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Destination Dunedin

What do bagpipes, penguins and the infamous Project Aqua all have in common? They are all to be experienced at the 2004 Annual Conference of the New Zealand Coastal Society to be held at the Otago Museum in Dunedin from 18-20 October, 2004. And you are all invited!

The 2004 conference theme - Making Connections: Cross-boundary Coastal Management - aims to encourage the consideration of integrated coastal management, which, although a global theme, is an often overlooked goal of coastal management in New Zealand. This year's conference includes a full three-day programme which will explore this theme through local and regional field trips, presentations and workshops.

Three local fieldtrips have been selected to provide opportunities to examine the local coastlines



Port Chalmers has expanded rapidly in recent years. Not without controversy. Relations between the community and the Port have, at times, been strained. Key concerns raised, particularly over the container terminal, include noise, vehicle movement and reclamation.

and give examples that might be discussed during workshops. The fieldtrips will visit the Otago Harbour and Port Chalmers, the Tahuna Wastewater Treatment plants, St Kilda Beach, to examine coastal erosion, and beach mining

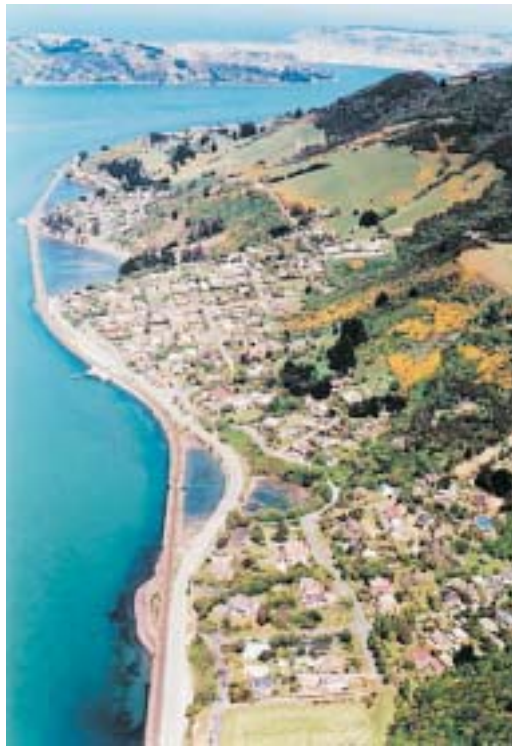
sites south of Dunedin.

An exciting array of plenary presentations from local and overseas speakers is planned. The international speakers include coastal authorities such as Professor Paul Komar (Oregon State University), Professor Nick Harvey (Adelaide University) and Dr Liana McManus (Chair, Scientific Steering Committee of LOICZ). (See page 4 for further details.) There has been unprecedented

interest in the coast over the last 18 months, in relation to property values, aquaculture management, Maori claims to foreshore and seabed, the development of an oceans policy, coastal subdivision and settlement, sand mining,



North Otago affords few opportunities for safe anchorage in a southerly gale. The ports of Oamaru and Timaru depend on large breakwaters, of various constructions, to provide shelter. The Little Blue penguin colony is located in a disused quarry at the base of the Oamaru breakwater



Many of Dunedin's suburbs border either Otago Harbour or the ocean. The margins of the harbour have been significantly modified by reclamation and the construction of road embankments and causeways. This scene (looking west from St Leonard's towards Dunedin) highlights the causeways supporting State Highway 88 to Port Chalmers and the main trunk line between Dunedin and the Port. Gaps were left in the causeways, which have caused jetting during flood tides and unusual geomorphic and ecological patterns.

and so forth. Local speakers will review developments and events related to coastal management in New Zealand.

The 2004 NZCS conference is a little different from previous years, as there will be four workshops within the conference. The workshops will explore topical themes of national significance including state of the coast environment reporting and coastal monitoring; coastal hazard management; regional coastal plans and the identification of aquaculture management areas; and port operations and coastal communities.

This year's conference has one other significant difference. NZCS will be convening a special, daylong, workshop on the impact of major dams, diversions and water abstraction on coastal sedimentation in New Zealand. This is presently a major issue in New Zealand and the workshop seeks to examine the state of our knowledge in relation to catchment-coast sediment transport and coastal change. The workshop is being organised with the support of the Royal Society of New Zealand (IGBP Committee) and LOICZ (Land-Ocean Interactions in the Coastal Zone). The workshop will entail morning presentations from international speakers and New Zealand scientists involved in Project Aqua and similar hydroelectric schemes. These will be followed by a field trip to the coasts of North Otago,



Saltmarsh and saltmeadows replace mangroves in southern New Zealand. These habitats have been much modified by farming, reclamation and drainage. The Merton Arm of the Waikouaiti Estuary, just north of Dunedin, retains high natural values despite these impacts.

