida beach program encompassing some 1,200 km of sandy beaches.

Dr Dean has co-authored the book "Coastal Processes With Engineering Applications" and has authored the book "Beach Nourishment: Theory and Practice". He was a member of the Coastal Engineering Research Board involved in the planning and review of the original U.S. Army Corp of Engineers "Shore Protection Manual". He has published over 200 technical papers and consulted with approximately 100 firms and governmental agencies in the general area of coastal and ocean engineering.


Robert Dean's engineering and scientific studies have been conducted both in the United States and internationally, including New Zealand when he spent a portion of a Sabbatical at Waikato University in early 1991. In 1994, he audited the "Mangawhai Harbour Restoration Plan". In 2004 and 2005, he presented expert evidence evaluating the effects of sand extraction from the entrance to Mangawhai Inlet and the entire Mangawhai-Pakiri embayment.

Dr Dean's special interests are in the areas of shoreline changes, effects of inlets, sea level rise, and beach nourishment. His distinguished career in academia and consulting has made a profound impact on the field of coastal engineering.


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Whangarei Coastal Management Strategy

# Prediction Of Contaminant Buildup In Estuaries To Support Urban Planning

*Modelling the effect of contaminants in estuaries can help to indicate the impact of urban stormwater runoff on our harbours as Malcolm Green and Mike Timperley of NIWA explain.*

Estuaries downstream of urbanised catchments accumulate contaminants (e.g., zinc, copper, polyaromatic hydrocarbons [PAHs]), and these can build to toxic levels. To plan catchment development that also achieves environmental goals in the estuary, we need to be able to predict rates and locations of contaminant accumulation on the timescale of decades, which is the relevant timeframe for planning. Using numerical estuary models it is possible to predict the dispersal of freshwater / sediments / contaminants discharged from streams and stormwater overflows during rainstorms. But, such models cannot be used in any direct way to make predictions on the planning timescale.

The USC-2 (Urban Stormwater Contaminant) model has been developed to make long-term predictions of contaminant accumulation in estuaries. Accumulation is treated as the result of many injections and dispersals at the scale of the individual rainstorm, combined with other processes such as bioturbation and physical mixing by waves and currents that occur between rainstorms. At the heart of the model is a set of mass-balance equations that describe generation and fate of contaminants and sediments in the system at hand. Sediments need to be addressed in the model because these carry much of the contaminant load, and because they also ultimately dilute contaminants in the estuary bed sediments. The set of mass-balance equations is established through analysis with three “core” models: (1) GLEAMS (catchment sediment erosion / transport model); (2) NIWA STORMQUAL (contaminant generation based on housing, commercial activities and traffic); and (3) MIKE 3 (estuary hydrodynamics and sediment-transport model). The USC-2 model is driven by a future rainstorm series that is either constructed randomly (e.g. by a Monte Carlo process) or that can be biased to represent worst-case or best-case outcomes.

The USC-2 model has been applied to identify the level of development and controls necessary to secure the long-term protection of the Upper Waitemata Harbour (UWH). Buildup of zinc, copper and PAHs in the bed sediments of 11 “subestuaries” of the harbour under a number of scenarios has been predicted. The “Existing” scenario provides baseline information against which future trends can be compared. The “Development #1” scenario is one possible way that is being considered for catchment development over the next 50 years, which includes a certain level of stormwater treatment.

Figure 1 shows an example of predicted PAH concentrations in the surface sediments of the middle main body of the harbour. PAHs are predicted to exceed the Environmental Response Criteria “red traffic light” sediment-quality guideline within the next ~30 years under Development #1, which indicates probable biological impacts. The curve is bracketed by two other curves, one showing PAH buildup under the Development #1 pattern and intensity of urban development but with maximum-attainable stormwater treatment (which may come at considerable cost), and the other is zero stormwater treatment (which demonstrates the environmental gains made by the level of stormwater treatment already within the Development #1 scenario). A considerable gain in “time to traffic-light exceedance” (~15 years) is won by improved stormwater treatment, which might justify the extra expense, given that new technologies for mitigating or avoiding contamination could emerge in that time.

It is worth noting that this is not true of every subestuary in the UWH. In some parts, the shift to maximum stormwater treatment on the land gains virtually nothing in the estuary, and in others a very small improvement in treatment is predicted to avoid guideline exceedance entirely. The difference lies in the complex connections between the various sensitive parts of the estuary and the various contaminant hotspots in the catchment, which is precisely what the model is intended to capture. These connections can be summarized in “circle diagrams” of the type shown in Figure 2.

The circle diagrams can be examined to develop broad strategies for attaining environmental goals. For instance, Figure 2 shows that the largest supplier of zinc to the middle main body of the harbour is the Lucas subcatchment. This suggests that intervention in that subcatchment would lead to benefits in the middle harbour. However, Lucas subcatchment also supplies a significant load of sediment to that part of the harbour, which is beneficial in terms of contaminant buildup (it

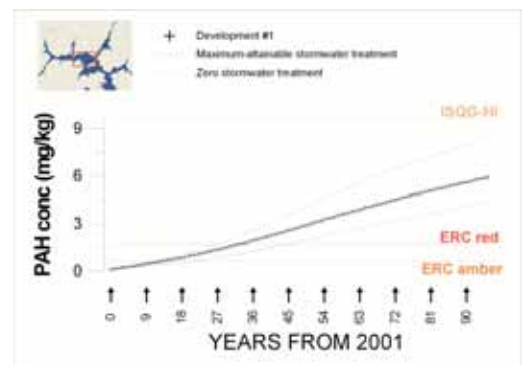


Figure 1: Predicted PAH concentrations in the surface sediments of the main body of the harbour.



