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Blasting Reefs Key to Nation's Development

Blasting channels in coral reefs, particularly on small and environmentally vulnerable islands such as Tuvalu, often results in considerable environmental damage and costs. However, creating man-made boat channels is also seen as an integral part in assisting outer-island development and the raising of living standards.

Tuvalu is one of the smallest and most isolated island nations in the world. The nine islands that make up the archipelago have a combined total land area of only 26 sq km dispersed within an Exclusive

Economic Zone of approximately 1.3 million sq km. Of the nine atolls, five (Nanumea, Nui, Nukufetau, Funafuti and Nukulaelae) can be considered true atolls but only Funafuti and Nukufetau have natural passages that permit ship passage from ocean to lagoon. Three, (Nanumaga, Niutao and Niulakita) are single table reef islands with small land-locked lagoons. Vaitupu has composite characteristics of both an atoll and table reef and has the largest landmass of the nine islands. The maximum elevation of land on any of the islands is generally less than 5m above sea level.

Development of the eight outer islands is a key priority for the Government of Tuvalu. Obtaining a more even balance of incomes and living standards across all island communities, and

better provision of public services, is seen as fundamental in relieving some of the population and environmental pressures currently occurring on Funafuti.

The limitations of inter-island transport and difficulty of access to many of the outer islands is a major constraint on achieving these development objectives. No inter-island air service operates, and until mid 2002, all internal island transport requirements were met by a single passenger/cargo vessel. The introduction of a

new inter-island passenger and freight vessel in 2002 has improved services substantially, with most of the outer islands now serviced on a two-week basis by one of these two vessels.

On most of the outer islands, the inter-island vessels sit in deep water offshore with cargo



Figure 1: Unloading the tender boats on Nui atoll as the inter-island ship, the *Manu Folau*, sits offshore. (NIWA)



Figure 2: Tender boat crossing the reef edge via the man-made boat channel on Niulakita atoll. (NIWA)



and passengers transferred to and from shore on small tender boats (Figs. 1 & 2).

With the exception of Nukufetau, where the inter-island vessels are able to enter the sheltered waters of the lagoon, the movement of the tender boats over the shoaling and breaking waves at the edge of the fringing reefs that surround each island, is extremely hazardous.

This results in considerable weather and tide-related dependency and risk in the transfer of both passengers and cargo from boat to shore and back (Fig. 3).



Figure 3: Bags of concrete stranded on the reef flat of Nukulaelae after a tender boat capsized crossing the reef. (NIWA)

Prior to the early 1970s, the only outer atoll with a boat channel through the fringing reef was Nanumea, created by the United States Military during World War II. Over the last 30 years, New Zealand has assisted the development of small boat channels through the outer reefs on all the other outer islands, as well as studies to identify the ecological impacts, and the development of environmental guidelines to minimise and mitigate impacts, from channel creation. All of the outer atolls now have at least one reef channel, which is typically around 8 m to 13 m wide, approximately 1.5 m deep (relative to the reef flat level) and extends over the fringing reef to about 10 m to 15 m from the toe of the beach (Fig 4).

The present study was commissioned by the New Zealand Agency for International Development (NZ AID) and conducted by NIWA, the South Pacific Applied Geoscience Commission (SOPAC), and representatives of the Government of Tuvalu. Its purpose was to assess the social, economic and environmental impacts of the reef channels on each outer atoll and to develop, with the Government of Tuvalu and outer island communities, the future requirements and needs to improve the effectiveness and efficiency of ship to shore movements of passengers and cargo on each atoll.

Part of this involved a three week trip to all eight outer islands with discussions held with the decision-making bodies (Kaupule) on each island, and reef channel users, such as the Tuvalu Cooperative Society, community fisheries, health representatives and others.

The perception on all outer-islands was that the reef channels have resulted in a number of direct and in-direct benefits to the island communities. These include reduced risks during passenger and cargo transfers, reduced offloading time, reduced damage to cargo, improved access to ocean fishing ground (thus reducing pressures on reef fisheries) and, increased range of goods at the community store. On some islands the channels are also considered a factor in increased passenger movements and improved links with outer-island communities in Funafuti.

The reef channels project was carried out over a period of considerable developmental change in the outer-islands, including electrification and telecommunications projects, the construction of health and fishery centres, and more permanent housing through the use of imported construction materials.

All these projects have required heavy equipment and large volumes of materials to be brought on island, which would have been considerably more difficult and risky without the access provided by the channels.

Environmental impacts caused by channel construction do not appear to be significant, largely due to the prior development and subsequent application of environmental guidelines developed for the project. The only area of concern on a number of islands is due to exacerbated erosion related to the interaction between the channels and more recently constructed concrete beach ramps.

However, facilitating vehicular access to the edge

continued on page 3



Figure 4: The reef channel on Niutao atoll. Note the erosion being caused by the concrete ramp, part of which has been removed. (NIWA)

of the reef channels to permit crane trucks, which are being supplied to most islands by Japan, to offload the tender boats is an important future consideration in reducing the amount of manhandling of cargo.

It was identified during the review that current volumes of imported cargos on most islands were now too great to be effectively offloaded by hand and carried up the beach, leading to increasing

cargo damage, injuries, and offloading times.

Despite this vehicular access over the beach needs to be achieved in a way that minimises impacts on beach processes, and does not increase the vulnerability of these already fragile island systems.

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A Word from the Chair

The new year gives us a chance to look forward on many fronts, including of course on the coast. Now is perhaps one of the most interesting and exciting times to be part of coastal management - with the property boom seeing residential development at unprecedented rates, the issue and opportunities surrounding customary rights to the foreshore and seabed, and also the increasing frequency with which one reads of climate change, which will of course greatly affect the coast, in the media.

The New Zealand Coastal Society Management Committee is also looking forward to an exciting 2004, with many opportunities and issues on the horizon.

After a very successful 2003, in which we increased membership, saw the publication of the "New Zealand Coast" book, published some very high-quality editions of *Coastal News*, and co-hosted the "Ports and Coasts" conference, the committee has given some thought as to how we can top those achievements in 2004.

The Management Committee has developed a list of priorities for the year (up to October), of which the top three are as follows:

- 1 Determine the best way to allocate some of the NZCS funds to support coastal initiatives in New Zealand.
- 2 Continuing to improve our membership management processes and systems.
- 3 Maintaining and improving our relationship with other coastal management agencies.

I look forward to reporting to you on the results of these initiatives at the 2004 AGM, but in the meantime I hope you enjoy the last of the summer and that you all visit at least a few beaches along the way.

Best wishes

Harvey Brookes, Chairman, New Zealand Coastal Society
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**Coastal
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NZCS Management Committee

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Managing Samoa's Coastal Environment

Samoa's coastal environment plays a pivotal role in the nation's social and economic wellbeing. It is estimated that 70% of inhabitants are located within the coastal margin, which provides an important source of protein in the form of seafood for the islands' subsistence economy.

Figure 1: Coastal erosion at Leusoalii, Upolu. Intensive coastal development and the location of lifeline infrastructure along the coast has exacerbated coastal hazards on Upolu and Savaii, particularly following cyclone events.