Oamaru and the Waitaki Delta.

However, the conference will not be all work and no play. The traditional social side of an NZCS conference will be upheld in grand style with this year's organising committee demonstrating the full meaning of 'southern hospitality'. The social events will commence with a cocktail evening on Monday in the Southern Lands Gallery of the Otago Museum. The next night the conference banquet will be held in royal style at Larnach Castle, atop a hill that commands panoramic views of the Otago Harbour. The conference will conclude with a sunset dinner at the Little Blue



Oamaru Harbour was once a key transit point for North Otago agricultural produce. It is now, arguably, better known for the rapidly expanding Little Blue Penguin Colony. These giant tetrapods lie alongside the colony, which is itself located in a disused quarry of massive proportions, creating an unlikely mix of ecotourism and heavy engineering.



The St Clair coastline is a key recreational facility bordering the southern suburbs of Dunedin. Storms during September 2002 created spectacular scarps, exposing fill material at Middle Beach. Recent debate has centred on whether sewage from the Tahuna Treatment Plant should be treated to a higher level of secondary treatment before or after the construction of an offshore discharge



The Oamaru coast has eroded rapidly in recent years. The road at All-Day Bay has been moved twice over the last 30 years. The current proposal is to shift the road again, which may or may not be there in October, and place rock at the base of the scarp.

Penguin Colony in Oamaru. Then there is the trip to the local boutique brewery...

Those planning to participate in the conference are invited to register as soon as possible as conference places are limited. Registration forms are available for download from the website at

www.coastalsociety.org.nz/conference2004.htm. An early bird registration is offered to those registering before 31 August.

The submission of papers are welcomed before the 31 August, particularly short papers of approximately 10 minutes duration, which can be offered in one of the four workshops. Longer, plenary session, papers of around 30 minutes may also be submitted. Posters on any coastal subject are welcome. These will be available for viewing during morning and afternoon teas, lunch sessions and the cocktail evening. Trade displays are also welcome.

The conference committee look forward to seeing you in Dunedin in October.

Mike Hilton
Convenor, 2004 NZCS Conference

For further information on sponsorship, attendance or any other conference matters please contact Julia Laming (lamju985@student.otago.ac.nz).



The Otago Peninsula contains several breeding populations of the endangered Yellow-eyed Penguin. Viewing sites are located at Sandfly Bay, just a few minutes drive from downtown Dunedin. The Penguins are symbolic of the ecology of the southeast coast of New Zealand which shares a number of species with the subantarctic islands. The New Zealand sea lion (formerly Hookers sea lion) can also be viewed at Sandfly Bay.

To register, go to: www.coastalsociety.org.nz

NZCS Management Committee

Chairperson	—	Harvey Brookes (harvey.brookes@arc.govt.nz)
Secretary/Treasurer	—	Eric Verstappen (eric@tdc.govt.nz)
Conference 2004 Coordinator	—	Mike Hilton (mjh@geography.otago.ac.nz)
Regional Coordinator	—	to be appointed
Website Coordinator	—	John Lumsden (j.lumsden@clear.net.nz)
Coastal News Coordinator	—	Lucy Brake (lbrake@beca.co.nz)
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		Doug Ramsay (d.ramsay@niwa.govt.nz)
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Website	—	Charles Hendtlass (c.hendtlass@cae.canterbury.ac.nz)



New Zealand Coastal Society 2004 Conference

Keynote Speakers



Professor Paul Komar

Paul D. Komar is Professor of Oceanography at Oregon State University in Corvallis, Oregon in the USA. Professor Komar received his Ph.D. from Scripps Institution of Oceanography at the University of California in San Diego in 1969. He has over 30 years of research, writing and editing publications, teaching and consulting experience covering broad areas of geology and oceanography. Professor Komar's current research includes studies of coastal erosion in Oregon and New Zealand, sediment accumulation in Oregon estuaries, and the effects of land-use practices on sediment yields from rivers. Other topics of special interest include beach processes and sedimentation; processes of coastal erosion; hydrodynamics of deep-sea turbidity currents; erosion processes of megafloods on Earth and Mars; and gravel transport in rivers.



