



Coastal news

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Newsletter of the New Zealand Coastal Society

a Technical Group of IPENZ

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Seagrass Loss in the Bay of Plenty

Surveys by Environment BOP show a loss of seagrass in Tauranga and Ohiwa harbours in the last 40 years, and point to changes in catchment runoff as a contributing factor.

Within New Zealand there are at least two species of seagrass, *Zostera novazelandica*, an endemic species and *Z. capricorni*. Seagrasses are not true grasses but unlike most marine plants they are true flowering plants with stems, leaves, roots, and flowers. Seagrass plants produce pollen to fertilise flowers and produce seeds in the same manner as terrestrial plants. *Zostera* species occur worldwide in temperate zones and throughout New Zealand seagrass beds are commonly found in the intertidal and shallow subtidal parts of estuaries and shallow coastal waters with sandy or muddy bottoms.

Overseas seagrass ecosystems are known to be highly productive and are attributed with enhancing overall biological productivity and diversity. Beds reduce current velocities, capture fine sediment and stabilize the substrate. They increase habitat complexity providing a range of additional microhabitats, which many small animals utilize.

There have been widespread and large-scale declines of seagrass beds overseas. Natural processes, such as storms can damage seagrass beds, but they are particularly vulnerable to the impact of human activities. The main causes have been

attributed to eutrophication and sediment runoff. Increased nutrient levels from sewage outfalls and land runoff encourage the excessive growth of microscopic algae suspended in the water above the plants, or the overgrowth of epiphytic algae on the seagrass leaves. If enough algae grow, the sunlight needed for photosynthesis cannot penetrate to the seagrass, eventually causing the plants

to die. In a similar way suspended sediments sourced from land runoff and storm water can decrease water clarity and light transmittance, which reduces seagrass growth rates and the water depth to which they can grow. Substantial

losses can also arise from reclamation, dredging, oil spills, physical disturbance and introduced organisms.

Within New Zealand the state of these ecosystems and historic changes have been poorly documented. The following section presents the findings of Environment BOP's assessment of seagrass abundance within the Bay of Plenty.

Bay of Plenty surveys

A historical (1945/59) and recent (1996) assessment of seagrass cover was made from manual digital mapping (minimum scale of 1:10,000) of aerial photography for Tauranga Harbour and Ohiwa Harbour (see Table 1). Historic photography was black and white, while the 1996 photography was colour.

The mapping revealed substantial loss of seagrass





	1945	1959	1996	% Change
Tauranga – northern basin	-	2,046	1,849	-9.6
Tauranga – southern basin	-	2,392	1,084	-54.7
Ohiwa Harbour	120	-	88	-26.8

Table 1: Seagrass (ha) in Tauranga and Ohiwa Harbours

in both Tauranga and Ohiwa harbours between 1945/59 and 1996. The greatest loss occurred in the southern basin of Tauranga Harbour. A further breakdown of the data showed that the western sub-estuaries of the harbour had an even higher rate of loss (69%).

Factors associated with patterns of seagrass change

For Tauranga Harbour it was possible to test the association of changes in seagrass distribution with environmental variables such as average mud content of sediments within each sub-estuary and suspended sediment, DRP and NO_x loading coefficients. Correlations revealed one main link, which was the negative relationship between abundance in 1996, and the amount of suspended sediment load to the estuary each year. In addition, sediment mud content and nutrient loadings of phosphorous and nitrogen had reasonably strong links but were marginal in terms of statistical significance. These findings are consistent with visual observations in the sub-estuaries of Tauranga Harbour and the upper reaches of Ohiwa Harbour where the trend has been for disappearance of seagrass from the areas nearest river and stream inflows. Often these areas are now very muddy compared to other parts of the harbour. In Tauranga Harbour there was also a greater loss in the southern harbour, which has a proportionately larger catchment, inflows and more urban development. Other patterns to emerge from the data were a high loss of seagrass from subtidal environments.

The seagrass losses like those in the Bay of Plenty are seen in other places as well. Numerous bays and



estuaries on both the western and eastern side of Australia have suffered losses in the order of 50% or more. Within New Zealand extensive loss of seagrass has been noted in the Auckland area and the Avon-Heathcote Estuary. In the Avon-Heathcote Estuary, seagrass declined from 1920 until it had almost disappeared in 1952.

Our assessment of loss of seagrass for Tauranga and Ohiwa only covers the period 1945/59 –1996. There may have been considerable loss before this time, particularly in the sub-estuaries on the western side of the harbour. On a brighter note it appears that the decline in seagrass beds may be slowing as environmental practices improve. Decline in Tuapiro Estuary in northern Tauranga Harbour has reversed. The removal of point nutrient sources to the harbour and better management of land runoff and nutrients and suspended sediments has taken place in recent years.

Overall the evidence points strongly to sedimentation and eutrophication as having a major influence on the patterns of distribution and past/present losses of seagrass in Tauranga and Ohiwa Harbours. Monitoring changes over longer time periods (1959-96) has been useful in this respect. However, monitoring and analysis over shorter time is required particularly if seagrass is to be used as a national environmental performance indicator. Furthermore, as the dynamics of seagrass growth in New Zealand is still poorly known it is currently difficult to say what the most useful length of monitoring period should be. Areas of stressed and declining seagrass beds would obviously require more frequent monitoring than those in a healthy stable environment. There is an obvious need for more information, but some light may be on the horizon as a number of research projects are now starting to focus more on the interaction between the land and our estuaries and the changes that are taking place. In the mean time be careful that you are not currently losing a valuable component of your estuaries.

Stephen Park
Environment BOP

Classifying New Zealand's Estuaries and EEZ

Classification projects are underway in order to provide a framework for the assessment and management of New Zealand's estuarine and continental seas. The Estuarine Environment Classification (EEC) groups estuaries on the basis of their major controlling physical factors into domains of broadly similar physical and ecological properties and management implications. A complementary project, the Marine Environment Classification (MEC), is also underway.