The intensity of development within the coastal area has resulted in large capital expenditure both by central government (in the form of roads, telecommunications and water supply), as well as investment by villagers (such as crops, houses and reclaimed land). However, much of this investment is located within coastal hazard prone areas, susceptible to coastal flooding, landslips or erosion. These areas are particularly susceptible during cyclones, which visit the islands an average of every ten years.

Natural resources, such as the islands' coral reefs and sandy beaches, play an essential role in not only protecting the physical resources that are located within this coastal zone, but also the very wellbeing of the islanders themselves.

From 2000 to 2002 Beca Planning worked under a contract, funded by the World Bank, to develop a Coastal Infrastructure Management Strategy (CIMS) and Coastal Infrastructure Management Plans (CIM Plans) for the Government of Samoa to manage the natural coastal resources. The Strategy and Plans clarify the role of government departments, infrastructure providers and villages in managing and minimising the risk of coastal hazards.

With a deliberate aim of "institutional strengthening", the CIM Strategy and CIM Plan process was undertaken through a close working relationship with central government and each of the villages to reconfirm the significance of infrastructure to social wellbeing and overall cyclone resilience.

Recognising the significance of coastal hazards, for Samoa's CIM Strategy a one key word

approach to coastal management was adopted. The word chosen was 'resilience'; a word that embodied all that the project aimed to achieve to improve coastal management.

The CIM plans underpin the Strategy and are the cornerstone of the village based management approach, and the need to manage infrastructure in a coordinated and strategic manner to improve cyclone and hazard resilience. Each of the plans was prepared to address the unique social, political, economic and environmental circumstances of the individual villages and districts which they cover.

Given the lack of any government funding for enforcement of the CIM Plans and the lack of regulatory methods so often relied on in New Zealand, the involvement and 'buy in' of every



Figure 2: District Consultation meeting – Falealili. Meetings like this were intended to identify an appropriate resource management approach for the natural and physical resources in each village in order to improve cyclone resilience.

village as well as the key service providers (water, electricity, roading, etc) was essential to the success of the strategy and each of the CIM plans. This was achieved partly by undertaking a broad brush economic analysis of various engineering options, (such as seawalls, or beach nourishment), or planning approaches (such as managed relocation) and by informing villages of the implications of various land use practices.

Not surprisingly, consultation was critical to the success of the project. The consultation process for the CIM Plan preparation was devised to meet a number of important goals. The first of these was to gather information on the coastal issues facing each village and solutions adopted. The second aim was to educate every village directly

on the various solutions on how best to respond to both natural and human induced coastal processes and some of the problems associated with current responses. Thirdly, the aim was to facilitate an effective working relationship between each village and the various service providers, and finally to enable the formation of a working committee to feed back to the CIM plan writers as the plan was prepared.

Although the project is still not complete and a number of CIM plans are yet to be prepared, confirmation of the project to date can be seen in some of the major infrastructure investment that is now proposed for Samoa. These include investigations into an alternative inland road from Faleolo Airport to Apia, to replace the vulnerable coastal route, and a financial commitment from the World Bank to part fund the relocation of government and village infrastructure away from hazard prone areas.

Equally promising are localised initiatives such as that by the Vaimauga East Village to prosecute unlawful sand miners, and a commitment to rebuild any new infrastructure away from hazard prone areas.

The CIM Plans have also formed the basis of the National Adaptation Programme of Action, which outlines priority response actions in responding to predicted sea level rise.

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Figure 3: Commercial sandmining at Siufaga, Upollo. Most of this sand has been used by the local construction industry with little benefit to affected villages.



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Whangarei Coastal Management Strategy

Environmental Defence on the Coast

Coastal News



The Environmental Defence Society (EDS) is a non-profit organization involved in actively seeking improved management of New Zealand's coast. The main focus of EDS, which is comprised largely of environmental professionals, is achieving good environmental outcomes through litigation, improving law and policy, education, and support for local environmental groups.



Figure 1: The Whangarei Heads are under heavy pressure for subdivision. (EDS)

EDS are currently heavily involved in litigation and negotiation to seek better outcomes from coastal subdivision. At present the Society are appealing the provisions of the Far North district plan affecting coastal management and are presenting submissions on the coastal provisions of the Rodney district plan.

EDS has been involved in numerous subdivision and development applications in coastal areas under pressure including the Coromandel Peninsula, Whangarei District and the Bay of Islands. The Society was a key player in the successful campaign to persuade the government to purchase Waikawau Bay earlier this year when the University of Auckland placed the sensitive headland on the market.

Litigation work by EDS over the past few years has identified an increasing problem with poorly controlled coastal subdivision. This prompted the initiation of a study on the protection of New Zealand's important landscapes. The study included case studies of the Whangarei District, Waitakere Ranges, Coromandel Peninsula, Banks Peninsula and Wakatipu Basin. The results of the study, which are set out in the report *A Place to Stand: the Protection of New Zealand's Natural and Cultural Landscapes*, will be released early in the



Figure 2: Waikawau Bay was purchased by the government earlier this year. (New Zealand Herald)

new year and will be available on www.eds.org.nz.

To highlight concerns with the loss of landscape, primarily on the coast, EDS joined with the New Zealand Institute of Landscape Architects to host in July this year. The conference, which brought together 250 people from a wide range of backgrounds, was hugely successful. A conference on Coastal and Lakeside Subdivision will be held in July 2004 in association with NZCS.

EDS recently presented submissions to Jo Rosier, reviewer of the New Zealand Coastal Policy Statement, and next year will be carrying out a substantive piece of work on the Oceans Policy currently being developed by government.

Many local groups are very concerned about development and management of the New Zealand coastline but lack the resources to effectively participate in RMA processes.

Ongoing support for local environmental groups is provided by EDS through maintaining a web-based guide to the Resource Management Act (www.rmaguide.org.nz) and providing back up legal and professional help.

*Raewyn Peart, Senior Policy Analyst
Environmental Defence Society
www.eds.org.nz*



Figure 3: The picturesque Whangarei Heads. (EDS)

Editorial

With more than 20% of the current world population currently living within 30 km of the coast and three-quarters of the world population expected to reside in the coastal zone by 2025 the management of coastal areas is only growing in importance. In countries such as the small island nations of Tuvalu, the Maldives, Samoa, Tonga and Niue the percentage of population which reside near the coastal is often 100%.

The recent destruction ravaged on the islands of Tonga, Samoa and Niue by Cyclone Heta in early January of this year highlighted the fact that no matter how much time, energy and money is spent there is a limit to how much humans can manage the sea.

On January 6 the path of Cyclone Heta took her directly across the island nation of Niue. Although she lashed winds gusting up to 200 kilometres on the island the damage rent was more akin to a tsunami than a cyclone with monstrous waves wrecking havoc. Waves destroyed more than 100 homes, some located over 100 metres inland, and even the island's hospital perched on a 30 metre cliff. Over half of the businesses in the capital, Alofi, were wiped out leaving a single store and one petrol station sufficiently intact to open their doors.

In addition to funding to help the island's 14,000 odd residents to rebuild their homes and businesses money will be allocated to allow coastal managers from New Zealand to establish if anything can be done to reduce such damage from future cyclone visits.