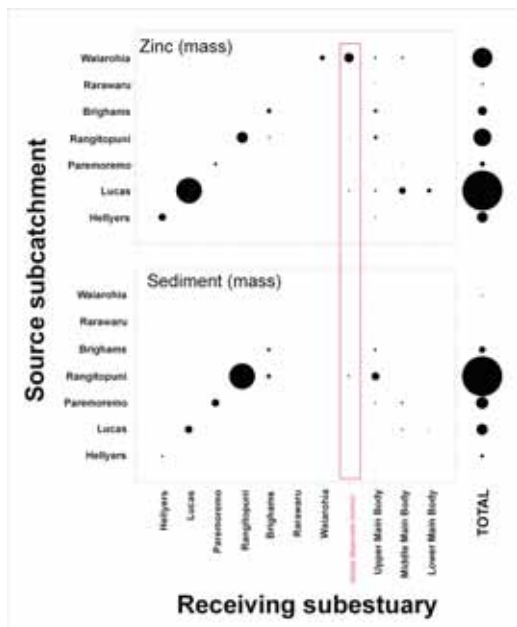


Figure 2: "Circle diagrams", for zinc and sediment. (1) Reading across each line indicates where zinc/sediment generated in each subcatchment ends up in the harbour. For example, most of the zinc generated in Lucas subcatchment ends up in the Lucas subestuary (tidal creek). (2) Reading up each column indicates zinc/sediment deposited in each part of the harbour comes from. For example, most of the sediment deposited in the upper main body comes from the Rangitopuni subcatchment, but zinc comes from a wide range of sources.

dilutes contaminant concentrations). This leads to a tricky problem: improving stormwater treatment, which removes both suspended fine sediment and contaminants, may actually accelerate the rise of contaminant concentrations. So, although broad strategies can be identified from the circle diagrams, the detailed outcomes of intervention – which may seem counterintuitive – still need to be investigated by running the USC-2 model.

The way forward, then, is to run the model in a kind of iteration, with discussion of results after each loop, until an acceptable – and no doubt compromise – development strategy can be found. As part of this iteration in the Upper Waitemata

study, it has been found that stormwater treatment alone may not deliver acceptable environmental outcomes in some critical parts of the harbour, which has turned attention to benefits that could be derived by new methods of source control, such as regulating galvanised building materials. By linking "planning cause" to "environmental effect", the USC-2 model is providing the information needed to develop and defend regional planning policies aimed at protecting estuarine receiving waters in developing catchments.

The work has been funded by the Auckland Regional Council, Transit NZ, North Shore City Council, Waitakere City Council, Rodney District Council and the Foundation for Research Science and Technology (Sustainability of Aquatic Ecosystems and Water Resources, C01X0215; Effects-Based Protection and Management of Aquatic Ecosystems, C01X0307).

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## What's Hot On The Web

### Artificial Surf Reef Consultants

[www.asrltd.co.nz](http://www.asrltd.co.nz)

ASR is a Marine and Freshwater Consultancy specialising in Artificial Surfing Reef design. ASR provide innovative solutions to match modern environmental awareness through computer modelling and modern instruments. Projects that ASR have been or are currently involved with include: aquaculture development in Lombok, Indonesia; coastal processes and erosion protection of the Westshore Beach in Napier; iron sand mining in southern India; larval whiting dispersal in south-eastern Australia; beach erosion solutions for Noosa, Australia; the Whakatane marina ecological assessment; the New Plymouth foreshore redevelopment design sewage outfall modelling Port Phillip Bay, Australia; development of a district coastal management plan, southern India; and surfing reef feasibility studies in Lyall Bay, Opunake, Newquay in the UK, the Gold Coast, Mount Maunganui, and Bournemouth.

### Ocean Science

[www.ocean-science.net](http://www.ocean-science.net)

Ocean Science is a new online, open-access international scientific journal, published by the European Geosciences Union, dedicated to the publication and discussion of research articles, news and paper reviews covering all aspects of the ocean, its physics, biology and chemistry, and its interactions with the atmosphere above and the sediments below.

This journal is not fully peer-reviewed, but it is designed to allow an interactive public discussion of the latest developments in the field. Publication is paid for by a small service charge with no extra cost for colour or additional material such as movies. Papers are published with a Creative Commons licence, which allows any number of electronic and paper copies to be made for non-commercial purposes. The authors and their employers retain copyright.

*continued on page 13*



# Auckland's Sand Sources Under Close Scrutiny

## Coastal News



*Although sand is a highly sought after natural resource sand extraction may have a greater environmental impact than expected as **Andrew Benson** of ARC discovers.*

Construction for housing, industrial development and infrastructure to support growth ensures a continuing demand for mineral resources, namely sand and aggregates, the basic building material of all communities. In Auckland the demand for sand is ongoing and a continuous supply is vital to the regional economy. Whilst demand continues, resources in the Auckland region are limited.

The coastal environment has long been a source of sand for the Auckland region, which has few rivers and, therefore, a meagre supply of sand from alluvial sources. In-addition coastal sand has a number of desirable characteristics – is naturally well graded with a near ideal particle size distribution for concrete manufacture; sediment bodies are vast, therefore, sites last for many years; little post processing (additional cost) is required; and, sites are general accessible.

The supply of sand is currently sourced from the Mangawhai – Pakiri embayment (east coast) and the Kaipara Harbour inlet (west coast). In 1994 the Minister of Conservation granted 3 coastal permits for the extraction of sand from the nearshore of the Mangawhai – Pakiri embayment, and 2 for the extraction from the inlet and ebb tidal delta of the Mangawhai Harbour. In 1997 the Minister granted 2 permits to extract sand from the Kaipara Harbour inlet.

Concern about the actual and potential adverse environmental consequences of extraction from the coastal marine area, and in particular from the nearshore zone, have long been held. The major reasons that nearshore sand extraction has continued has been the lack of alternative sources that can be exploited with existing plant, and the difficulty in determining the issue of sustainability,

and in particular being able to distinguish the extent to which observed erosion of the shore can be attributed to extraction activities rather than to natural processes.

The permits granted by the Minister required a comprehensive study of the sustainable level of sand extraction, and gave rise to two comprehensive studies – the Mangawhai – Pakiri Sand Study and the Kaipara Sand Study.

Both studies were controlled by a group composed of representatives of the Regional Councils, the Department of Conservation, Tangata Whenua, and the sand extraction companies. The group was formed to define the parameters of the study, engage technical experts (both studies were headed by the National Institute of Water and Atmospheric Research (NIWA)) to undertake the studies, to oversee the studies, and to report to the Auckland and Northland Regional Councils.

Notwithstanding the use of the best available technology and expertise in coastal science, the outcomes of the Mangawhai - Pakiri Study did not provide absolute certainty, whilst the Kaipara Sand Study indicates that there are relatively few constraints to further sand extraction activities.