Estuaries are difficult to define because they come in many shapes and sizes and are dynamic environments containing many different habitats. Confusing to the public is the fact that on maps they are named variously as: estuary, creek, firth, inlet, gulf, cove, river, bay, lagoon, harbour, stream, sound, port, arm and retreat. We use a broad working definition that covers the wide-range of situations that need to be managed, and define an estuary as: "A partially enclosed coastal body of water that is either permanently or periodically open to the sea in which the aquatic/ecology environment is affected by the physical and chemical characteristics

of both runoff from the land and inflow from the sea." Importantly this definition recognises the role of catchment and ocean forcings in determining estuary properties. As such it includes drowned river and tectonic valleys, barrier-enclosed tidal lagoons, coastal lagoons, tidal rivers, coastal embayments, structurally and tectonically influenced estuaries, and glacially excavated valleys or fjords.

New Zealand has as broad a range of estuaries as any country in the world. There are about 350

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Whangamoa River — a barrier-enclosed tidal lagoon

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New Zealand Coastal Society Annual Seminar 2001

The rumour is true – the NZ Coastal Society seminar will be held in Nelson this year, where glorious coastlines are to be found. Some of you may have fond memories of the area, but if you haven't visited lately or at all, this seminar will provide the perfect excuse to make amends! So put the following into your diary:

Date: 18-19 October 2001

Venue: Tahuna Beach Function Centre

Provisional Theme: "Between a Rock and a Hard Place"

The Society particularly encourages input from students and young practitioners to the seminar. So if you are currently studying or new to the business put your thinking caps on and send in a brief description of your paper, as well as contact details. The aim is that four papers will be selected to be presented, say 15-20 minutes, as a seminar session, with a prize awarded for the best paper.

The possibilities for the traditional excursion are endless and, if nothing else, will be memorable. Remember too that some liquids in coastal locations contain no salt! You may wish to stay on for the weekend and make the most of your visit. There is simply too much to see and do here in 2 days!

For further details, contact the Convenor: Eric Verstappen, Ph (03) 5443417 (bus), fax (03) 5447249, e-mail: eric.verstappen@tdc.govt.nz.

A Workshop on Marine Classification is being held in Nelson on the day prior to the NZCS seminar (Wednesday 17 October 2001).

New Zealand's estuaries and the EEZ are being classified. Funded by FRST and MfE, the classifications will provide a framework for the assessment and management of New Zealand's estuarine and continental seas (see article in this newsletter). The purpose of the workshop is to describe these projects and their applications and solicit feedback from management agencies, and scientists. Further details will be available early in August. Contact Terry Hume: t.hume@niwa.cri.nz



Mahurangi Harbour — a drowned river valley

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estuarine systems spread along 11,000 kilometres of open coast. The largest is Kaipara Harbour (74,000 ha), but most are less than 1,700 ha. The diversity of estuary types and habitats are a function of New Zealand's active margin and headland dominated coastal setting, diverse geologic past and catchment sediments, and variable wave climate and rainfall. The large number and variety of estuaries poses a wide range of issues and challenges for regional and territorial authorities that manage the coast.

Classifications are useful management tools because they distil complex ideas into simple pictures and standardise, or 'codify', our understanding so that we approach estuary management from the same fundamental understanding and point of view. Classifications are a general sense tool, and will not explain the details of cause and effect. Nor do classifications replace the need for detailed and site specific investigations in some cases.

A constraining issue in building a classification is the lack of data for New Zealand estuaries, particularly ecological data. To overcome this we chose to use an 'Environmental Factor' approach. This method uses data representing physical components of the environment (e.g., climate, tides, and geology) and produces hierarchical classification systems. It is based on the principle that physical components of the environment interact to 'drive' ecosystems. Drivers of the pelagic and benthic ecosystems in estuaries are: light, water mass, freshwater inputs, wind mixing of the water column, tidal mixing and stratification, flushing, and wind wave stirring of the seabed. Spatial and temporal variation in drivers is expected to be related to spatial and temporal patterns in ecosystem properties (such as biotic distribution), and capture broad patterns in the pelagic and benthic environment. The environmental factors are structured into a classification using a 'rule-based approach' to map estuarine systems on the basis of knowledge of the cause of differences in ecosystem structure.

For each estuary, a 'set of factors' was generated that represent, or are a proxy for, the drivers of the ecosystem. Factors are generated from data describing spatial variation in both environmental variables, including 'static' variables (e.g., bathymetry, catchment land cover and geology) and dynamic variables (e.g., wind, solar radiation, air temperature, runoff), and patterns in the physical environment that express the effect of drivers (e.g., modelled tidal data, modelled swell data). Models, coupled with GIS, were used extensively to generate variables and factors for both catchments and estuaries. The coastline was mapped using the New Zealand 1:50,000 Digital Topographic Database. Catchment boundaries were defined as polygons and derived from a NIWA database. Examples of factors generated for the EEC are tide range, mean annual runoff to an estuary, wind wave resuspension, and a rain power factor that describes the erosive strength of the rainfall and the generated runoff for a given catchment geology.