This is where conferences, such as the Annual Conference of the New Zealand Coastal Society, become invaluable. Such conferences allow coastal scientists, engineers and managers to avoid having to reinvent the wheel through sharing knowledge and finding out about projects such as the LOICZ (Land Ocean Interactions in the Coastal Zone) programme. So I hope we see you in Dunedin from 18-20 October 2004. To find out more visit www.coastalsociety.org.nz and follow the link on the front page.

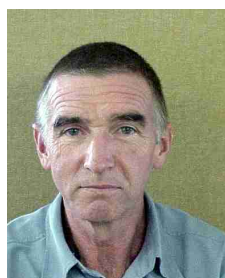
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**Coastal
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Profile – Gary Clode

NZCS Hawke's Bay Regional Co-ordinator



Gary Clode manages the engineering section of the Hawke's Bay Regional Council. The position involves dealing with a range of projects and council activities. These include flood risk assessment, flood forecasting and

hydrological flow management, flood and river control works and of course the coastal processes and Westshore coastal works. Gary is also responsible for providing advice to the Council's consent section over a wide range of issues and is involved in statutory advocacy and planning issues.

Gary is a graduate of the Canterbury School of Engineering with interests in civil and structural engineering. Now a Chartered Professional Engineer, Gary describes himself as an Engenieur, a continental description he hopes will gain greater acceptance from other engineers and greater recognition for the profession.

After working several years as a consulting engineer Gary joined the Hawke's Bay Regional Council to specialise more in hydraulics and hydrology with expertise in hydrodynamic modelling.

Although relatively new to coastal management and coastal processes he is progressing on a great learning curve and enjoying the challenges that people and their interaction with the coast provide. Recent coastal issues the council is dealing with include the release of the Regional Coastal Hazard Assessment, a consent application to remove 50,000 cubic metres per annum of gravel from the foreshore, Westshore renourishment and the issues surrounding this controversial work.

In between work and family matters Gary has a passion for mountain biking and keeping fit while fishing (sea of course) fills in the remaining spare time.

To contact Gary you can email him at garyc@hbrc.govt.nz.



Protecting the Little Blue Penguin

The Charleston Waitakere Community Group has received a grant of \$1600 to protect a little blue penguin habitat from stoats and rats. With the grant the group purchased 50 stoat traps and materials for making tunnels. The little blue penguin nest, moult and breed all around the West Coast, however this group concentrate on private coastal land between Constant Bay and Nine Mile Beach.

The group has been working closely with the Department of Conservation and hoped to attract a postgraduate student to look at the Charleston area, to get basic data, and see if stoat trapping had been effective.

*NZ Landcare Trust, Landcare Briefs,
October 2003*

Freak Waves

Ships are far more at peril from monster ocean waves than many experts have previously realised, according to new research. During a three-week radar satellite study, the German Aerospace Centre found a total of 10 monster waves around the world, ranging from 26 m to 30 m in height. It concluded: "If the satellite data is right, it looks as if freak waves occur in the deep ocean far more frequently than the traditional linear model would predict."

The research was supported by the Schrödinger equation, from quantum physics, which showed it was theoretically possible for an unstable, rogue wave to form anywhere in the oceans by absorbing energy from adjoining waves. Growing evidence that waves of more than 30 m in height can occur randomly could increase the chances of ship owners in defending cargo claims. However, shipowners attempting to defend rogue wave damage claims will need to show that structural maintenance has been carried out properly and carefully.

Lloyds List, Tuesday December 2 2003

Marakopa Estuary - Effects of Fishing and Recreational Vessels

Concerns have been raised relating to the adequacy of bylaws regulating boat movements to provide adequate protection for:

- (a) the coastal sandspit on the western side of the Marakopa Estuary, which is a wahi tapu containing urupa and other koiwi, and
- (b) the estuarine kaimoana/pipi beds inside the sandspit.

Speeding watercraft - both fishing boats and smaller recreational craft such as jet skis - were seen as causing erosion of the sandspit on the estuary side and a decline in the pipi. Advice was provided to the PCE correspondent relating to

the role of iwi environmental management plans under the RMA and the role of Environment Waikato in the development, implementation and review of coastal plans.

*Parliamentary Commissioner for the Environment,
www.pce.govt.nz*

Holey boulders - work on wave wall to start

The 2-3 tonne monster boulders being delivered to Dunedin's St Clair Beach this week have an unusual feature - each has a sizeable hole drilled through its middle.

The boulders are destined to become a wave deflecting wall on the seaward side of the St Clair Hot Salt Water Pool. The wall is part of the Dunedin City Council's \$6.06 million St Clair upgrade project. Over the next few weeks, holes would be drilled in the rocky outcrop beside the pool. The boulders would be placed in position one at a time, using a 20-tonne excavator, and steel rods and grout used to anchor them into the rock. Once the rods had been topped with a nut, the holes would be filled in and smoothed over. About 50 boulders would be laid, with 60 cm gaps between them.

ODT, Thursday, 27 November 2003

Oil tanker grounding preparedness in Whangarei Harbour

Earlier this year there were two oil tanker groundings on the way into Whangarei Harbour, and a concern was raised as to whether current management systems were adequate. Enquiries found that the two bodies responsible for managing oil tanker safety, Northland Regional Council and the Maritime Safety Authority (MSA), have been working to improve systems to prevent another grounding, including making changes to harbour entry practices for oil tankers, and the purchase by NRC of sophisticated equipment to monitor swell conditions.

MSA is currently developing a National Port and Harbour Safety System, which will lead to the development of National Port and Harbour Marine Safety Code and Guidelines of Good Practice.

*Parliamentary Commissioner for the Environment,
www.pce.govt.nz*

Fiji law not precedent for NZ

The New Zealand Government does not consider pending changes to Fiji's foreshore and seabed ownership sets a precedent this country should follow.

Fiji is to change the law this year, transferring ownership of coastal areas from the state to indigenous Fijian tribes.

Fiji's government said it was "right" that local

tribes should get the direct economic benefit from the use of their beaches, seas and reefs by thousands of international holiday makers every year.

The legislation would not interfere with the right of access to the foreshore, but the meaning of 'public access' would have to be defined.

Major hotels and resorts mostly sit on leased native land but often expect virtually exclusive use of beaches and sea areas in front of their buildings.

The tourism industry has already voiced concerns, with operators fearing the new owners could block the use of lagoons, reefs and beaches, or demand payment for access.

The move contrasts with the NZ Government's decision announced last month to change the law here to ensure coastal areas are owned in the 'public domain' by all New Zealanders, effectively extinguishing the right of Maori to claim freehold title to the seabed and foreshore.

ODT, Saturday, 3 January 2004

Indicators For Integrated Coastal Area Management

"A Reference Guide on the Use of Indicators for Integrated Coastal Management" has been published UNESCO's IOC/ICAM. The aim of the Guide is to present a literature review on the use of indicators around the world, from various programmes and projects, at global, regional, national and local scale. The Guide is available at <http://ioc.unesco.org/icam/files/Dossier.pdf>.