Subsequent to the completion of the studies, and lapsing of the permits for east coast sand extraction activities, new coastal permit applications have been made.

The Minister has considered and declined 2 applications to extract sand from the Mangawhai Harbour inlet and ebb tidal delta. Hearings for 2 applications to extract sand from the Mangawhai – Pakiri embayment commence 9 February 2005.

It has been recommended to the hearing committee that they recommend to the Minister that both applications be declined.

*Andrew Benson, Coastal Project Leader,  
Auckland Regional Council  
andrew.benson@arc.govt.nz*



## NZCS Management Committee

Chairperson	Lucy Brake (lbrake@beca.co.nz)
Deputy Chairperson/ Membership Coordinator	David Phizacklea (davidp@tauranga.govt.nz)
Secretary/Treasurer	Eric Verstappen (eric.verstappen@tdc.govt.nz)
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NZCS Coordinator	Alex Eagles (penguins@clear.net.nz)

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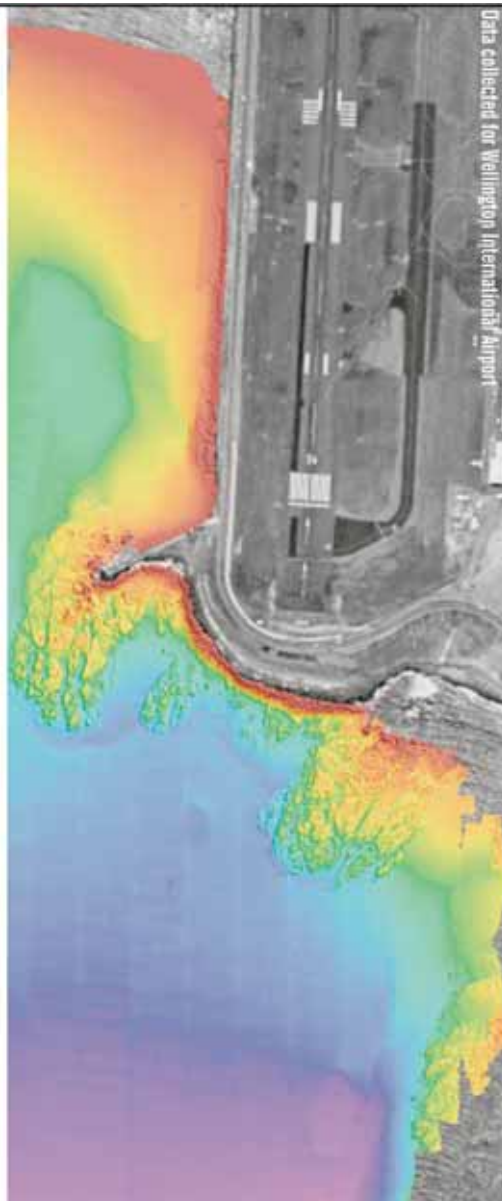


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# On Campus

## Coastal Research in New Zealand Universities

**Victoria University  
of Wellington**



**School of Earth  
Sciences**

In the School of Earth Sciences at Victoria University, while some research crosses the coastal boundary, Dr David Kennedy is the main academic working exclusively within the coastal realm. His focus is on landform systems and their development related to environmental and sea level change, especially over the last two sea level cycles. This work is concentrated around two main themes - coral reefs and rocky coasts and estuaries.



*Figure 1: Surveying on a sand cay on Elizabeth Reef, Tasman Sea. Apart from a few wrecks this is the highest point on the reef.*

### **Coral Reefs**

Coral reefs are sensitive environments as they grow under very specific environmental conditions. By looking at reefs at the limits of development such as the high latitude reefs in the Tasman Sea (Middleton and Elizabeth Reefs and Lord Howe Island) and the muddy reefs of Torres Strait, Northern Australia, extensive information can be gained as to how these systems respond to changes in their environment. For example, as they are already at the limits of growth, small changes in temperature can lead to major changes within the whole reef system. This information is important as it can help predict the sensitivity of reef systems to future climate change. Knowledge of the dynamics of reefs systems is also important for the siting of commercial activities such as pearl farming. This has led another member of the School, Associate Professor John Collen, to reefs such as Majuro and Penrhyn Atolls.

### **Rocky Coasts and Estuaries**

Rocky coasts are one of the least studied coastal landforms, although much of the internationally published work has come from New Zealand, especially in recent times (from Canterbury University). At VU rocky coast development is



*Figure 2: Vibrocoring on the sand and mud flats in Whanganui (Westhaven) Inlet.*

being investigated at a number of sites, such as Wellington and Otago, to analyse the effects of rock type and structure on platform morphology. As part of these studies imprints of tsunamis on these environments are also being investigated.

The focus of estuarine work has been in Whanganui (Westhaven) Inlet in Nelson. This large inlet is in an almost pristine state and several graduate students have been looking at its environment from a palynological, foraminiferal and sedimentological perspective. The inlet appears to have infilled rapidly soon after flooding by the sea. The current surface therefore is quite stable apart from the slow lateral migration of tidal channels. At the coarser end of the sediment scale Dr Warren Dickinson has been looking at boulder banks in the same region around Nelson.

Graduate students are of course the backbone of any university and over the past few years honours and masters students have been undertaking a wide variety of projects. Some of these have included beach profile change along the Manawatu Coast and of the newly nourished beach in Oriental Bay, as well as perceptions of erosion risk on the Kapiti Coast. Some of the current masters students include:

- Julie Smyth – Tidal channel stability of NW Nelson.
- Glenn Hughes – The Quaternary evolution of the Kapiti/Horowhenua coastal plain.
- Ryan Paulik – Shore platform morphology in weakly resistant lithologies.
- Caell Waikari – Environmental change of the Tasman Sea around Lord Howe Island, during the late Quaternary.
- Mike Millar – Sea-level variation in Whanganui Inlet.

### **School of Biology**

The School of Biology at VU also has an active research programme in coasts. They also have a focus on coral reefs (why is it the further you get away from the equator the more people want to

**Coastal  
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work there?). Dr Jeff Shima is looking at the dynamics of reef fishes and Dr Simon Perry the role of symbiotes in coral on sites such as Rarotonga and Palmyra Atoll. Within NZ the role of runoff on larvae of paua is being investigated by Dr Nicole Phillips, while some of those causing the run-off are being studied by PhD student Jo

Hoare whose topic is on the interactions between introduced predators and lizards on offshore islands. Dr KC Burns is also working on offshore islands studying vegetation communities.