Professor Nick Harvey

Nick Harvey is Head of Geography and Environmental Studies at the University of Adelaide in South Australia. He was Vice-Chair of the international scientific steering committee for LOICZ from 1997-2002. Professor Harvey also served on the Coastal Protection Board of South Australia for seven years. He is currently Chair of the international START-Oceania committee and is scientific leader for the APN global change coastal zone management synthesis for the Asia-Pacific region. He has written over 100 scientific papers and books including many

on coastal science and management such Coastal Management in Australia published last year by OUP. Most recently he has been appointed as one of a number of lead authors for the next IPCC (Intergovernmental Panel on Climate Change) assessment of the global impacts of climate change.

Dr Liana Talaue-McManus



Liana Talaue-McManus obtained her Ph.D. in Oceanography at the American University of Rhode Island in 1986. She joined the University of the Philippines Marine Science Institute as an Assistant Professor, and there established

a dual research track on plankton productivity and integrated coastal resources management. She coordinated an eight-year coastal research program in the municipality of Bolinao, northern Philippines that included integrated scientific assessments and participatory engagement mechanisms for policy development. At the regional level, she conducted a transboundary diagnostic analysis of the South China Sea, as well as coordinated a 7-country initiative to examine the social and economic root causes of water related problems among its littoral states. At the global scale, she is involved in analyzing both the biophysical and socioeconomic bases of a worldwide coastal typology as the Chair of the Scientific Steering Committee of the Land-Ocean Interaction in the Coastal Zone (LOICZ) Project. She recently moved to the Rosenstiel School of Marine and Atmospheric Science of the University of Miami, where she is an Associate Professor of Marine Affairs and Policy.

Communities Caring for the Coast

Locals Rally to Save the Whaingaroa Harbour

Nine years ago Whaingaroa Harbour, near Raglan, was dying. The waters stayed brown and murky for days after heavy rain. Recreational fishers averaged less than one fish and half a cup of whitebait for every 18 hours spent fishing. Stock wandered freely along the harbour's edge and the mudflats were barren of life.

A poster at the local library asked "Do YOU care?" and a small group of locals answered "Yes!" From these humble beginnings, over half a million native trees have been planted along the streams feeding into the Whaingaroa Harbour and almost 300 km of fencing has been erected to protect the waters from the wanderings of stock. The result of this work is amazing. The harbour is now clear, the mudflats are teeming with life, and recreational fishers are now catching, on average, a fish every two hours and harvesting up to half a bucket of whitebait. Dairy farm productivity is also up,

ecotourism operations are booming and community programmes such as flax-weaving courses have become possible.

Pohutukawa Returns to the East Cape

Te Araroa is just one of numerous examples of Project Crimson working with the local community to restore the brilliant red flowers of the pohutukawa to the coast. Local landowners, marae communities, the Te Araroa Progressive Association, the Department of Conservation and students from Te Waha o Rerekohu Area School (named after a famous pohutukawa in the school grounds) have been planting pohutukawa, provided by Project Crimson, along the 21 km coastal verge between Te Araroa and the East Cape for the last five years. As well as planting, the volunteers have fenced land to provide protection from stock, weeded and watered young plants during dry summers, and carried out pest control in the area.



Profile: Lucy Brake

NZCS Management Committee Member



Lucy Brake has been a member of the New Zealand Coastal Society for more than eight years. She first joined the Society when she was a student completing a BSc degree in Environmental Science from the University of Auckland.

Lucy became a member of the Management

Committee in 2000 when she became the assistant editor, and later the editor, of the NZCS publication - *Coastal News*. She is currently the Coastal News Coordinator.

Lucy first came to New Zealand from the UK in

1990 while travelling and later returned in 1994 to study. After graduating she worked for the Auckland Regional Council from 1997 to 1999. This was followed by a three year stint with Environment Bay of Plenty.

Lucy was awarded a Winston Churchill Fellowship in 2001 where she visited the USA, UK and Australia studying coastal management in these countries.

Lucy is currently a Senior Coastal Planner with Beca located in their Tauranga office. Lucy's job with Beca includes working on, and managing, various coastal projects around the country and overseas. Lucy has also just completed a PGDip in Environmental Science.