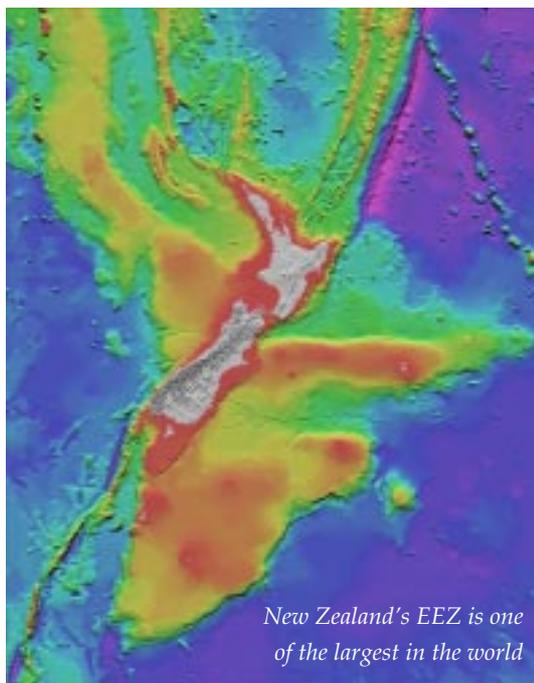
The end product of the work is not a 'static' classification. By linking the database with a classification engine (algorithms that operationalise rule-based decisions) management questions can be addressed. For instance, the system can be used to manage public expectation for water clarity in estuaries by identifying those estuaries where the water is likely to be turbid due to river inputs or wind wave stirring on the tidal flats. It can also be used to select representative estuaries for monitoring and selecting appropriate Environmental Performance Indicators. Unique habitats/environments such as estuaries of pristine quality can be identified and set aside for reserves. The database will provide a much-improved national picture of New Zealand's estuarine resources and the environment, and identify 'gaps' in our knowledge.

So far we have developed the factors to be incorporated into the database and built the database for the North Island estuaries. The South Island database will be completed next year and we will generate some trial classifications for all New Zealand estuaries.

A Marine Environment Classification has been designed to classify New Zealand's large EEZ. This covers an area of approximately 10.9 million km². The MEC is being approached in a slightly different way to the EEC, although the two classifications will be 'operationally seamless'. MEC classification will be carried out at two levels of resolution. First, a 'national scale' classification will be based on spatial coverage or 'factor layers' of environmental factors developed for a 1 km grid. This

relatively coarse grid will show limited detail in complex coastal areas like estuaries. A second and higher resolution 'regional scale' classification will cover the area from the shore to the inner continental shelf with 100-200 m cells. The MEC is being designed to capture broad patterns in environmental and ecosystem properties in the pelagic and benthic marine environments. The draft MEC design is based on 18 environmental factor layers, selected to represent spatial variation in large-scale physical process that 'drive' marine ecosystems. Extensive use will be made of numerical models and remotely sensed data (e.g., SST from satellite imagery) to develop factor layers. The factor layers will be mapped individually by 'linking' the data to the grid using GIS. Classifications will be made by 'combining' the factor layers using two types of 'classification procedure': rule-based and multivariate.

The MEC will evolve through (1) a test stage on a small data set, (2) collating physical and biological factor databases, (3) generating initial trial classifications and (4) final testing. The MEC regional classification complements the EEC approach by providing greater resolution in large estuaries containing many different environments.



New Zealand's EEZ is one of the largest in the world

The EEC is part of a NIWA programme called 'Effects of suspended sediment on coastal and estuarine ecosystems' that is funded by FRST (contract C01X0024). MfE is funding the MEC.

*Terry M Hume, Rick Liefting, Ton Snelder,
Murray Hicks, NIWA*

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Coastal Dune Vegetation Network Conference 2001 'Contrasting Coastlines'

In the last days of summer, when days were hot and sunny and nights were balmy, the annual meeting for the CDVN was held in Auckland at Macleans College, Eastern Beach. The conference theme 'Contrasting Coastlines' was used to highlight Auckland's diversity in coastlines and the array of dune and coastal vegetation management issues with which they are confronted. Over 3 days the conference consisted of a number of technical sessions and field trips revolving around this theme and a number of sub-themes on which invited guests gave presentations. The AGM was also held which provided a business session and an update on CDVN trials. The social evenings were most enjoyable, an informal BBQ at a lovely park on Eastern Beach and a scrumptious formal dinner overlooking Half Moon Bay Marina. Following the conference, an optional weekend field trip to see the coast care work being carried out on Great Barrier Island was a terrific way to finish the week.

Attendance over the 5 days was excellent, totalling around 170 people from all over New Zealand and

some from Australia. There were representatives from regional and district councils, local community groups (e.g., Coast and Beach Care groups), coastal private landholders, the forestry industry, the Department of Conservation, iwi, coastal consultants, educational institutes, staff from nurseries growing coastal plants and researchers from Forest Research.

Barbara Kendall enthralled us all with her formal welcome and opening speech about boardsailing experiences in various coastal localities around the world. Barbara stressed how lucky we are in NZ to still have a relatively unmodified, unpolluted coastline. The audience also got to feel Barbara's Olympic medals - a lovely treat. The keynote address by Dr Geoff Park set the scene for the conference on coastal vegetation issues. Dr Park, a researcher and writer on ecology and landscape history, works for Te Papa and gave an inspiring talk relating restoration of dune ecosystems today to the ecological history and past human impact on coastal sand dunes.

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Technical Sessions

Day one's technical session consisted of an introduction to the CDVN by Harley Spence. This was followed by various speakers from Auckland Regional Council, providing a great overview of the Auckland coastal region with talks contrasting the human impact issues on urban beaches in the east to BeachCare, dune reshaping and environmental factors in the west. Terry Hume provided the important geomorphological aspect as how the sand systems contrast in the east and west.

Day two's session focused on Coastcare and the community. Speakers from city and regional councils gave enlightening experiences of their involvement with Coastcare projects in their areas. Maureen Lander presented us with lovely slides and words on the Maori uses and weaving of pingao.

Day three's first session was well facilitated by Lachie Grant and gave us time for lively discussion at the end on the concept of foredune reshaping and results of CDVN trials on these foredunes. Speakers from various localities discussed the present situation at these trial sites that has resulted from reshaping and using variations in fertiliser and sand binding plants. The next session concentrated on backdunes, an area the CDVN will be researching in the near future. Speakers focused on biodiversity, Project Crimson and pohutukawa trials, interesting concepts behind backdune trials on the Coromandel and what is happening in the Franklin district.