PCE case study into the use of community plans as a means of addressing coastal pressures at Whangamata

Whangamata faces environmental concerns similar to many other popular coastal areas. The PCE is assessing the role and effectiveness of a locally instigated community planning exercise that attempts to address these concerns, primarily, declining harbour water quality, upgrading of sewage treatment, recreational conflicts and pressures from ongoing urban development.

Parliamentary Commissioner for the Environment, www.pce.govt.nz

Sandspit secured

The Government has bought a \$90,000 section of sandspit near Westport to help protect a coastal and estuarine environment for seabirds, and for Maori heritage.

Close to 24 ha of coastal and estuarine dunelands at Okari Spit, Nine Mile Beach, were purchased from Westport farmers George and Jennifer Brownlee by the Government's Nature Heritage Fund, fund chairwoman person Di Lucas said in a statement.

"With this purchase, Okari Spit is now fully protected, bringing the area of Department of

Conservation reserve land in the area to more than 100ha."

ODT, Tuesday, 6 January 2004

Line in the mud drawn for mangroves

Environment Bay of Plenty has drawn a line in the mud beyond which mangroves growing around Tauranga will not be allowed to encroach.

The council has ruled on a bitter dispute in which pro-mangrove ecologists were at loggerheads with residents who viewed the plant as a rapidly expanding blot on their estuary views. The decision favoured a compromise by Tauranga District Council to restrict the mangroves to the existing mature habitat which rings large areas of the city's harbour margins.

The ruling follows a hearing late last year when Environment Bay of Plenty heard arguments ranging from the almost complete eradication of mangroves to allowing them to colonise to the full extent of their natural range.

The conservation line settled on by Environment Bay of Plenty depicts where mature mangroves had reached by 2002. Beyond this line the plants can be removed by hand or cut off but only at officially sanctioned work days supervised by council staff.

The decision was said to recognise the importance of mangroves in the environment while blaming their population explosion on the build up of sediment washed down from subdivisions and other land use.

The two year consent allowing the council to manage the mangroves has set a precedent for communities around New Zealand with spreading mangrove issues.

Barring appeals, TDC will be able to commence organising community work days to eliminate mangroves colonising the estuaries outside the designated preservation zones.

Environment Bay of Plenty has asked the council to monitor the impact of the removal of mangroves on wading birds and to erect signs educating the public about the value of mangroves in the protected areas.

Bay of Plenty Times, Saturday, 17 January, 2004



Photo: BECA

**Coastal
News**



New Zealand Researchers Investigate Coastal Processes and Geomorphology of Coral Reef Islands in the Maldives

Coastal News



Atoll islands, such as Thiladhoo, in the Maldives, are little more than low-lying accumulations of reef-derived sediment deposited by wave and current processes on coral reef platforms. These islands rarely exceed 3m above mean sea level and comprise the only habitable land in atoll nations such as the Maldives, Tuvalu and Kiribati.

Atoll islands are morphologically sensitive, changing in size, shape and position on reef platforms, to short-term changes in climate such as storms and seasonal shifts in monsoons. They are also susceptible to long-term climatic changes that control island building processes.

It is this rapid morphological adjustment of islands to short-term climatic variability, together with their small size and low elevation, that has focussed international attention on the extreme vulnerability of atoll islands to longer-term adjustments in oceanic and climatic boundary conditions including sea-level rise and wave action. Underlying such concerns is the knowledge that these boundary conditions are critical in determining the location, formation and morphological change of atoll islands.

Paradoxically, given the sensitivity of islands to climate variability and change no robust model of atoll island dynamics exists, which allows projections of the likely response of islands to changes in boundary conditions.

This lack in understanding of atoll island behaviour creates a significant barrier to predicting future island responses to changing boundary conditions and as a basis for sound environmental management of physical resources of islands.

Confronting this gap in understanding has been the focus of a Marsden Fund Research Grant awarded to Paul Kench from the School of Geography and Environmental Studies at the University of Auckland. The research has been undertaken in collaboration with Scott Nichol (University of Auckland), Kevin Parnell (ex-Auckland and now James Cook University, Townsville), Rob Brander (ex-Victoria and currently at the University of New South Wales) and Roger McLean (UNSW); and in partnership with the Environment Research Centre, Government of Maldives.

The main objective of the project is to quantify how boundary conditions (wind and oceanic swell) control coral reef processes (wave, current and sediment transport processes) and subsequent reef island formation and change. The project is being implemented in the Maldives archipelago approximately 500km off the bottom off the Indian continent. The Republic of Maldives comprises 22 atolls, and more than 1500 low-lying reef islands, that straddle the equator in the central Indian Ocean (Figure 1).

The Maldivian archipelago experiences seasonal shifts in monsoon winds (southwest to northeast) and therefore, is an ideal natural laboratory to study the effects of predictable shifts in climate on reef processes and island morphological change. The focus of the study includes nine islands located in the South Maalhosmadulu atoll (Figure 1). The islands are situated along a west to east transect allowing the effect of relative exposure of oceanic waves and monsoon winds to be evaluated.

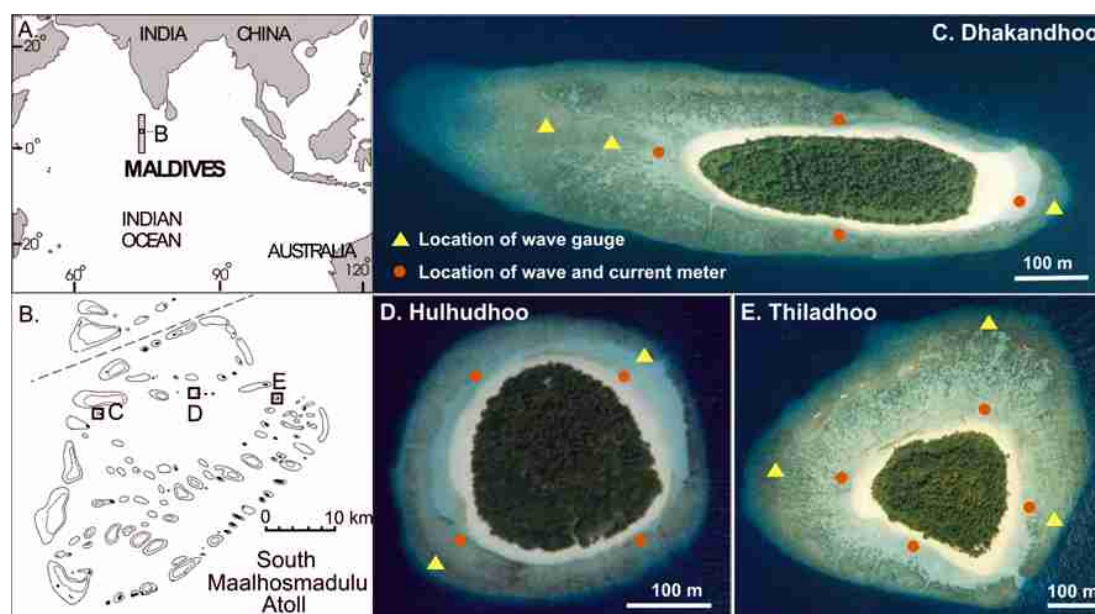


Figure 1: Location of study islands in South Maalhosmadulu Atoll, Republic of Maldives. C, D and E show islands chosen for detailed process measurements in June 2002 and February 2003.