When she is not working Lucy is still drawn to the sea. She spends her spare time in such pursuits as windsurfing, sailing, as well as running with her dog, and hanging out with her friends.

**Coastal
News**





Need innovative solutions?

If you are dealing with sedimentation behind structures or within marinas, water clarity in a marine reserve, or impacts of landuse on estuarine ecosystems, you need to know about sediment particles.

This is where our LISST-ST particle analyser, the only one of its kind in New Zealand, can help you. For the first time, the LISST-ST lets you make rapid, in situ measurements of particle size and settling-velocity distributions.



NIWA can

Measure particles for you
We will provide the instrument plus an experienced operator to participate in your experimental programme, and then give you the raw and/or summarised data as required.

Answer your questions regarding sediment particles
We will design and execute measurement programmes, followed by analysis, interpretation, and reporting of data to you.

Good data is essential for solving complex problems. Our range of estuarine, marine, and coastal instrumentation, the largest in New Zealand, has been tailored to fulfil that need.

To make our instruments work for you, contact Doug Ramsay on 64-7-859 1894, or email d.ramsay@niwa.co.nz

www.niwa.co.nz

Conferences/Workshops

Coastal News



Environmental Defence Society - The New Zealand Coastal Conference

6-7 August, 2004, Auckland

Dramatically increasing development pressures mean the coast is one of the most difficult areas for planning and land management. This two-day conference will profile examples of best practice for coastal and lakeside subdivision, with reference to both local and international experience. It will also explore whether some areas should be off-limits for subdivision and why. The conference, run in conjunction with the NZCS and NZLAA, will provide an opportunity for a national dialogue on the highly topical issues of coastal and lakeside management.

For further information visit eds.eventmergers.co.nz or contact Events Managers carlene@eventmergers.co.nz or 09 426 3066.

Coastal Zone Asia Pacific Conference

5-9 September, 2004, Brisbane, Australia

The 2004 Coastal Zone Asia Pacific conference - "Improving the quality of life in coastal areas" - will include sessions on:

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

For further details visit: www.coastal.crc.org.au/czap04/index.html or contact Don Alcock, Communication Manager, Coastal CRC, don.alcock@nrm.qld.gov.au or Sally Brown, Conference Connections, sally.brown@uq.net.au.

Restore America's Estuaries

12-15 September, 2004, Seattle, Washington, USA

The coastal and estuarine habitat restoration community is 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.

For more information visit www.estuaries.org/2ndnationalconference.php or contact Steve Emmett-Mattox at Restore America's Estuaries sem@estuaries.org.

American Shore & Beach Preservation Association Conference

13-15 September, 2004, New Orleans, Louisiana, USA

The ASBPA is the nation's oldest organization promoting science-based policies for the protection of beaches and shores. The theme for this year's conference - "America's Shoreline: Beach and Ecosystem Restoration in the 21st Century" - will include sessions on:

- beach nourishment design;
- marsh and ecosystem restoration;
- coastal shoreline management issues;
- coastal structures for maintaining beaches;
- effects of hurricanes on shorelines;
- national and local beach policy issues; and
- shoreline erosion solutions.

For further information visit www.asbpa.org/cfp2004mtg.

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; and
- coastal legislation, planning and co-operation.

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

International Workshop on Wave Hindcasting and Forecasting Conference

14-19 November, 2004, North Shore, Oahu, Hawaii, USA

An international workshop on wave prediction in coastal areas sponsored by the U.S. Army Engineer Research and Development Center's Coastal and Hydraulics Laboratory, Environment Canada, Joint Technical Commission for Oceanography and Marine Meteorology will include topics on:

- theoretical, numerical, laboratory, and field studies of wave phenomena in coastal areas up through the surf zone;
- the interpretation of climatic characteristics of waves in coastal areas;
- data assimilation/ fusion methods for coastal applications; and
- coastal meteorological phenomena affecting waves and the impact of these phenomena on operations and design considerations in coastal areas.

For further information contact Donald Resio on Donald.T.Resio@erdc.usace.army.mil or Val Swail on Val.Swail@ec.gc.ca or visit hwww.oceanweather.com/8thwave/.