Field Trips

Day one's field trip to Eastern Beach was a leisurely stroll from the conference venue down and along the length of this beach. Andrew Benson gave an overview on problems and management solutions that may happen at this urban modified coastal beach.

Day two's excursion highlighted the contrasting coastline theme starting with an enjoyable ferry ride with excellent commentary on the way by Graeme Murdoch on the modified estuary and harbour coastline. This was followed by a trip to Te Henga / Bethells Beach, an exposed unmodified west coast beach where work of the local BeachCare group and progress on a CDVN 'exposed sites' trial was discussed.

Day three concluded with a trip to the Regional Botanic Gardens. Steve Benham and Brent Torrens gave us an interesting tour and an overview of the garden programmes concentrating on the threatened coastal plants and coastal display. Mark Dean from Naturally Native NZ Ltd followed this with a

short session informing us on propagation of spinifex and pingao.

Great Barrier Island

This optional weekend field trip was a terrific opportunity and experience. After a bit of a bumpy ferry ride on Friday night, we all managed to locate our abodes and settle in. Saturday morning we met at Mulberry Grove School where we were wonderfully inspired by the projects the school has in place. Kids and teachers came to show us what makes their school special. We enjoyed papermaking, a beach clean up, potting native plants, seeing their worm farm, penguin boxes and compost and recycling systems. We then travelled in mini buses over to Medlands Beach on the East Coast.

After a delicious lunch at Alan and Grace Benson's place we were divided into groups and visited four stations along the beach. Each presenter talked about different aspects of the beach and exchanged views with participants. We looked at the vegetation today and historically and at a landscape management plan for the area.

We then travelled further north to beautiful Awana Beach. Here the BeachCare group led by Teresa

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Bethells Beach Field Trip – spot the people!



Bethells Beach Field Trip

CDVN AGM – 1st March 2001

The AGM was held in conjunction with the Contrasting Coastlines Conference in Auckland.

A number of significant issues regarding the direction and purpose of the Network were discussed, due to time constraints final decisions on these topics were directed to the Coordinating Committee. The suggestion for the Network to consider changing its name by dropping the word 'DUNE' from the title to allow research on other coastal environments was made. It was determined that the current name of the Network, its mission and objectives were still relevant and diverse enough to meet the current needs of the membership.

A brief summary of results from Network funded trials was presented. The projects currently ongoing and partially funded by the CDVN are:

- Spinifex propagation and establishment trials
- Spinifex phenology trials
- Dune fertiliser trials

- Difficult sites trials — exposed sites at:
 - (a) Santoft Beach, Rangitikei;
 - (b) Oakura Beach, New Plymouth;
 - (c) Te Henga / Bethells Beach, Auckland; and
 - (d) New Brighton Beach, Christchurch.

Good progress has been made on all trials over the last year with the first three trials due for completion this financial year, then allowing funding to be allocated to new projects voted upon by financial members, such as backdune studies. Full reports of these trials will be available at the end of the financial year from the CDVN team at Forest Research.

The business session concentrated on the focus and future direction of the Network and the annual conference and some new project ideas. Discussion was very general and ideas will be followed up at committee meetings.

For more information please contact:
greg.steward@forestresearch.co.nz

NZCS Committee Member Profile



Jo Fagan, BSc (Tech) Coastal Science and Hydrology, MSc (Resource and Environmental Planning), is a Policy Advisor with the Wellington Regional Council. She is involved in a wide variety of coastal work including working with Care groups, regional Seaweed co-ordination, Memorandums of Understanding with territorial authorities regarding coastal roles and responsibilities, and coastal oil spill emergency response co-ordination. She also co-ordinates regional plan implementation for the Council, which includes the Regional Coastal Plan.

Jo joined the NZCS committee in 1999, and was part of the team that co-ordinated the 1999 NZCS conference in Wellington. She is currently the assistant secretary for the Committee.

Jo is interested in partnerships with community groups, schools, businesses, government organisations and other stakeholders to improve community knowledge, attitudes and behaviours towards the coastal environment, streams and other common property environmental resources.

Global Perspectives on Coastal Management

In December 2000 I was awarded a Winston Churchill Memorial Fellowship to study strategies and techniques used in global coastal management, with a particular focus on sustainable management and the impacts on the local communities. From March to June 2001 I have travelled to the Eastern Seaboard of USA, UK and Gold Coast, Australia.

In New Zealand coastal environments are under increasing pressure from population growth and the resultant development along the coastline. Coastal communities, management agencies and scientists alike now understand the importance of sustainable management of these areas if we are to maintain the natural character of our precious coastline. The support by a national Trust for this type of research is evidence of the importance and value placed on our coastal environment.

An article with highlights of this research will be printed in the next issue of *Coastal News*.

A full report will be available on request.

Lucy Brake
Coast Care BOP Programme

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Conferences/Workshops

Waves 2001, 2-6 September 2001, San Francisco. The Fourth International Symposium on Ocean Wave Measurement and Analysis.

Professionals, researchers and all interested persons are welcome and encouraged to participate in an exchange of information and views geared to promote communication, technology transfer, improved design, and practical solutions as well as present case histories relating to wave measurement and analysis.

See <http://edge.tamu.edu/waves2001> for more information.

Coasts & Ports 2001, 25-28 September 2001, Surfers Paradise

Encompassing the 15th Australasian Coastal and Ocean Engineering Conference and the 8th Australasian Port and Harbour Conference.

International and local keynote speakers will discuss not only technical advances but also trends and current directions in coastal management and port development. The program will provide a unique blend of management and technical sessions in an atmosphere that enhances interaction and effective networking.

See <http://www.icms.com.au/coastsandports> for more information.

IPENZ Hawkes Bay

Hawkes Bay Branch is hosting a coastal process seminar on Tuesday 25th September, from 1:00 pm. to 8:45 pm. For more information please contact Clive Squire at esquire@clear.net.nz.