Please feel free to contact David.Kennedy@vuw.ac.nz if you would like any further information or visit [www.vuw.ac.nz](http://www.vuw.ac.nz).

## Student Scholarships

The New Zealand Coastal Society offers a scholarship to students or recent graduates aimed at supporting their attendance at the Society's yearly conference. The 2005 scholarship, with a value of \$500, will be included in the registration pack to be collected at the NZCS Annual Conference being held in Tutukaka 12-15 October 2005. Applicants must be current members of the NZCS.

Applications should cover no more than one A4 page and contain:

- the applicant's name and contact details (postal address, phone number, email);
- the degree completed or enrolled in;
- date of completion or intended date of completion of the degree;
- the title of the dissertation or thesis and a brief (no more than 200 words) account of how the research relates to the goals of the NZCS;
- an estimated travel budget to the conference;
- the applicant's supervisor's signature.

The goals of the NZCS and membership forms can be found on the NZCS website [www.coastalsociety.org.nz](http://www.coastalsociety.org.nz).

The successful applicants must present a poster on their research at the annual conference.

Applications for the scholarship close on 31 July 2005.

Please send applications to:

Alex Eagles  
New Zealand Coastal Society  
287 Ohauiti Rd  
RD 3  
TAURANGA

The 2004 scholarships were awarded to Scott Lambert, who was studying the effects of sediment remobilisation following herbicide control of *Spartina* in estuaries in the Waikato and Hauraki regions and Javier Leon, who was investigating the coastal morphodynamics resulting from a sandy barrier at Shelly Beach in Otago Harbour.



*Scott Lambert during a sampling exercise in Raglan Harbour.*



*Javier Leon preparing for surveying at Shelly Beach.*

### 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  
Alex Eagles (e-mail: [penguins@clear.net.nz](mailto:penguins@clear.net.nz))**

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## Word from the Chair

Well we are certainly into the beginning of 2005 with a bang. I hope you are all settled back into life, work and play!

The NZCS Management Committee has taken on some projects for this year and is busy working on these on behalf of the members. There are just a few that I would like to touch on here. If you have any questions about any of these please feel free to contact any of the Management Committee.

- The preparations for the NZCS 2005 Conference in Tutukaka (on the east coast north of Whangarei) are well underway and it sounds like it will be an excellent conference with a great mix of exciting speakers, including Bob Dean as a Key Note Speaker, field trips and social activities. You will find a Call for Abstracts in this edition of *Coastal News*.
- We are undertaking a review of the Administration Service IPENZ provides for the NZCS. IPENZ has provided a supporting role since our inception but with changes to the IPENZ rules, changes within NZCS ourselves and ongoing voiced concerns about the lack of independence for NZCS from IPENZ we have agreed it is timely to undertake this review.

The report will outline the administration services NZCS requires, the existing costs from IPENZ, alternative options to secure these services and an analysis of the strengths and weaknesses of each option.

The assessment is being undertaken by a Steering Group of the Management Committee and will be made available

for members to comment on before the next AGM. I believe it is very important for NZCS to make sure we are getting the best service for our members and this report will help identify that for us.

- There have been a number of concerns voiced to, and by, the Management Committee in regards to the structure of the Corporate Membership and if this is providing our Corporates with the best service. Another report is being prepared by the Management Committee to look at alternative models for Corporate Membership and a decision will be at the next AGM about restructuring this membership sector. We will update you on that in the next *Coastal News*.
- The Coasts and Ports 2005 Conference in September in Adelaide is a Conference that the NZCS supports and you will find information on attending in this *Coastal News*. You may be aware of the reciprocal arrangement NZCS has with our Australian cousins and we do benefit directly from any New Zealand registering. The Coasts and Ports Conferences held here in New Zealand are extremely important for the ongoing financial stability of NZCS and we therefore strongly recommend support for this conference by NZCS Members.
- Finally, we are continuing to work closely with our Regional Co-ordinators to promote the discussion and debate on coastal issues in the regions through workshops, seminars and the like.

Lucy Brake  
Chair, NZ Coastal Society  
lbrake@beca.co.nz

## Running Across the Sahara Could Help Save NZ Penguins

Would you take a penguin to the desert? Well John Read isn't quite doing that, but he is running 240km across the Sahara Desert to raise funds and awareness for the New Zealand's hoiho or yellow-eyed penguins!!

undertaking the Marathon Des Sables (Marathon of the Sands) an endurance run which crosses the Sahara Desert in Morocco in the name of the endangered penguins.

John will run the distance over 6 days, between



7 to 18 April 2005, carrying all his food and equipment for the duration of the event. He will endure temperatures up to 49°C and have to negotiate running across steep sand dunes and rugged rocky terrain.

To support John and his superhuman efforts to help save the yellow-eyed

penguin visit the website:  
[www.wwf.org.nz/news/Marathon2005/MarathonHome.cfm](http://www.wwf.org.nz/news/Marathon2005/MarathonHome.cfm)

# Profile: Jenni Fitzgerald

NZCS Regional Coordinator for the Waikato



Jenni Fitzgerald is part of the Coastal Policy team for Environment Waikato where she has worked for the past year. Prior to joining EW she spent two years with Rodney District Council, initially processing resource consent applications,

before moving to the Forward Planning department as a Policy Planner where her focus was on coastal and natural resource issues.

At EW, Jenni is involved with a variety of projects including work on coastal erosion and local coastal planning exercises. A key area of focus for the

future will be west coast issues within the Waikato Region. Current issues include mangroves, vehicles on beaches, and harbour protection.

After a few years off from study Jenni completed a Bachelor of Social Sciences in Geography, and Resources and Environmental Planning at Waikato University in 1999. She is currently studying towards a Masters degree in REP also at Waikato University.

Jenni spends her free time fishing (in fact, she recently enjoyed fishing in the sun on the Gold Coast during a midwinter holiday), playing indoor netball, hanging out with family and other outdoor activities such as tramping around Lake Waikaremoana.