Figure 2: The Research team on Thiladhoo Island. Left to right: Rob Brander (UNSW), Roger McLean (UNSW), Scott Nichol (UoA), Paul Kench (UoA), Kevin Parnell (JCU).

In the first study of its kind synchronous measurements of reef platform processes (waves, tidal currents and sediment transport) and morphology (platform shape and beach topography) were obtained to document the relationships between island morphological change and processes. Monitoring of island morphology began in January 2002. Detailed process measurements on three islands were undertaken in June 2002 and February 2003 in order to document the effect of the southwest and northeast monsoons on reef platform processes and ultimately island change.

The goal is for the results of the investigation to provide the building blocks for a morphodynamic model of reef islands and provide the basis for predicting how reef islands will respond to changing climate and sea level.

Significantly, the project has established the first systematic monitoring project of atoll islands that will yield quantitative information to support assertions as to whether, or not, atoll islands are eroding. Some preliminary results were presented at the recent Coasts and Ports Conference in Auckland.

Paul Kench is also involved in similar research projects in the Pacific and the Great Barrier Reef. He also has a number of postgraduate students actively involved in field-based research projects in the Maldives, Fiji and Great Barrier Reef, dealing with reef hydrodynamics, sedimentation and coastal morphodynamics.

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School of Geography & Environmental Science,
University of Auckland
p.kench@auckland.ac.nz*



Figure 3: The research team with members of the Maldivian Environment Research Centre in transit to Hulhudhoo Island.



Seaweek 2004

7-14 March

The theme for this year's Seaweek is

**Our amazing marine life - let's
protect it!**

Seaweek is organised by the New Zealand Association for Environmental Education (NZAAEE) in conjunction with the Marine Education Society of Aotearoa (MESA).

To find out about coordinators and events in your area
visit www.nzaaee.org.nz/seaweek/index.html

News From The Regions

Northland Region

by Rick Stolwerk, NZCS Northland Area Coordinator

Aquaculture Marine Areas Cause Fiery Response

The Northland Regional Council is currently going through the community consultation process on the location of a few sensitive issues including Aquaculture Marine Areas and boat ramp access. Unfortunately poor communication and misinformation on the part of all parties concerned has resulted in a number of fiery public meetings. The proposed location of the AMAs does seem to defy reasoned thinking but hopefully common sense will win in the end.

Whangarei Coastal Management Strategy Completed

In November 2003 the Whangarei District Council completed its Whangarei Coastal Management Strategy after a lengthy community consultation process, including the development of 11 Structure Plans for high priority planning areas over the next 20 years. The overall vision for the CMS is "Our Unique Subtropical Coastal Environment: Nurturing a wealth of opportunities to experience, to treasure and harness our prosperity". Although the process appears to be a logical one there are still a good number of the general public who have difficulty understanding what this means to the future of their coastal area.

Beach Renourishment at Matapouri

The first of several planned beach renourishment programmes has been completed at Matapouri Bay. The foredune has been reshaped to form a natural sand dune with the addition of 11,000 pingao plants to stabilise the sand works. Hopefully the improvement of other priority erosion areas along the coast will soon follow.

Bay of Plenty

by Tom Fitzgerald, NZCS Bay of Plenty Area Coordinator

Controversy At One Of New Zealand's Most Popular Holiday Destinations

The deserted beachscapes of the winter months seem otherworldly as the population of the narrow tombolo swells to almost bursting point during the summer migration at Mount Maunganui. But behind the relaxed holiday atmosphere façade lurk controversy and tension.

Tauranga District Council

(TDC) has recently been both the applicant for resource consent, and the consenting authority for two cases concerning the "utility" aspect of Mount Maunganui's Main Beach. In both cases the unforeseen 'sand trap' was the coastal hazard provisions of the Tauranga District Plan, made operative in July 2003.

As part of the ongoing development of the Mauao-Mount Maunganui Main Beach area, and the implementation of its Reserve Management Plan prepared in 1998, TDC applied for and was granted resource consent to extend the existing boardwalk facility. The purpose of the boardwalk is to provide access for pedestrians to Mauao whilst ensuring a buffer is maintained against coastal erosion. However, the construction will require the removal of the front row of campsites from the popular public campground at the base of Mauao (Figure 1). Understandably, long time campers are somewhat aggrieved by this decision, and in particular a perceived lack of consultation during the development of the Reserve Management Plan. Some of these campers have been on a waiting list for over 50 years to secure a front row spot!

The second issue was also one with a relatively long history. Sporting events and carnivals have been held on the wide sandy berm of the Mount Main Beach for over 20 years. These temporary events (including international surf lifesaving and beach volleyball) have become major events with large participation and spectator numbers, significant economic spin-offs and even television coverage.

TDC recently lodged a publicly notified resource consent that sought to legalise the duration of the events and erect temporary grandstands to accommodate the large number of spectators. Numerous submissions were received in opposition, including those that identified the grandstands as 'structures' and were, therefore,



Figure 1: A view of the Mount Maunganui Main Beach and the campground located at the base of Mauao. (Opus)



prohibited in terms of the District Plan's coastal hazard regulations. This has sparked an intense public debate as to the public utility of the beach versus the enjoyment of the idyllic beachscape by local residents.

Hawke's Bay Region

by Gary Clode, NZCS Hawke's Bay Area Coordinator

Renourishment Contract Hampers Beach Access

The annual Westshore Beach nourishment contract was completed by Walmsley Contracting Ltd for \$86,616 in time for the summer break. However, there are now concerns to do with access to the beach. These arise due to the relatively steep nature of the beach profile after the completion of the contract resulting in difficulty for some to walk to the beach.

Regional Council Continues Coastal Management Studies

The long awaited Hawke's Bay coastal hazard study for the Hawke's Bay Regional Council has now been completed and peer reviewed. The study was carried out by R. Reinen-Hamill of Tonkin and Taylor. The report will be released to the public in February.

The Hawke's Bay Regional Council is also continuing to work with the Port of Napier Ltd and the Napier City Council on common coastal issues. Dr Paul Komar, a consulting oceanographer from the USA has been providing advice and peer reviews and is scheduled for a return visit to the Bay during the Art Deco weekend in February to enjoy the festivities as well as to discuss and advise on the issues he has been asked to deal with.

A Thought: Leadership and the Brain's Design

No creature can fly with just one wing. Gifted leadership occurs when the heart and the head - feeling and thought - meet. These are the two wings that allow a leader to soar. All leaders need enough intellect to grasp the specifics of the task and challenges at hand.

Of course, leaders gifted in the decisive clarity that analytic and conceptual thinking allow certainly add value.

We see intellect and clear thinking largely as the characteristics that get somebody in the leadership door. Without those fundamental abilities, no

entry is allowed. However, intellect alone will not make a leader; leaders execute a vision by motivating, guiding, inspiring, listening, persuading and, most crucially, through creating resonance.

As Albert Einstein cautioned, "We should take care not to make intellect our god. It has, of course, powerful muscles, but no personality. It cannot lead, it can only serve."