The 11th NSW Coastal Management Conference, November 13-16th 2001, Australia

This Conference will be "Making Waves - Exploring gaps and exploring solutions". The Conference aims identify and discuss issues, constraints and gaps in coastal management frameworks.

See <http://www.pco.com.au/coastal/> for more information or contact Michelle Ross Tel 02 4984 2554, Fax 02 4984 2755 or e-mail coastal@pco.com.au

The Coastal Disasters Conference 2002, February 24-27th in San Diego, California, USA

This Conference will bring together coastal researchers, scientists and managers to exchange information about coastal disasters. The main areas covered will be projecting future trends, improve links within the industry and identify information gaps.

For more information: <http://www.asce.org/conferences/cd2002>

The 7th International Coastal Symposium, March 25-29th 2002 in Northern Ireland

This Symposium is 7th in a series of International Coastal Symposia supported by the Journal of Coastal Research. It is a multi-disciplinary international symposium convened for scientists, engineers and managers to discuss the latest advances in the scientific understanding, engineering and environmental issues of coastal processes. The 6th ICS was held in Rotorua, NZ.

For more information: <http://www.science.ulst.ac.uk/ics2002/>

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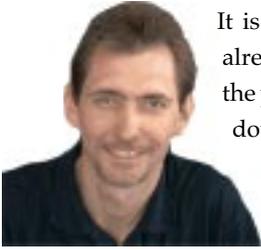
What's On

Marine Education and Recreation Centre (MERC) Winter Lecture Series at 2045 Beach Road, Long Bay, Auckland, 7:30 pm. to 9:00 pm. Phone 09 473 0714 for more information.

Admission \$5 Adults, \$4 Students/pensioners, \$2 Friends of MERC.

July 6th	The Life and Times of the Barque "James Craig"	Wendell C. Phillips (Businessman & sailor)
July 13th	Bay of Plenty: In the Wake of Captain Cook	Mike Pigneguy (Adventure Cruising Co.)
July 20th	The Hokianga and a 97 yr old Scow "Alma"	Graeme Darroch (descendant of the scow builders)
July 27th	Shellfish, Seagrass And Runoff. Mapping & Monitoring Marine Life In The Waitemata	Dr Bruce Hayward (University of Auckland)
August 3rd	Investigating Boating Accidents	Jim Lott (MSA)
August 10th	Archaeological Study of the Hauraki Gulf Island. Evidence of 700 years of human settlement	Dr Peter Jenkins (University of Auckland)
August 17th	Menu & Table Manners of the Sea. How the Sea's Abundance is Shared Amongst the Hungry Hordes	Dr Peter Jenkins (University of Auckland)
August 24th	Sir Peter Blake's Ocean Conservation Voyage	Dr Ross Garrett (Physicist, Yachtsman)
August 31st	The Future for Wales in the South Pacific	Dr Mark Orams (Massey University)
September 7th	Update of ARC's Monitoring for Aquatic Effects of Long Bay Development	Dominic McCarthy (Auckland Regional Council)

New Zealand Coastal Society Chairperson's Report



It is unbelievable, we are already half way through the year and we are on the downward slope to another summer! The committee is also busy preparing for

our seminar in Nelson this October that should be great. You can find details of the Seminar elsewhere in the newsletter.

In my column I would like to discuss some new ideas for the management of our society. A common theme among our member and the committee is the increasing workloads and time required doing our respective jobs. I personally have found it difficult to dedicate the time required fulfilling my own desires and levels of achievement for the Chairperson role this year due to work and family commitments. My own concerns have been mirrored by some vigorous debate within our committee on the direction, focus and action levels of the society.

I have done some soul searching as to where I see the society heading and what are the key areas that need to be addressed and improved as a result of these debates. In my opinion the key benefits to the society members are the newsletter and our annual seminar. These provide a forum for information to be disseminated and ideas exchanged and I believe both are important to refine and improve and maintain in the future. However, I do not believe we can always offer a consensus view of the society, especially for the more specific areas of consideration, as I am aware that there are different points of view within our society members. In my opinion the society's key role is to provide a platform for discussion and debate. Viewpoints can only be expressed where consensus is achieved.

The time and cost to organise both the newsletter and seminar is large, and currently is requiring large time commitments from our committee members. Due to the value of the newsletter, I believe we need to consider some form of financial recognition to people organising it. This may not be a liveable wage or salary, but

certainly recognition of the time required delivering a quality product. Also, by paying for a service we would expect an improved, regular product. Consideration should also be given to only having an electronic version that was placed on the web site, with an e-mail reminder to our members that the new issue is available.

Another area where we can improve communication could be by having an e-mail discussion group. The committee currently does this and ideas can rapidly be disseminated and circulated enabling rapid responses to critical areas. I would like to propose that we consider setting up an e-mail group for the entire society rather than just one for the committee. This would require a manager to maintain an updated list of e-mail recipients and possibly an editor to ensure the information circulated was appropriate for the society members. Similar discussion groups are already available such as COASTNET on the international arena. I believe a local COASTNET-NZ may allow more interactions among our members and a more robust way to canvas the society members opinions on areas where we believe it may be important for the society to have a view.

I also hope that this would allow a smaller committee, with the key focus of that committee to monitor financial the daily running of the society. A subcommittee could be set-up for the organisation of the seminar, with some of the logistics prepared by a conference organiser. This may increase the cost of the seminars. However, I believe that some increase in cost could be justified due to the quality of our seminars, compared to others I have attended at significantly higher cost.

These are my thoughts for a blue print for the future. However, the committee would appreciate your feedback and opinions. These could be made on our web site (address under newsletter letterhead), by e-mail:

reinenhamill@tonkin.co.nz or by facsimile: 09 307 0265.