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## Sandy Bits

### Fiordland Marine Management Bill

The Government is aiming to create eight new marine reserves in Fiordland with the help of a special Bill. The new reserves will cover 10 of the 23 regions identified as containing "outstanding areas of biodiversity" including most of Bligh Sound.

### Understanding Waves Crucial in Port Safety

NIWA have been investigating how waves generated by a distant storm can affect safe access to and from NZ's ports and harbours for the Maritime Safety Authority's Environmental Assessment Task Force. At some ports the height of the swell can affect the clearance under the ship's keel as it makes passage through a dredged shipping channel. Incidents in the last two years, such as the Jody F Millenium off of Gisborne and Capella Voyager off of Marsden Point, have highlighted the need for monitoring and forecasting the sea state. NIWA have found that

a wave-rider buoy is the most suitable for water depths over 20m while other means such as Acoustic Doppler Current Profiler meters, remote cameras, and portable microwave Doppler radar systems are more appropriate for shallower environments. NIWA is currently trialling a wave/swell forecasting system which predicts the sea state up to 126 hours ahead

### New Marine Reserve For Taranaki

A 1547ha Tapuae Marine Reserve, which will include half the Sugar Loaf Island group and adjacent subtidal and intertidal seabed, is proposed for the New Plymouth coast. Over 400 marine species typical of the Taranaki volcanic apron, nesting habitats for seabirds, and the northern-most breeding ground for the NZ fur seal are all encompassed in the proposed area. If successful, the marine reserve will be only the second one on the west coast of the North Island with the other being around Kapiti Island.

*continued from page 7*

### Google Scholar

[scholar.google.com](http://scholar.google.com)

Google has released a new free tool called that allows you to look up any author, publication or technical topic and find all of the other articles or websites that cite that work, ordering them by relevance. Google Scholar enables you to search specifically for scholarly literature, including peer-reviewed papers, theses, books, preprints, abstracts and technical reports. Google Scholar also automatically analyses and extracts citations and presents them as separate results, even if the documents they refer to are not online. This means that search results may include citations of older works and seminal articles that appear only in books or other offline publications.

### Social Science Tools and Methods for Marine Protected Areas Management

[www.csc.noaa.gov/mpass](http://www.csc.noaa.gov/mpass)

The National Oceanic and Atmospheric Administration has a website on research techniques for examining the 'human dimensions' of marine and coastal resource management. The website gives basic information about social science concepts and methods, and guides managers in determining the appropriate tools, such as surveys and cost-benefit analyses, to address their specific issues. The site is divided into sections that focus on social science themes (including use patterns; attitudes, perceptions and beliefs; governments, institutions and processes; communities; and economics), tools, case studies, and references.

# News from the Regions

## Bay of Plenty Region

*Aileen Lawrie, NZCS Bay of Plenty Regional Coordinator*

### Mangrove Management Consent at Environment Court

Tauranga City Council's mangrove management consent application is going to the Environment Court in the week of 8 March 2005 after attempts at negotiation, with one of the appellant parties choosing not to attend any of the mediation meetings held last year. The proposal involves the removal of Mangroves from areas of the Waimapu, Welcome Bay, Waikareao and Matua arms of Tauranga Harbour.

### Mt Maunganui Surf Reef Being Built

The artificial surf reef at Tay Street, Mt Maunganui has so far raised \$800,000 of the \$1 million cost to construct the 50-m long sand bag structure, and will start construction in February 2005. The coastal permit for the reef was approved on a non-notified basis in September 2000 and has successfully withstood a judicial review sought by Sun Pacific Villas, a timeshare located adjacent to the proposed reef site.

### Western Bay of Plenty District Council

WBOPDC are in the process of finalising a plan change for Waihi Beach to make subdivision a prohibited activity and to strengthen plan rules relating to additional dwellings in the coastal hazard primary risk zone. They have also made applications to themselves and Environment Bay of Plenty for a 1050 metre seawall at Waihi Beach along Shaw Road and parts of The Loop. Stream training groynes and dune works are also proposed.

### Wave Buoy

The Environment Bay of Plenty wave buoy has now been up and running for over a year, supplying valuable data on the offshore environment. Live on the councils website at <http://www.envbop.govt.nz/water/levels/wave-buoy.asp>, it is now one of the most frequently hit pages.

### Offshore modelling

In addition to the wave buoy, current meters have been deployed around the Bay of Plenty collecting information on offshore current speed and direction. Water quality data is also being collected for the productivity modelling being carried out by ASR Limited. A further project is underway by NIWA to relate sea surface temperatures to productivity. Contact Stephen Park for more information.

### Tsunami

A report has been completed for Environment Bay of Plenty and Environment Waikato detailing

tsunami risk for the Bay of Plenty and Eastern Coromandel. The report brings together geophysical survey results, eye-witness accounts, written records, and data on the behaviour of tsunamis. A hazard profile for the eastern coastline of the Bay of Plenty and Coromandel has been developed that indicates the following:

- In the past 4000 years two major regional and four localised paleo-tsunami events have been recorded – all greater than the 5m resolution level for detection in the paleo record.
- Eleven tsunamis are recorded in the historical record - all of less than 3m.
- The estimated return period for tsunami (for example, 322 years for a wave height of 2.5m) calculated from the historical record is likely to be an overestimate given the recent paleo research.

A review of these return periods, based on additional research, has been commissioned and the findings are due very shortly.

Contact Stephen Lamb for more details.

## Wellington Region

*David Kennedy, NZCS Wellington Regional Coordinator*

### Oriental Bay Beach

The new beach in Oriental Bay has proved a hit with locals and tourists alike flocking to it once summer finally arrived. Some sand movement has occurred since its construction and recently one of the offshore protective bars was modified to provide additional protection from waves generated during Wellington's brisk northerlies. This movement appears, however, to have been within the expected design limits.

### Shipwreck given approval

The proposal to sink the former frigate HMNZS Wellington on the south coast has gained further momentum with the Government selling it for \$1 and providing a free tow from Auckland.

### Tsunami waves

The recent tsunami disaster has proved to be of considerable interest given Wellington's history of such events, with a wave just under 10 metres occurring in Palliser Bay in the 1855 Wairarapa earthquake and a seiche of a couple of metres occurring in Wellington Harbour. This interest has been further heightened by the recent earthquake swarm that has occurred during January.