The New Leaders - Transforming the Art of Leadership into the Science of Results, by D Goleman, R Boyatzis and A McKee, 2002.

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NZCS Regional Co-ordinators

Every region in the country now 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	Rick Stolwerk	stolwerk@xtra.co.nz or rick@waipumuseum.co
Auckland	Matt Paterson	matthew.paterson@aucklandcity.govt.nz
Waikato	Bronwen Gibberd	bronwen.gibberd@ew.govt.nz
Bay of Plenty	Tom Fitzgerald	tomf@envbop.govt.nz or fitztom9@hotmail.com
Hawkes Bay	Gary Clode	garyc@hbrc.govt.nz
Taranaki	Peter Atkinson	dwk.newplymouth@duffillwatts.com
Manawatu/Wanganui	Jo Rosier	d.j.rosier@massey.ac.nz
Wellington	David Kennedy	david.kennedy@vuw.ac.nz

South Island

Upper South Island	Eric Verstappen	eric@tdc.govt.nz
Canterbury	Justin Cope	justin.cope@ecan.govt.nz
Southland/Otago	Mike Hilton Paul Pope	mjh@geography.otago.ac.nz ppope@dcc.govt.nz

Committee Member Profile: *Megan Linwood*



Megan Linwood, who recently joined the committee for the NZCS at the end of 2003, is a senior adviser at the Ministry for the Environment. She has been working at the Ministry for the past 6 years in the field of environmental monitoring and reporting. Her main

area of interest in this role has been the development of tools for reporting on the state of the environment, in particular the development of a classification system for the New Zealand marine environment.

She has also been working on freshwater reporting and the development of indicators for reporting on Maori values for the environment.

Prior to this, after a brief stint in environmental consulting, Megan's enthusiasm to work in a more marine focused area saw her join the marine pollution team at the Maritime Safety Authority. This career move was more in keeping with her studies in Marine Sciences at Otago University where she graduated with a Masters degree.

It's not all work though, summer for Megan involves a lot of quality time at the beach, swimming, snorkelling, and diving. And Wellington's hills provide plenty of mountain biking challenges.

Megan's contact details are:

Ministry for the Environment
PO Box 10 362,
Wellington

e-mail: megan.linwood@mfe.govt.nz
phone: 04 917 7511

Coastal
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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 2004 scholarship includes travel expenses of up to \$500 and registration to the NZCS Annual Conference being held in Dunedin 18-20 October 2004.

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, e-mail);
- 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 attend the conference;
- the applicant's supervisor's signature.

The successful applicants may be asked to present a short paper on their research at the annual conference.

The goals of the NZCS and membership forms can be found on the NZCS website.

Applications for the scholarship close on 30 May 2004.

Please send applications to:

Alex Eagles
New Zealand Coastal Society
1287 Ohauti Rd
RD 3
TAURANGA.

For additional information, contact Alex by e-mail at penguins@clear.net.nz.

NZCS Mission Statement

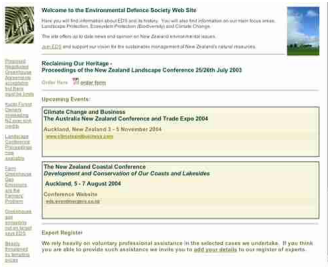
The New Zealand Coastal Society was inaugurated in 1992 "to promote and advance sustainable management of the coastal environment.

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)

What's Hot on the Web...



UNESCO Environment & Development in Coastal Regions & Small Islands

www.unesco.org/csi/pub/source/ero15.htm

This weblink will take you to an extensive index to everything you could possibly want to know about the United Nations projects, known as CSI.

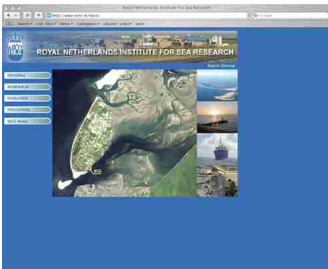
The main goal of CSI is the mitigation and management of conflicts over coastal resources and values. The projects are designed to help small island and other third world nations protect their coastal regions through environmentally sound, socially equitable, culturally respectful and economically viable development.

Environmental Defence Society

www.eds.org.nz/

The EDS is a New Zealand based environmental advocacy organisation concerned with landscape protection, including coastal management; biodiversity; and climate change

The Society pursues its aims through proactive policy development, advocacy and involvement in selected planning cases ensuring that environmental decisions are made properly. Although the EDS is primarily concerned with the New Zealand environment it will act in South Pacific nations on like matters, with local partners.



LOICZ - Land-Ocean Interactions in the Coastal Zone

www.nioz.nl/loicz/

LOICZ is one of six core International Geosphere-Biosphere Programmes. LOICZ has made major advances in our understanding of the biogeochemical and the physical role of the coastal zone in global cycles and change, by addressing questions such as 'How do changes in land use, climate and sea level alter the fluxes and retention of water and particulate matter in the coastal zone and affect coastal morphodynamics?'

Future LOICZ projects aim to focus on key issues concerning human uses of the coastal zone (including changes in hydrology on global scales, the increase in fluxes of substances and in some cases a decrease (due to damming in river catchments) all affecting the coastal ecosystem).



International Geosphere-Biosphere Programme (Global Change) New Zealand National Committee

www.rsnz.govt.nz/advisory/igbp/index.php

This committee was established in 1989 to enable New Zealand scientists to participate in the IGBP's international scientific programme to study human impacts on the earth's physical, chemical and biological environment.



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Seeking contributions to *Coastal News*

Your contributions to *Coastal News* keep Society members and the coastal community informed about coastal issues. Contributions can be advertisements for conferences or workshops, short news items or longer articles. We prefer articles of a maximum of 400 words (about 1-page in the newsletter), preferably with pictures or diagrams. Submit articles to Alex Eagles, Editor, *Coastal News* (e-mail: penguins@clear.net.nz).

Conferences/Workshops

Coastal News



IPENZ Offers Courses for NZCS Members

The Institute of Professional Engineers of New Zealand (IPENZ) is now offering tailor made and existing professional development opportunities for interested people associated with the engineering profession. The courses will be run on a fee recovery basis and with the minimum number of participants will cost \$495 for one day or \$795 for two days. Course learning outcomes would be linked to the appropriate elements of the IPENZ Competence Standards and contribute to the Continued Professional Development (CPD) records. Courses scheduled to run in 2004 include 'Project Management Case Studies', 'Risk Management', etc.

For further information visit www.ipenz.org.nz or contact Sharon Wagg, Knowledge Services Manager, IPENZ, 04 473 2022 or swagg@ipenz.org.nz.

Coast to Coast 2004 – Australia's National Coastal Conference

19-23 April, 2004, Hobart, Tasmania

Although huge progress has been made in integrated coastal zone management there are greater pressures on our coasts now than 10 years ago, and new directions and solutions are needed. As a result the 2004 ANCC will focus on quality planning and management of the coastal and marine areas such as:

- Natural resource management across the catchment-coast-ocean continuum
- Adapting to climate change
- Sustainability and the coast
- Inspiring and supporting community participation
- Understanding and integrating indigenous issues
- Planning and management in our marine areas
- Sustainable coastal tourism and recreation.