Happy reading

Richard Reinen-Hamill

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What's hot on the WWW

<http://usinfo.state.gov>

A report by the U.S. National Oceanic and Atmospheric Administration says climate changes in this century may have serious implications for U.S. coastal and marine resources, adding to stresses already occurring due to increasing coastal populations and overfishing. There could be implications for New Zealand.



www.forestresearch.co.nz/cdvn

The Coastal Dune Vegetation Network provides an opportunity for information exchange on sustainable management of coastal dune ecosystems with emphasis on the use of vegetation to restore natural character, form and function. The site also has copies of CDVN newsletters and current bulletins.



<http://www.oceans.govt.nz>

The Oceans Policy is focusing on managing the impact of human behaviour on the marine environment within New Zealand. There is currently no overall policy framework for the marine environment and the aim of the Oceans Policy is to ensure a consistent approach as we work towards common goals. There is a six month public consultation process underway on the development this policy led by Dame Catherine Tizard. This is your opportunity to have a say in the development of New Zealand's Ocean Policy.



<http://earthtrends.wri.org>

The World Resources Institute (WRI) has launched its free, interactive website EarthTrends: The Environmental Information Portal. The website provides access to up to date data, maps presenting global, regional and country level environmental information and details on key environmental and social global trends. A number of these are related to the coastal and marine environment.



continued from page 6

Brown gave us an insight into the problems they face particularly in making people aware of the area's own uniqueness. On this large sand dune system with bordering wetlands, there is great concern for the endangered brown teal and dotterel.

The day concluded with the continuing hospitality of the Island people, with a lovely meal especially catered for at the Golf Club. Sunday was our day of leisure spent either exploring bush tracks and hot pools, nursing hangovers from the Irish pub, snorkelling, kayaking, enjoying more of the Benson's

hospitality, building sand castles or visiting a chilli farm.

A big thank-you to Hugh Leersnyder, Karen Baverstock, Ngaire Sullivan and Stacey Devine from Auckland Regional Council for hosting this conference and for making it such a great success with all your organising and resourcing of the event. A special thanks also goes to Alan Benson our wonderful host from Great Barrier Is and Patrick Thorp from Auckland City Council for organising the great weekend.

*Diana Gainsford, CDVN Coordinator,
Forest Research*

Inventory of New Zealand's Active Dunelands

The Inventory of New Zealand's Active Dunelands was published in late 2000 after three years of work. The idea for the project occurred to me during the process of drafting the New Zealand Coastal Policy Statement in late 1990.

At that time the coastal policy team was frustrated by the lack of regional and national data on the location and conservation status of remaining coastal dune systems (active, semi-vegetated and stable). Such data was needed to justify policy and formulate conservation and management strategies.

The Sand Dune and Beach Vegetation Inventory of New Zealand subsequently identified priority dune systems and their botanical values. In addition, the Protected Natural Areas Programme (PNAP) generated some very detailed botanical surveys of active and stabilised dunelands, primarily in the North Island (e.g. Manawatu-Wanganui). The Sand Dune and Beach Vegetation Inventory provided synoptic coverage, but did not map dunelands. The PNAP data is detailed and recent and 'recommended areas for protection' are mapped; but coverage is still poor.

We proposed and gained funding for a new inventory that sought to (1) locate and map remaining active dunelands; (2) reveal trends in the loss of active dunelands; and (3) develop a basis for detailed classification, mapping and monitoring of dune communities, species and landforms.

Some readers may recall discussion concerning the definition of "duneland" and "active duneland". Our Inventory maps dune environments in which aeolian sand transport is a significant ecological process. Or *was* a significant process until very recently – many formerly "active" dunelands have been prematurely stabilised by marram grass.

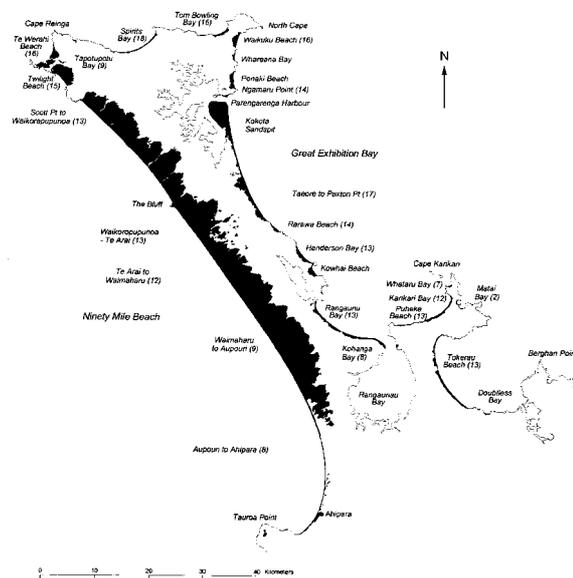
Historic data were extracted from collections of maps, aerial photographs and reports and mapped for each region (for the 1950s, 1970s and 1980s). The 1950s maps predate most coastal development (e.g. afforestation of the west coast active dunelands).

The most recent maps (1990s) are the most accurate, in large part because of the generous assistance and feedback received from regional council, DoC Conservancy and district council staff. Many thanks.

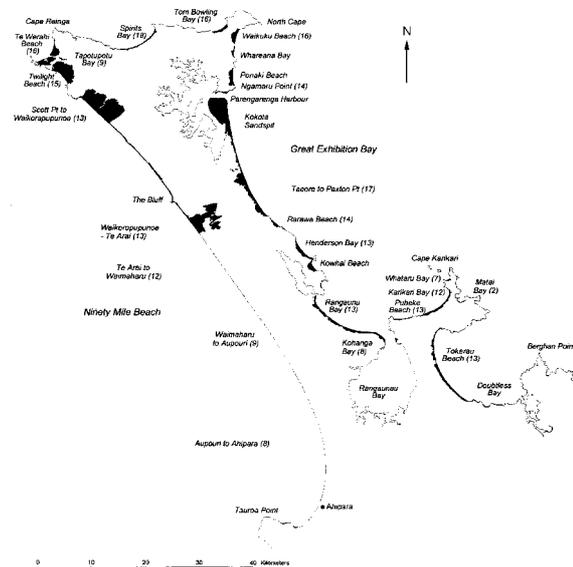
Key findings:

1. Active dunelands were present in all regions following World War II, though they were most extensive along the west coasts of the three main

Northland 1957 - 1961



Northland 1993





Active dunes march inland over bush and scrub on the Kaipara North Head (photo Keith Smith)

islands. Large areas of active duneland were present along the Aupouri Peninsula (see maps on page 11), the Kaipara barriers (see photo above) the Awhitu barrier, the Manawatu and the west coast of Stewart Island. Numerous smaller active dunelands occurred in all parts of New Zealand, including ecological regions not usually thought of as containing sandy coasts (e.g. Fiordland).