## Waikato Region

*Jenni Fitzgerald, NZCS Waikato Regional Coordinator*

### NZCS/NZPI Waikato Regional Seminar – "Beyond the CMA"

A joint Coastal Society / Planning Institute seminar

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in November attracted around 50 attendees from a wide variety of backgrounds, from grizzled practitioners to fresh-faced students. The evening's key presentations were delivered by Dr Nick Edgar (Landcare Trust) and Raewyn Peart (Environmental Defence Society). These were followed by a brief presentation by EW Coastal Scientist Rick Liefting on recent erosion at Mokau as part of a 'Regional Roundup' session.

Dr Edgar's presentation gave an overview of a recently completed two-year MfE project - Integrated Catchment Management (ICM): Sharing Community Best Practice Nationally - including lessons learnt from a range of community-based catchment projects from across the country. These ICM experiences also contributed to the recently released Parliamentary Commissioner for the Environment's report - "Growing for Good: Intensive farming, sustainability and New Zealand's environment".

Raewyn Peart is Senior Policy Analyst with the Environmental Defence Society, and author of their recent publication "A Place to Stand: The protection of New Zealand's natural and cultural landscapes". Raewyn's presentation focussed on how to achieve more effective protection of New Zealand's coastal landscapes and discussed what landscapes should be protected, what they are threatened by, what management tools are available to manage the threats and the effectiveness or otherwise of these tools. It incorporated material from several case studies carried out as a part of the 2003 EDS landscape protection study and concluded with some suggestions for a way forward.

Fraser McRae (Waikato District Council) and Kate Mackness (Hamilton City Council) contributed to the evening with a brief run-down on some of the issues for their respective organisations.

The speakers sparked considerable lively debate which continued on amidst the clean-up, and the feedback was excellent. The evening was additionally co-sponsored by Beca and Environment Waikato.

### **Vehicles on Beaches**

Environment Waikato is hosting a workshop of management agencies with responsibilities for areas along the Region's west coast in early February. The issues associated with vehicle use on beach and dune areas are well-known around the country and use continues to escalate. Hot spots within the Region include Karioitahi, Raglan, Kawhia, Mokau, Marokopa and Awakino.

There are a number of factors that combine to make this a complex issue. These include the overlapping jurisdictions of multiple management agencies which may include regional councils, territorial authorities, NZ Police and Department of Conservation, and lack of coherence between existing regulatory regimes. There is also confusion about the status of beaches as public

roads and how this relates to resource management regimes.

One of the aims of the February workshop will be to establish a common understanding of the issues, including existing regulations and jurisdictions, in order that the public are receiving a consistent and correct message when it comes to who does what, when and where.

If you should have any queries about this project, contact Jenni Fitzgerald (Jennifer.Fitzgerald@ew.govt.nz).



### **Tsunami Threat Greater than Expected**

The threat of tsunami in the eastern Coromandel and Bay of Plenty is much higher than previously thought, a study has found. The eastern coastline can expect a one metre tsunami every 80 years and a 2.5 metre wave every 320 years, Environment Waikato's Environment Committee meeting heard in November. Areas most at risk include the open coast from Otama Beach to Port Charles and out to Great Mercury Island and Mercury Bay especially Whitianga.

A joint investigation into tsunami hazard by Environment Waikato and Environment Bay of Plenty has found that the risk is high enough to rank it the highest regional risk for a locally generated tsunami and sixth for one generated elsewhere in the world.

The research identified tsunami activity in the previous 5000 years along the eastern coastline and pinpointed sites for additional research and field investigations. Core samples catalogued tsunami events, identified hot spots and the final stage would develop appropriate response, planning and management actions.

A hazard profile indicates there have been seven tsunami recorded in the past 85 years that have generated a wave height of up to a metre with five events since 1700, generating wave heights of one to three metres. There have been six events as far back as 3000 years with a wave height higher than five metres.

Any questions about this should be directed to Lamorna Cooper (Lamorna.Cooper@ew.govt.nz).

### **Coastal Weed Discovered in Whangamata**

The plant pest boneseed, or salt bush, has been





discovered in Whangamata, and Environment Waikato is anxious to get rid of it. Plants were found for the first time in this area on two properties in the Whangamata township during routine inspections.

Boneseed, also known as salt bush or bitou bush, is a threat to low coastal vegetation, where it can rapidly take over and replace native plants, including pohutukawa. It is a fast growing shrub that can produce up to 50,000 seeds a year. Environment Waikato regards it as a 'containment' pest, requiring removal of all plants.

The plant's thick growth could restrict people's access to beaches, and it could be difficult to control because of the large numbers of seeds it produces. Seeds can remain dormant in the soil for up to 10 years. Birds and possums eat the fleshy fruit and spread undigested seeds into neighbouring shrub lands and coastal forests.

Seed germination is stimulated by fire, and it grows best in dry sunny conditions in coastal areas, cliffs, sand dunes and wasteland. The bushy shrub grows up to three metres tall, with leathery, paddle-shaped leaves, with toothed edges and a powdery surface. It has yellow daisy-like flowers from September to February, and clusters of small fruit that turn from green to black when mature.

The South African native was first brought to New Zealand as an ornamental plant. Infestations have previously been found around Waihi, Raglan and the Coromandel Peninsula. Boneseed is banned from sale, propagation, distribution or commercial display.

Please direct any questions about plant pests in the Waikato Region to Peter Russell (Peter.Russell@ew.govt.nz).

### Upper South Island Region

*Eric Verstappen, NZCS Upper South Island Regional Coordinator*

### Marahau foreshore gets a face lift

Marahau lies at the southern gateway to the Abel Tasman National Park. The once-quiet seaside retreat is the major departure point for tramping, kayak and water taxi access to the park. Not surprisingly, it has also attracted significant development pressure. Erosion of and subsequent piecemeal rock revetment works to the settlement's foreshore margin has severely impacted on safe access through and along the foreshore and access to the park. To ease traffic congestion and recreate foreshore parking and amenity areas, the Tasman District Council has embarked upon a foreshore enhancement program. The \$1 million Stage I works included widening the road reserve, rebuilding failed rock revetments, and providing new boat ramp, jetty and groyne structures. These were completed in late 2004. Stage II works will comprise construction of a northern groyne and beach renourishment (\$0.3M) with road reconstruction works to follow as Stage III.