For more information go to:

www.cdesign.com.au/coast2coast2004

Managing Coastal Hazards—Natural Hazards Centre Short Course

4-5 May, 2004, Hamilton, New Zealand

The NIWA/GNS Natural Hazards Centre is presenting four short courses this year on natural hazards covering coastal, earthquake, flooding and volcano hazards, filling a gap between conferences and university courses. The coastal hazards short-course will cover topics such as: storm-tides, wave climate, tsunami, sandy coasts & inlets, cliffed coasts, coastal hazard zones, coastal mitigation, risk assessment, climate-change, and social aspects. It is aimed at arming coastal resource managers, planners and emergency managers with the latest information on coastal hazards to assist them in reducing or managing the risk to local communities. Main tutors will be Terry Hume, Willem de Lange, Richard Gorman, Jim Dahm and Rob Bell. The

course will be held at NIWA Hamilton offices and is strictly limited to around 20+ registrants.

For more details check the website (www.naturalhazards.net.nz/courses) or contact Rob Bell at r.bell@niwa.co.nz.

International Conference on Hydrosience and Engineering 2004

30 May – 3 June 3, 2004, Cairns, Australia

The 6th ICHE focuses on the interactions between coastal aquifers and the ocean/estuaries, covering a wide range of topics including saltwater intrusion, contaminant transport and reactions in coastal aquifers, submarine groundwater discharge and associated chemical fluxes to coastal waters, and propagation of oceanic oscillations in coastal aquifers. All papers featuring analytical and numerical modelling, laboratory and field experiments and case studies are welcome.

Visit www.ncche.olemiss.edu/iche2004/ for more information.

8th National Conference on Hydraulics in Water Engineering

13-16 July, 2004, Gold Coast, Queensland, Australia

The Institution of Engineers conference will provide a forum for reporting and discussion on design challenges and solutions, environmental issues, sustainability, risk management, and the latest research in hydraulics. All those with an interest in water engineering hydraulics are invited to attend and consider submitting a paper for review.

For updates on the conference you can visit www.orgaus.com.au/hydraulics.

Coastal and Lakeside Subdivision Conference

30 and 31 July 2004, Auckland, New Zealand

This conference, hosted by the Environmental Defence Society, will feature the topics:

- Sustainable development
- Coastal subdivision – where and where not to do it
- Coastal and lakeside subdivision, examples of best practice
- Development pressures
- Policy and framework
- Working within existing frameworks
- Improvements to policy
- Review of NZCPS and Oceans Policy

For further information see www.eds.org.nz.

6th NZ Natural Hazards Management Conference 2004

10-11 August, 2004, Tauranga, New Zealand

The 6th conference in this biennial series on managing natural hazards has as its theme this year "Interpreting and applying natural hazard information". This forum will offer the first major opportunity to discuss this topic following the

development of regional CDEM Group Plans under the new CDEM Act. The conference is aimed at emergency managers, planners, risk assessors, utility/network managers, consulting engineers and researchers. The entire range of natural hazards will be covered through keynote addresses, case studies, formal presentations and poster sessions, along with several pre-conference short courses. For further information visit www.naturalhazards.net.nz/conference or contact Diane Tilyard at d.tilyard@gns.cri.nz.

Coastal Zone Asia Pacific Conference

5-9 September, 2004, Brisbane, Australia

The 2004 Coastal Zone Asia Pacific conference is currently calling for oral and poster presentations, due by 1 April 2004, with the theme "Improving the quality of life in coastal areas". The focus is on short presentations to provide stimulus for discussion of key findings and future actions – an action oriented conference with maximum participation. Each concurrent session is expected to have four to six talks of five minutes duration each, followed by facilitated discussion that focuses on key learnings and actions.

Conference sessions will include:

- poverty and sustainable livelihoods
- ecosystem management
- community participation
- resource economics
- integrated coastal management
- and coastal communities and cultures.

For details on how to submit abstracts, register interest and view past scientific papers, visit or contact Don Alcock, Communication Manager, Coastal CRC, don.alcock@nrm.qld.gov.au

Restore America's Estuaries

12-15 September, 2004, Seattle, Washington

The second national gathering of the coastal and estuarine habitat restoration community are inviting submissions for presentations and posters.

The conference themes will include:

- People - How to engage community involvement at all stages of restoration, from planning to implementation and evaluation, and restoration and environmental education.
- Practice - Habitat restoration techniques in a range of coastal and estuarine areas such as sea grass beds, oyster reefs, salt marshes, mud flats, mangroves, kelp beds, open waters and rocky shores.
- Science - Applying the latest scientific advances in understanding healthy coasts and estuaries to the planning, practice and politics of restoration.
- Strategy - The best practices in restoration planning at any scale and how to take restoration to the next level regionally and nationally.
- Policy and Funding - How to improve the climate for restoration locally, regionally or nationally, creative ways to fund your restoration effort, and creating the political will to secure the future of restoration.

- Evaluation - Methods for monitoring and evaluating to determine project success.

To submit a presentation or poster for consideration, complete and return the form (www.estuaries.org/objects/2004RAEFCFP.pdf).

For more information visit or contact Steve Emmett-Mattox at Restore America's Estuaries sem@estuaries.org.

International Conference on Coastal Engineering 2004

19-24 September, 2004, Lisbon, Portugal

The ICCE is inviting original papers on the following topics:

- Coastal processes and climate change.
- Flood and coastal defence engineering and management.
- Flood risk management.
- Coastal environment.
- Ports and harbours.
- Coastal legislation, planning and co-operation.

For more information contact icce2004@nec.pt or go to www.icce2004.org

Civil Engineering in the Oceans VI

20-22 October, 2004, Baltimore, MD, USA

Civil Engineering in the Oceans VI (CEO6) will be a multidisciplinary technical conference for engineers and scientists concerned with civil engineering in the oceans. The conference, sponsored by the American Society of Civil Engineers and the Coasts, Oceans, Ports, and Rivers Institute (COPRI), aims to serve as a comprehensive guide on state-of-the-art ocean and offshore engineering.

Topics will include:

- Ocean Environment
- Hydrodynamics
- Waves and Wave Forces
- Coastal and Offshore Structures
- Marine Geotechnical Engineering
- Marine Transportation Systems
- Deep Draft Channel Design
- Ocean Energy
- Risk and Reliability
- Education

Abstracts are due by March 26, 2004. For more information visit or contact Dr Michael J Briggs at michael.j.briggs@erdc.usace.army.mil or Prof. Michael E McCormick at memccormick@jhu.edu.

Survival Skills For Managing Coastal Resources

A six-part Coastal Management Framework module has been designed to provide an understanding of the many players involved in coastal zone management and their roles in the decision-making process. The module is available at: www.csc.noaa.gov/cmfp/admin/welcome.htm.

**Coastal
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Communities Caring For The Coast

YHA Young Conservationist Awards

Coastal News



In accordance with their mission statement "...to encourage all people to better understand each other and the environment" the Youth Hostel Association (YHA) New Zealand run the YHA Young Conservationist Awards each year.