The 4th International Surfing Reef Symposium - Natural and Artificial Surfing Reefs, Surf Science and Coastal Management

12 - 15 January, 2005, Manhattan Beach, California

This conference aims to continue an open dialog amongst surfers, scientists, ocean enthusiasts and coastal zone managers regarding topics such as:

- surfing science – quantitative and qualitative descriptions of surfing waves;
- surfing and coastal zone management;
- current and proposed reef projects;
- numerical modeling and design techniques;
- sediment transport and salient formation;
- natural and artificial reef biological issues;
- surfing economics and environmental impacts;
- surf forecasting and weather; and
- urban surfing issues; water quality, runoff and pollution.

For more information see www.surfrider.org/reef4/

International Conference on Coastal Conservation and Management in the Atlantic and Mediterranean

April 17-20, 2005, Tavira, Algarve, Portugal

ICCCM2005 will be a forum for scientists, engineers, planners and managers to discuss recent or new advances in scientific, technical, and socio-economic understanding of environmental issues related to coastal processes.

For further information visit icccm2005.no.sapo.pt.

Solutions to Coastal Disasters 2005

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

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

For further information visit www.asce.org/conferences/cd05.

Coasts and Ports Conference

September 21-23, 2005, Adelaide, Australia

Themes for the conference include:

- coastal processes: their modelling, prediction and management;
- coastal planning and policy;
- catchment to coast;
- local government and the coast;
- aquaculture engineering, policy and planning;
- port infrastructure and its accommodation within urbanised coastal areas;
- maximising port efficiency by coordinating diverse business needs;
- managing the needs of society, the environment and industry; and
- innovation in coastal, ocean and port engineering.

Abstracts should be submitted by 31st August, 2004 at www.plevin.com.au/coastsandports2005 or emailed to coastsandports2005@plevin.com.au.

International Conference on the Mediterranean Coastal Environment

September/October 2005, Kusadasi, Turkey

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

For further information visit www.medcoast.org.tr.

Seeking Contributions to Coastal News

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

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

**Coastal
News**



Managing Coastal Hazards – Local Best Practice

A Bay of Plenty NZCS/New Zealand Planning Institute (NZPI) joint workshop on the management of coastal hazards, held in Tauranga recently, attracted over 70 participants from as far a field as the Coromandel. The event gave the opportunity for some of the Bay of Plenty councils involved in coastal management to illustrate that they not only recognised coastal hazard management as a major issue, but to provide examples on how they dealt with the situation.

The Bay of Plenty region is symptomatic of the challenges facing local authorities with the demand for coastal living, and subsequent pressure for coastal space, needing to be balanced with the requirements for prudent planning and management to minimise the risks from coastal hazards.

The workshop began with an overview of the Bay of Plenty's initiative to identify and address coastal hazards by Environment Bay of Plenty. Initially coastal hazard management directives were achieved through the Regional Coastal Environment Plan (RCEP) and the application of

a blanket setback mechanism for the entire coastline known as the "Area Sensitive to Coastal Hazards" (ASCH).

The guidelines were determined with the best information available in the 90's and were deliberately conservative so as to encourage more detailed investigations to be carried out by local councils. The council's own coastal hazard assessments would then take precedence over the ASCH line in the RCEP. Environment Bay of Plenty went on to outline some of the newer initiatives being undertaken including coastal hazard indicators, and a thorough investigation of offshore dynamics (primarily for aquaculture assessment) via remote data collection.

Tauranga City Council (TCC) continued the theme with an urban planning perspective. There was mention of innovative solutions, such as re-locatable houses and in-ground pumps to mitigate coastal flooding.

Land use planning by TCC has been designed around its own programme of beach monitoring