### Beach renourishment for new tourist facility

Immediately north of the Marahau settlement and nestled between the Marahau river estuary and coastal foreshore lies a largely undeveloped 18 ha tract of private land. The owners have been granted consent for a significant tourist accommodation and visitor facility. However, to offset the potential effects on this development of a persistent, severe erosion trend, consent has also been granted for a staged beach renourishment program. The first stage involved the placement of 5000 cubic metres of sand along the 600m foreshore and was undertaken in late 2004. The sand is sourced from the intertidal platform seaward of the Otuwhero sandspit south of the Marahau community, being the deposition area for much of the sand originally eroded from the beach.



### 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.

# Profile: André LaBonté



André LaBonté is a director of LaBonté Coastal Consultants Limited, a consulting engineering business specializing in harbour, dune and beach restoration plans, coastal protection investigations and

resource consent applications involving activity in the coastal marine zone.

He has a BSc majoring in Biological Sciences, a minor in Oceanography and Marine Biology, and a BSE degree majoring in Ocean Engineering. He has had over 35 years experience as a consultant for private, academic and government institutions.

During his career he has worked in the offshore oil industry, been involved in coastal pollution research and monitoring and served as a consultant to the United States Congress evaluating base-line environmental monitoring programs. He served as Assistant Professor and Chairman of the Marine Science department at Miami Dade Community College (University). He qualified as an aquanaut in the Scientist in the Sea program in 1974. He has been involved in coastal and ocean engineering projects on the eastern seaboard of the United States and Caribbean. Major emphasis of this work was environmental monitoring associated with beach

restoration projects, inlet and coastal hydrographic surveying and engineering inspection of coastal structures.

Since moving to New Zealand in 1985, he has served as a consultant and expert witness to the Ministry of Works and the Department of Conservation at hearings regarding issues of coastal pollution in New Zealand. He worked under contract with the Department's Northland Regional Conservancy evaluating projects associated with the Harbours Act prior to the RMA. He has served as the Minister of Conservation's representative at Restricted Coastal Activity hearings.

As the consulting engineer to the Mangawhai Harbour Restoration Society, he developed and implemented the Mangawhai Harbour Restoration Plan, being responsible for the design, implementation and monitoring associated with restoration of the Mangawhai Harbour, inlet, river channel and dune stabilization. In 1998, he, along with his wife Robin (also an ocean engineer), designed and implemented the construction phase required to remove eight 400 tonne fuel storage tanks by barge from the Marsden Power Station ocean beach for relocation to Fiji and Tauranga. Currently he is involved in the nearshore sand mining issue providing expert evidence regarding this internationally outdated practice.

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*"Be the change that you want to see in this world" — Ghandi*

## 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

Northland	André Labonté	labonte@xtra.co.nz
Auckland	Scott Nichol	s.nichol@auckland.ac.nz
Waikato	Jenni Fitzgerald	jennifer.fitzgerald@ew.govt.nz
Bay of Plenty	Aileen Lawrie	aileen@envbop.govt.nz
Hawkes Bay	Gary Clode	garyc@hbrc.govt.nz
Taranaki	Peter Atkinson	dwk.newplymouth@duffillwatts.com
Manawatu/Wanganui	Johanna Rosier	d.j.rosier@massey.ac.nz
Wellington	David Kennedy	david.kennedy@vuw.ac.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
	Paul Pope	poppa185@student.otago.ac.nz or popey@xtra.co.nz
Southland	Ken Murray	kmurray@doc.govt.nz



# Rabbit and Hare Control in New Zealand's Coastal Environment



Damage caused by rabbits (*Oryctolagus cuniculus*) and hares (*Lepus europaeus occidentalis*) is acknowledged to be a major factor in the decline of coastal sand dune vegetation, particularly on open dunefields and in foredune environments. It is also a major contributor to the failure or decreased performance of dune revegetation programmes.

Rabbits and hares are not native to New Zealand, but are present throughout most of the country. These introduced animals browse on most plant species in the sand dune ecosystem, showing marked preference for new growth and seedlings.

Rabbits can live in large colonies and have a serious effect on coastal vegetation, especially on open dune areas. They contribute significantly to failure or poor performance of dune revegetation programmes.

Hares have wide-ranging, scattered populations and different behaviour patterns from rabbits, but can cause significant localised damage to coastal plants. They clip vegetation with a 45° cut.

Total eradication is not an option along mainland



Figure 1: Rabbits often live in colonies and are prolific breeders, able to produce 30 -35 young in a season.



Figure 2: Hares are larger than rabbits, are more yellow-brown in colour, with a darker head and black-tipped ears. They have relatively long legs and run with a loping gait.

coastal areas as rabbits will always re-colonise when treatment ceases. Effective control of rabbits and hares requires a large percentage kill (90%) or the populations will very rapidly return to their original size.

The need for rabbit and hare control should be assessed before any planting programme is set up. Long-term commitment to sustained treatment is needed to prevent destruction of planted material.

Monitoring of rabbit and hare populations provides a sound basis for an effective programme. Continued monitoring and evaluation will identify the success of control operations and allow effective targeting of follow-up treatment. Good communication between all groups involved is critical for the success of any control project.

A wide range of control methods for rabbits and hares has been developed. Some are suited to large-scale control programmes, others are only practical on a small scale. Control may be most effective through use of a combination of control measures, rather than a single one.

A carefully managed programme of poisoning with Pindone-treated baits, from early winter to early spring, is the most successful method for controlling rabbits.

Exclusion fencing can be effective for small areas where frequent inspection and maintenance can be carried out, because burial or excavation by wind can allow animals access to the enclosed sites.

Repellents can discourage browsing of new plantings by both rabbits and hares, but must be applied several times a year to protect new growth. For control of hares, however, night-shooting is likely to be the most effective method.

Community-led pest-control projects, using standard methods for collection of information about rabbits and hares on sand dunes, could make a valuable contribution to protection and understanding of New Zealand's coastal dune vegetation.

D E Unsworth  
Coastal Dune Vegetation Network  
diana.unsworth@forestresearch.co.nz

Further information is available in a recent Coastal Dune Vegetation Network report, *Rabbit and Hare Control in the Coastal Environment of New Zealand - Review and Recommendations*, D E Unsworth, Forest Research, Rotorua, 2005. Available from greg.steward@forestresearch.co.nz.