The 2003 awards, which were sponsored in partnership with the Department of Conservation, included two prizes awarded for coastal projects.

The 2003 Tui Individual Primary/Intermediate Award was given to John Sunley, a Year 8 Student at Queen Charlotte College, for his ongoing research into the risk of *Didemnum vexillum*, commonly known as the sea squirt. John's project investigated the likelihood of the sea squirt species spreading in the Waikawa Bay Marina and surrounding Marlborough region.

In 2001 this invasive species was found in Shakespeare Bay, near Picton, with a similar species being detected in the Whangamata Harbour later that year. The species, which is highly invasive, smothers man made structures, posing potentially serious threats to, amongst other things, the mussel farming industry.

To assist with monitoring, reporting and documenting video footage on his research John designed and built a Remotely Operated Vehicle (ROV).

The information that John has collected will go to Biosecurity Scientists at the Cawthron Institute in Nelson for further analysis.

John's project was inspired by the fact that "the New Zealand marine environment supports some

of the richest, rarest and most distinctive wildlife habitats, many occurring nowhere else on earth. Covering an area 15 times the size of the landmass, it supports over 20,000 species. With this extraordinary richness of biodiversity comes our responsibility to protect it."

John's prize was a New Zealand Conservation Trip.

Sixteen-year-old James Kirkland was chosen as the winner of the 2003 Harakeke Individual Secondary Award for his contribution to the Wellesley College's Sand Dune Regeneration Project at Wellington's Days Bay.

A key component of James' project was community involvement, which James himself showed by volunteering over 50 hours to plant native trees in the area. James was involved in the construction of bollards and steps from recycled railway sleepers. He was also involved in building an accessible entrance for public access and a temporary windbreak.

While James was part of a larger community initiative, his contribution, commitment and support were recognised as an important aspect of this hands-on conservation project.

James received a trip for two to Australia's Grampians YHA Eco Hostel, Halls Gap, Victoria as his prize.

For information on how to enter the 2004 YHA Young Conservationist Awards visit the YHA website at www.stayyha.com or the Department of Conservation website at www.doc.govt.nz.



Photo: BECA

LOICZ — Managing Where the Land Meets the Ocean

Global change is today considered to be the most pressing and pervasive environmental problem of the 21st century. The International Council for Science (ICSU) has responded to this problem with an unprecedented research effort at the national, regional and global scales including the establishment of LOICZ (Land Ocean Interactions in the Coastal Zone).

Achieving global sustainability requires scientific knowledge about how the Earth works, and what we are doing to it. The growing recognition that global change is a reality has brought into sharp focus some fundamental questions about our planet. How does it function as a system? How robust is the Earth in the face of growing human-driven pressures? Are we in a transition to a new, stable 'state'? If so, what will be the climate of this new state? What will be the responses, and feedback, of the Earth's biosphere? How can, and should we return to the pre-industrial state of the Earth system? How can human societies - our industrial systems, institutions, cultures and values - respond to this challenge?

Acquiring the scientific understanding to answer these questions is well beyond the scope of individual countries and regions. It is also well beyond individual disciplines, and beyond the traditional divide between the natural and the social sciences. Gaining the knowledge base needed to underpin the transition to global sustainability demands an unprecedented international and interdisciplinary scientific research effort.

The International Geosphere-Biosphere Programme (IGBP) was established by the ICSU in 1986 to help meet this challenge. The objective of IGBP is to develop an international, integrative and interdisciplinary global change science to understand the interactive biological, chemical, geological and physical processes that define the dynamics of the Earth's life support systems. It also focuses on how humans impact and are supported by the system, and the policies and practices that will be required to ensure the sustainability of this system.

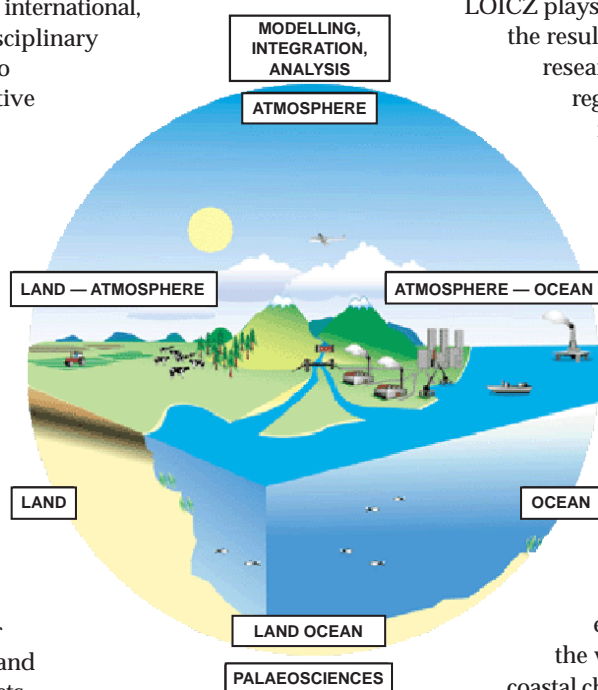
IGBP aims to add value to a large number of individual, national and regional research projects

through integrating activities to achieve enhanced scientific understanding by:

- developing common international frameworks for collaborative research based on agreed agendas;
- forming research networks to tackle focused scientific questions;
- promoting standardised methodologies;
- guiding and facilitating construction of global databases;
- undertaking model and data comparisons; and
- facilitating efficient patterns of resource allocation.

The LOICZ is the most recently established of the core IGBP projects set up to address the current limited understanding of regional and global changes that impact coastal systems.

The coastal zone of the Earth System is a dynamic area of natural change and of increasing human use. Coastal zones occupy less than 15% of the earth's land surface, yet accommodate between 20.6 and 37% of the world population in the bands of the nearest 30 km and 100 km respectively and roughly 50% i.e. 3.1 billion people in the 200 km range. With three-quarters of the world population expected to reside in the coastal zone by 2025, human activities originating from this small land area will impose an inordinate amount of pressures on the global system. As such it faces the challenge of maintaining the continuity of its goods and services for and of the ecosystem and human society.

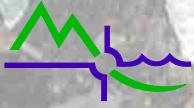


LOICZ plays a crucial role in relating the results from global system research to the regional/national scale and making them available to the stakeholders, for example, coastal zone managers. At the same time, through its extensive regional network, LOICZ aims to identify regional and national changes in the coastal system and integrate them at a global level to empower stakeholders the world over to tackle coastal change problems head on.

**Coastal
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Making Connections: Cross-boundary Coastal Management



The 2004 Annual Conference of the New Zealand Coastal Society

A Technical Group of the Institute of Professional Engineers of New Zealand

**18 - 20 October 2004
Dunedin**

Incorporating

A LOICZ* Workshop

(*Land-Ocean Interactions in the Coastal Zone)



in association with the
New Zealand IGBP* Committee
(*International Geosphere-Biosphere Programme)

'The Impact of Major Dams, Diversions and Water Abstraction on Coastal Sedimentation in New Zealand'

*The Conference Organising Committee look forward to extending the
special hospitality of southern New Zealand to conference delegates*

Conference Website: www.coastalsociety.org.nz (follow the link on the front page)