Coastal News

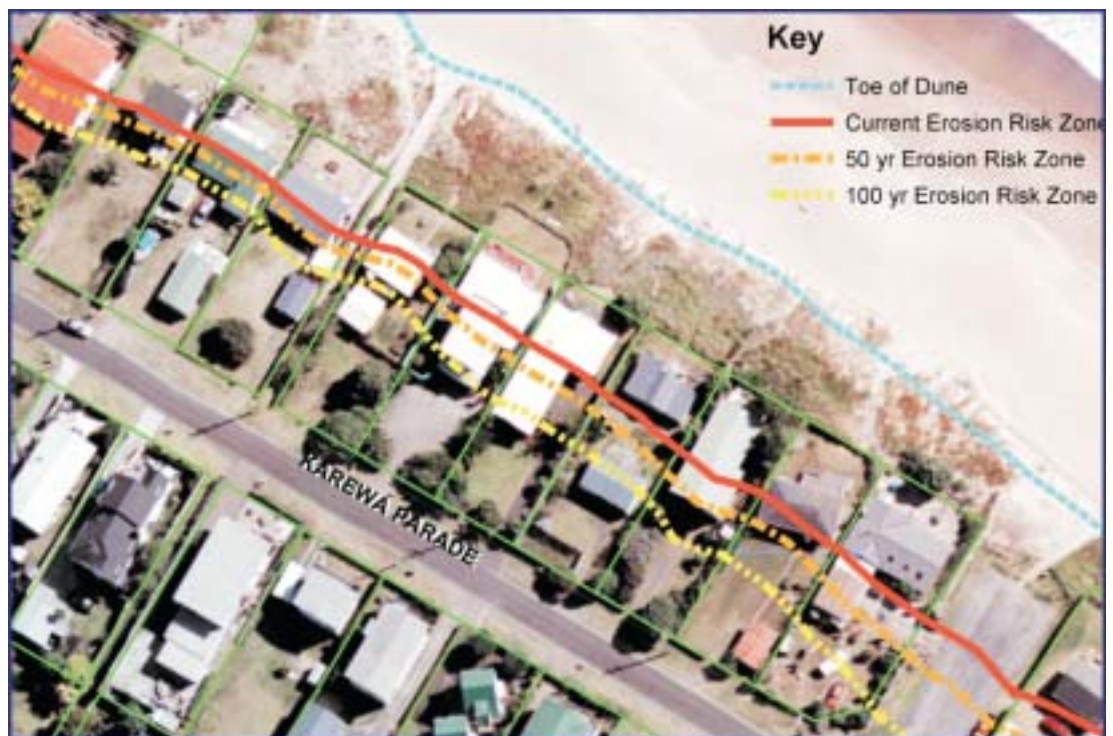


Figure 1: TCC 2004 Plan Change proposed hazard zones at Papamoa

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)



An example of a re-locatable house on Oceanbeach Rd, Mt Maunganui

and provides for degrees of risk allowing varying degrees of freedom. TCC believes that houses most at risk are always the most expensive and sought after, even though surveying has identified that residents consider coastal erosion to be the natural hazard of greatest concern in the area.

The presentation from the Opotiki District Council (ODC) team differed from the others in that it provided a perspective on rural and often multiple-owned blocks in some instances. The examples provided included burgeoning coastal pressures

at "old favourites" like Ohiwa Spit and new subdivisions at Waiotahi Drifts where sections sell for \$500K plus.

The workshop was rounded off with speakers from CoastCare and the Coastal Dune Vegetation Network (CDVN) outlining their successes with non-regulatory methods and the "ground up" approach of reducing the risk of coastal hazards.

One example was the re-planting programme, initiated in 1996, at the steadily eroding northern end of Waihi Beach. This programme has been astonishing in its success and there is now a large healthy foredune buffer present.

Those attending the workshop thought it highly successful and a useful opportunity for sharing ideas, networking, and educational at all levels on the best practices for coastal hazard management in the Bay of Plenty. The one drawback was that there were so many ideas to explore and debate that the discussion time could have gone on all night.

*Tom FitzGerald
Bay of Plenty Regional Coordinator
tomf@envbop.govt.nz*



Waihi Beach North End as it is now after intensive planting by the local CoastCare group.

Profile: Peter Atkinson NZCS Taranaki Regional Coordinator



Peter Atkinson has worked in the ports industry since graduating from the University of Canterbury in 1974 when he joined the Otago Harbour Board. At the OHB he was responsible for dredging and channel maintenance and

undertook a number of investigations for special projects including the impact of the Aramoana Aluminium Smelter. As part of these investigations Peter designed and built a fixed bed model of the outer part of the harbour.

In 1982 he joined the then Taranaki Harbours Board and in 1983 became its Chief Engineer. One of the ongoing tasks Peter was involved with in this role was seeking solutions to the

effect of Port Taranaki on the New Plymouth coastline. The investigations, initiated and guided by Peter, were undertaken over a six year period by Dr Peter McComb and Dr Kerry Black and involved one of the largest coastal data collection programmes on the New Zealand coast. The site selection was carried out by extensive numerical modeling of the coast. This work culminated in 2002 with a resource consent to place sand in an inshore area close to the New Plymouth reef system.