# Conferences and Workshops

## **Solutions to Coastal Disasters 2005**

*May 8-11, 2005, Charleston, South Carolina, USA*

The Coasts, Oceans, Ports and Rivers Institute (COPRI) of American Society of Civil Engineers (ASCE) 2005 conference will include topics on erosion, hurricanes, coastal storms, tsunamis, seismic Events, climate change, sea level rise, and wind hazards.

For further information visit  
[www.asce.org/conferences/cd05](http://www.asce.org/conferences/cd05).

## **International Conference on Ocean/Coastal Science and Engineering Education**

*June 6 – 8, 2005, Gold Coast, Queensland, Australia*

The conference aims to improve coastal/ocean education and to encourage collaboration. Papers on past experiences, new ideas, methodologies, international partnerships and results with regard to coastal/ocean engineering and science education and research are welcome.

For details visit:  
[www.griffith.edu.au/school/eng/OCSEE/OCS EE.html](http://www.griffith.edu.au/school/eng/OCSEE/OCS EE.html)

## **Land-Ocean Interactions in the Coastal Zone Conference**

*June 27-29, 2005, The Netherlands*

The Land-Ocean Interactions in the Coastal Zone (LOICZ) inaugural open science meeting will address the geographic and scientific scope of LOICZ research for the next decade. Abstracts are invited on the following themes: vulnerability of coastal systems and hazards to people; implications of global change for coastal ecosystems; anthropogenic influences on the river basin and coastal zone interactions; fate and transformation of materials in coastal and shelf waters; and coastal system sustainability by

managing land-ocean interactions.

For information see [www.loicz.org/conference](http://www.loicz.org/conference) or contact the LOICZ conference secretariat at [loicz.conference@nioz.nl](mailto:loicz.conference@nioz.nl).

## **International Conference on the Mediterranean Coastal Environment**

*September / October, 2005, Kusadasi, Turkey*

The bi-annual MEDCOAST Conference will focus on a wide range of coastal and marine issues and subjects including coastal and marine policy, science, engineering and management.

For further information visit  
[www.medcoast.org.tr](http://www.medcoast.org.tr).

## **International Marine Protected Areas Congress**

*23-27 October, 2005, Geelong, Victoria, Australia.*

The IMPAC congress will encompass research, planning, management and conservation of MPA from inshore areas to deep seas.

For more information visit  
[www.impacongress.org](http://www.impacongress.org) or contact John Senior [jsenior@parks.vic.gov.au](mailto:jsenior@parks.vic.gov.au).

## **Canadian Coastal Conference**

*6-9 November, 2005, Dartmouth, Nova Scotia, Canada.*

Topics of the 2005 CCC include: numerical and physical modelling; development and application of coastal GIS; acquisition, analysis and interpretation of coastal data; ice impacts on shorelines; instrumentation and methods; design of shore protection; innovative practices in engineering and shoreline management; and impacts and adaptation to climate change.

For information, access [www.ccc2005-ccl2005.ca](http://www.ccc2005-ccl2005.ca).

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## **Coasts and Ports Conference**

*September 20-23, 2005, Adelaide, Australia*

The 2005 Coasts and Ports Australasian Conference is the melding of the 17th Australasian Coastal and Ocean Engineering and 10th Australasian Ports and Harbour conferences. This series provides a unique opportunity for those interested in coastal engineering and coastal and port development to share knowledge and experience for the benefit of all.

Significant themes will include:

- Coastal processes: their modelling, prediction and management
- Coastal planning and policy
- Catchment to coast
- Local government and the coast
- Aquaculture engineering, policy and planning
- Port infrastructure and its accommodation within urbanised coastal areas

- Maximising port efficiency by coordinating diverse business needs
- Managing the needs of society, the environment and industry
- Innovation in coastal, ocean and port engineering

Key note speakers will be: Prof. Ian Young, Swinburne University of Technology, Vincent Tremain, CE Flinders Ports, and Dr Robert Engler, PIANC.

The Conference will be held at the Adelaide Hilton, in the centre of the city and adjacent to Adelaide's theatre and restaurant districts. A three day scientific program is planned in association with a trade exhibition, a comprehensive partner program and opportunities for all delegates to enjoy pre and post conference tours to some of Australia's major attractions.

For further information visit  
[www.plevin.com.au/coastsandports2005](http://www.plevin.com.au/coastsandports2005) or email [coastsandports2005@plevin.com.au](mailto:coastsandports2005@plevin.com.au).



# 2005

## NEW ZEALAND COASTAL SOCIETY CONFERENCE

12<sup>th</sup>  
to the  
15<sup>th</sup>

# OCTOBER

The 2005 New Zealand Coastal Society Conference is being held in Tutukaka at the Oceans Hotel and the Whangarei Deep Sea Anglers Club.

## Coastal Problems? **Innovative Solutions.**

### PROGRAMME

**Wednesday 12<sup>th</sup> October 2005**

5.30pm - 7.30pm

Social Function to welcome delegates Oceans Hotel.

**Thursday 13<sup>th</sup>/Friday 14<sup>th</sup> October 2005**

NZCS Conference with local and regional field trips.

**Saturday 15<sup>th</sup> October 2005**

Trip to the Poor Knights.

### KEYNOTE SPEAKER

**Robert G. Dean**

### DINNER SPEAKER

**Wade Doak**

### ACCOMMODATION

**Oceans Hotel** - [www.oceanshotel.co.nz](http://www.oceanshotel.co.nz)

**Pacific Rendezvous Resort Motel** - [www.oceanresort.co.nz](http://www.oceanresort.co.nz)



## CALL FOR ABSTRACTS

**Due 1 May 2005**

Examples of topics could include:

- allocation of space in the coastal zone;
- aquaculture;
- the planning environment: coastal zone vs. coastal marine area boundary;
- ability to rationalise mooring allocation;
- sand extraction;
- land development near the coast; and
- hard vs. soft structures for coastal protection.

The organising committee are looking for "how to do it" papers with a teaching/training focus as well as those that are informative and present innovative solutions to coastal problems.

**Please forward abstracts to:**

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