2. The national area of active duneland in New Zealand, around 129,000 ha in the early 1900s, has undergone a marked decline since World War II. By the early 1990s the area had been reduced to about 39,000 ha, a 70% reduction.
3. The area of active duneland has declined in all regions; however, those regions that once contained the largest areas of active duneland have experienced the greatest decline. The area of active duneland in Northland, which contained almost half of the national total, has declined by 76%, mostly as a result of *Pinus radiata* plantings. The trends are similar in Auckland and the Manawatu.
4. The decline in the total area of duneland has probably continued through the late 1990s, but at a reduced rate.

Where to now?

Leonard Cockayne described active dunelands as

or lowland forests. The Otago Region is one of the worst affected areas. The Region contained 1039 ha of active duneland in the late 1990s, but only 3-500 m² of pingao remains. Pingao is now very rare in Otago and will be lost without intensive management. A range of associated species dune plant species will also be lost.

Intact and unmodified dune systems throughout New Zealand are few and most face ongoing pressure. Therefore, almost all the remaining active dune systems that contain little or no marram grass and exhibit a moderate to high degree of naturalness are of conservation importance. Even degraded systems may be of importance in conserving representative examples of particular species or communities or for cultural reasons.

Phase Two of the Inventory should identify, map and describe the biophysical attributes of all remaining active dune systems of conservation significance. At the same time we need to develop a classification of coastal dune systems to allow the identification of representative and exceptional landforms and associated indigenous plant communities. We should incorporate older, vegetated, dunelands as well as remaining active dunelands. Detailed maps of duneland form and flora are needed to facilitate effective management and conservation of what remains of this distinctive and once common element of our coastal environment.

The Inventory of New Zealand's Active Dunelands (Science for Conservation 157. 30p + 124 maps, ISBN 0-478-21968-7) was prepared by Mike Hilton, Ursula McCauley & Ralph Henderson.

The project was funded by the University of Otago and Department of Conservation.

*Mike Hilton,
University of Otago*

Back Issues of *Coastal News*

Back issues of *Coastal News* (from Issue 6 (April 1996)) to date are available on the NZCS website. The address is:



www.cae.canterbury.ac.nz/nzcs/publications.htm

Australasian Geographers Gather in Dunedin

The New Zealand Geographical Society (NZGS) and the Institute of Australian Geographers gathered for a joint conference at the University of Otago in January 2001. Hosted by the Otago Branch of the NZGS, this gathering continues a trend of collaboration between these professional societies who share common interests in coastal processes, ecology and management.

The pre-conference field trip provided participants with an opportunity to examine the dune systems of southern New Zealand, including the forested dune-ridge barriers of the Catlin's coast and the transgressive dune systems of the west coast of Stewart Island. Marram grass eradication operations were examined at Tahakopa Beach and Mason Bay and compared with relatively pristine dune systems.

Four sessions were devoted to matters coastal: 'Coastal Geomorphology', 'Quaternary Sea-level Change and Coastal Development', 'Dune Geomorphology and Ecology' and 'Coastal Management and Ecology'.

The following brief accounts indicate the wide range of topics examined.

Roger McLean, University of New South Wales, reviewed the scientific basis for the 2001 IPCC assessments of coastal change related to global warming and sea-level rise. He argued that some of the conclusions are well founded in science (e.g. impacts on tidal wetlands), while in other areas little progress has been made (e.g. impacts on sandy beaches and barriers). Considerable emphasis has been placed on the potential impacts of sea-level rise, with little attention given to other climate change variables.

Catherine Greve and Peter Cowell of the Coastal Studies Unit, University of Sydney, presented a GIS methodology for modelling the potential socio-economic impacts due to an increase in sea level and a design storm in the next 50 years. Risk (R) in this study is defined as a function of hazard (H) and vulnerability (V) over time (t); i.e.. $R = f(H; V; t)$ expressed in monetary terms. The generalized risk zones determined at sites in New South Wales were described as representing possible present and future areas at risk, weighted in terms of hazard level and exposure values.

Judith Earl-Goulet, a PhD candidate at the University of Guelph, Canada, presented aspects of her

work on foredune sedimentation on beaches around the Otago Peninsula. Beach-foredune sedimentation has developed as an important theme in dune geomorphology and ecology over the last decade. Judith found that maximum sediment accumulation did not necessarily occur at sites with the highest vegetation cover! A finding that might be of interest to those eager to carpet New Zealand's dunes with plants.

Several talks were concerned with reconstructing sea-level histories in Australia and elsewhere. Robert Baker and others from the University of New England, Armidale, presented compelling evidence of the value of fixed biological indicators in the construction of late-Quaternary sea level histories. Their method uses the tubeworm *Galeolaria caespitosa*, which allows precise measurement of relative sea-level fluctuations by using the differential between emerged sub-fossil encrustations and current distributions of the same species. Some excellent sub-fossil sites in caves and other sheltered sites were described. Perhaps there is scope for similar work in New Zealand?