In 2001 Westgate Transport Ltd, the operator of Port Taranaki, sold its engineering services to Duffill Watts and King Ltd. Peter's work with Duffill Watts and King currently involves a number of coastal projects outside the port area.

To contact Peter you can email him at: dwk.newplymouth@duffillwatts.com.

LIDAR – A New Tool for Mapping Coastal Change

Historically, changes in coastal landscapes have been difficult to monitor in detail. This is due to the time and expense required in obtaining sufficiently dense and accurate data that show the transformations occurring over time. LIDAR (Light Detecting And Ranging) is a relatively new

remote-sensing technology which simplifies the process by providing a tool that produces a high-resolution DTM (Digital Terrain Model,) with a level of accuracy suitable for detecting fluctuations in the beach environment.

LIDAR has been successfully used in both Europe

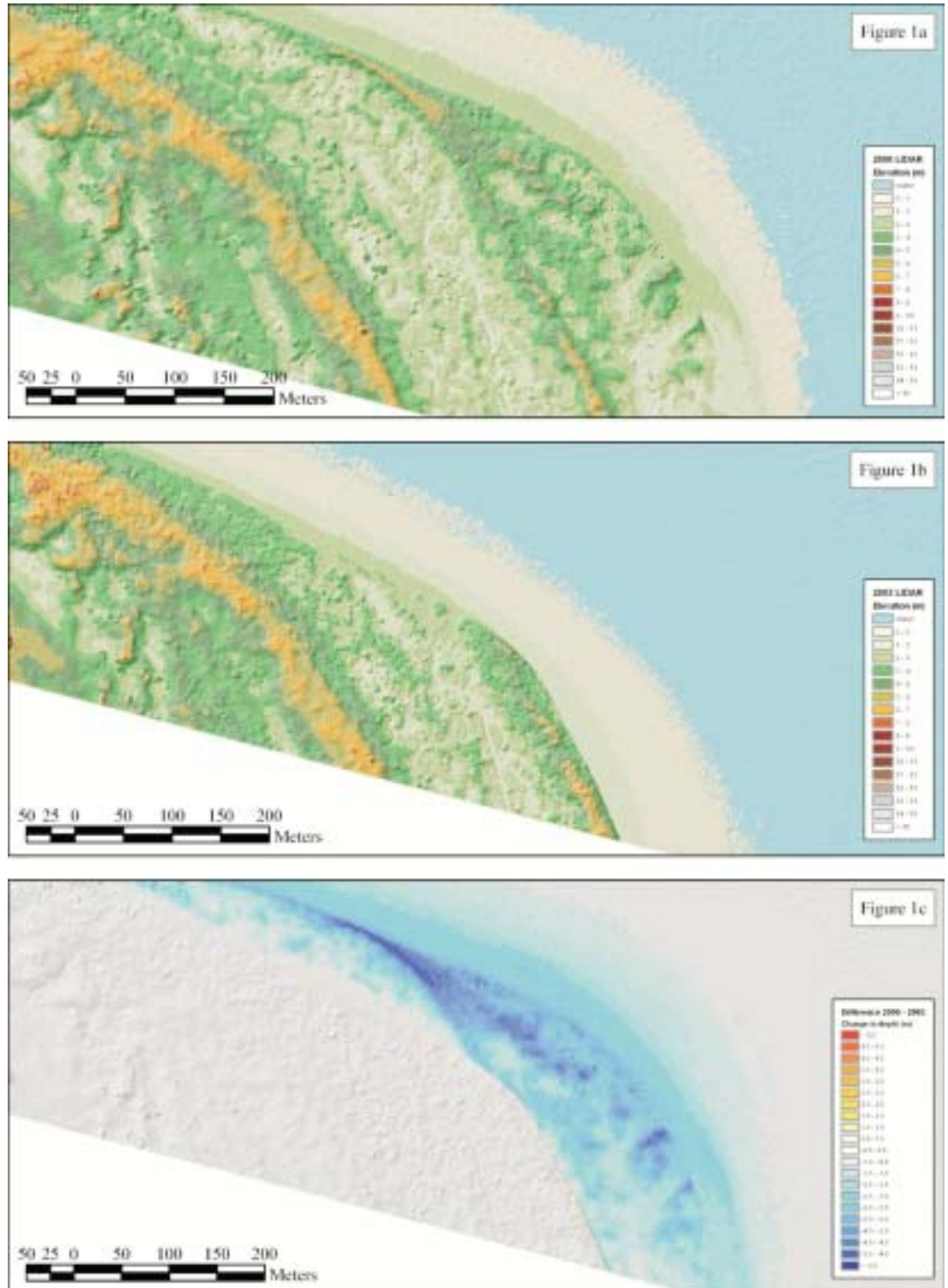


Figure 1. Comparison of LIDAR data acquired in May 2000 and October 2003 for Ohiwa Harbour Spit. Figures 1a and 1b show colour-coded elevation data, draped on shaded-relief models, for May 2000 and October 2003 respectively. Figure 1c shows the colour-coded change in sand depth for this period, draped on the 2003 shaded-relief model.

and the US for coastal monitoring, but to date there has been little application of this technology in Australasia. One local authority in New Zealand, Environment Bay of Plenty, initially acquired coastal data in May 2000 (see Coastal News issue number 16, for a discussion on this survey). In October 2003, the Regional Council acquired repeat coverage over selected sites in the Bay of Plenty coastal region, including Ohope Beach, in the Eastern Bay of Plenty.

The results showed that over the 3 years 4 months between the surveys, the western section of the Ohope Beach had no change or only minor increases in sand depth, predominately along the foredune area. In contrast, the eastern section had undergone significant erosion with the loss of up to 1 m in depth of sediment along the middle section of beach, increasing to over 1 m in depth from the eastern beach. In addition, there was erosion in excess of 10 m horizontally from the foredune, which culminated in over 100 m of coastal recession at Ohiwa Harbour Spit (see

Figure 1).

For the beach as a whole there was a net loss of approximately 1,042,000 m³ of sediment over a beach area of 2.01 km². This equates to an average loss of around 0.5 m³ in sand per 1 m² of beach area.

With this type of analysis, LIDAR data, and the products derived from it, are a significant advancement in providing more detailed analysis of beaches than has been possible in the past from beach profiles alone. In fact, LIDAR opens up a new era in coastal mapping by providing a tool that can map short-, medium- and long-term trends in beach dynamics.