Bob Haworth and others, also from the University of New England, examined the curious case of the Botany Bay dugong, excavated from a salt marsh in the 1890s. Bob argued that the dugong remains, closely associated with aboriginal artifacts, may contribute to our understanding of climate and sea-level change over the last 5500 years. The remains, dated at around 5520 year BP, in conjunction with associated peat layers, point to a warmer marine environment, higher sea-levels and significant short term, late-Holocene, sea-level fluctuation. This study stimulated much discussion and some criticism of the methodology employed. But the researchers were clearly innovative in gathering data towards a conclusion and the presentation concluded with warm applause.

This small sample points to the breadth of interest of coastal geographers, the development and benefits of multidisciplinary enquiry and the applied nature of much coastal research.

The Coastal Society is well placed to facilitate the communication and application of such work, through the pages of this newsletter and perhaps through dedicated reports.

Mike Hilton, University of Otago

Coastal News





Sustainable Auckland Congress, September 18-21, 2001 Aotea Centre, Auckland

The Sustainable Auckland Congress is an opportunity to review information that is available on sustainable cities and to suggest ways of developing a vision towards a goal of a sustainable city.

This is a chance to participate in a large-scale conference dedicated to identifying the issues and options of how to create a truly sustainable city. Highlights include:

Day 1: The opening address is presented by Rt Hon Helen Clark, Prime Minister. There will be International Keynotes from Alan Atkinson about an International Perspective on Sustainability and Sustainable Cities as well as from Maurice Strong, Advisor to Toronto and Canada, Jerry Brown, Mayor of Oakland, California.

Day 2: There will be Specialists presenting and four parallel Workshops on sustainability assessments covering areas such as Energy & Environment and Urban Design.

Day 3: There will be Specialists presenting and five parallel Workshops on sustainability assessments with topics including Science/Engineering and the Public Sector.

Day 4: The Congress is summarised and closed by Community Groups focusing on hopes for the future.

For more information:

[www.sustainableauckland.co.nz/
congress.asp](http://www.sustainableauckland.co.nz/congress.asp)



Test your coastal knowledge - where is this coastline? (answer on page 16)

Sustainable Coastal Development in the Wairarapa

There has been growing pressure in recent times to subdivide and develop along the Wairarapa coastline. Some of the development proposals have been large-scale, and situated in remote, largely undeveloped areas. This has led to wide ranging debate in the community about the appropriateness of such development. The Wellington Regional Council has considered that some of these developments, or aspects of these developments, are inappropriate, and has submitted this position on District Council consent applications. A number of these applications have been appealed by applicants and submitters to the Environment Court.

In response to this, the South Wairarapa District Council and Wellington Regional Council considered it a good idea to hold a Coastal Forum to discuss the issues, raise awareness, and identify options to better address future coastal development. More specifically, the forum sought to:

- Raise awareness that the coastal environment is a particularly sensitive environment, and that not all subdivision, use and development is appropriate.
- Emphasise the requirement to have regard to the natural character of the coastal environment when considering resource consent applications.
- Demonstrate how sustainable development in the coastal environment can be achieved whilst providing for the coasts special values.
- Achieve agreement between parties (all Councils and Iwi) to work together to better address coastal development issues (this could include the development of a joint Wairarapa coastal strategy and/or guidelines).

The forum was held in February this year at Martinborough. Councillors, hearings committee members, and staff involved with coastal development from the Regional Council and three Wairarapa District Councils, and Iwi were invited to take part.

Presentations were made by Dr Morgan Williams (Parliamentary Commissioner for the Environment), Jim Dahm (Coastal Management Consultant), Rebecca Maplesden (Planner, Ministry for the Environment), and Frank Boffa (Landscape Architect) on various topics relating to coastal development.

Questions from the floor followed each presenter, with an open discussion at the end of the day to determine how to proceed from here. During this discussion each Council and Iwi expressed a

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**Coastal
News**



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 about 300 members. Members represent the 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 the Secretary (see above)

commitment to work together to better address coastal development issues, in particular to develop a comprehensive and integrated coastal strategy for the Wairarapa. There was also general agreement that the strategic study, once agreed to between councils, should be publicly notified and discussed, and include key groups such as land-owners and the Department of Conservation.

One meeting of Council and Iwi representatives

has been held since the forum.

It was agreed at this meeting that an issues and options paper be prepared as a starting point for stakeholder and public consultation.

For further details, or if you have any *words of wisdom*, please contact Karen Brewster (Policy and Planning) at the Wellington Regional Council on (06) 378-2484 or karen.brewster@wrc.govt.nz



Code of Ethics

I recently received a letter concerning the ethics of peer reviewers that I would like to share with you. I have reproduced the key points from the letter below:

“Over the past several years there have been a number of coastal consultants involved in projects collecting data or undertaking investigations along this region’s coast. This work has been initiated by a number of organisations.

As a result of these investigations there has been a range of views on certain aspects of coastal processes expressed. While this is healthy, the method of promotion of some of these views is, I believe, detrimental to the coastal consultant industry.

It appears that within the industry there is no Code of Ethics and that one consultant expressing criticism of another consultant’s work or conclusion is, as a result, relatively common. Often these criticisms are expressed such that they appear in the public environment.

I personally find the situation unhelpful and believe that in the longer term this approach will reflect adversely on you whole industry. I suggest that consideration is given to establishing an industry Code of Ethics”

I believe it would be an excellent idea for our society to develop or adopt an appropriate code of ethics and also to provide some guidelines for our members to follow during a review.

The committee will consider the letter in our next meeting. Should a code of ethics or guideline for review for comment be prepared we will circulate if for comment in this newsletter. Should you have any comments or suggestions you wish to share now, please put them on our web page (which can be found at www.cae.canterbury.ac.nz/nzcs/nzcs.htm), or e-mail me at reinenhamill@tonkin.co.nz.

Richard Reinen-Hamill

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Where is this coastline (page 14)? Answer: Bethells/Te Henga looking north along the beach towards O’Neills Bay.