*Stuart Stuart Halliday
Geospatial Solutions Ltd
stuarth@xtra.co.nz*

The full report on the analysis of the Ohope Beach LIDAR data can be obtained from Geospatial Solutions Ltd.

**Coastal
News**



Seabed and Foreshore Issue

Although there seems to have been an abundance of media attention given to the seabed and foreshore issue, the matter is rather more complex than most reports would suggest and the outcome is likely to be equally complex.

So should those who are interested in protecting the country's coasts and foreshores be concerned about the present debate over who owns them? Possibly. However, it will probably be years before we know the true implications of whatever emerges from the present political maelstrom. Remember that for decades the ownership of the coastal zone was already thought to be a settled issue.

The courts, at all levels, had always taken the view that the assumption of British sovereignty in 1840 transplanted British custom and common law here. On that basis they decreed that the Crown owned the foreshore and seabed except where it had specifically granted title to others. That view had its origins in a landmark case as far back as 1877 and was reinforced by a 1963 decision over Ninety Mile Beach.

In the political climate of a century ago it can be safely assumed that if there had been any doubt over ownership in the coastal zone the Crown would have legislated to give itself ownership. Indeed, a more recent Minister of Local Government, Dr Michael Bassett, has commented that, "Prior to June this year 99 New Zealanders out of every 100 believed that the land below the highwater mark and seabed belonged to the Crown. I sat on Parliament's Bill Committee for many years, and that was an article of faith; had there been any doubt, we would have removed it."

Midway through last year, however, the Court of Appeal overturned the whole legal structure regarding entitlement to the seabed and foreshore. It did so, not because of any change in the law, but on the basis of a growing body of legal precedents in other former colonies that, except where the Crown explicitly expropriated any land or foreshore, the residual title must lie with the indigenous people. The decision is still causing controversy in legal as well as political circles.

There is a strong body of legal opinion that the law needs to be consistent, that people need to have confidence as to what particular laws mean, and that therefore judges should not blithely overturn longstanding precedents. From that point of view, if the law on foreshore ownership or anything else was to be changed, it should be changed by an elected Parliament and not by appointed judges.

It is possible that the Privy Council might overturn the Court of Appeal decision because the Port of Marlborough - but not the Crown, which was the respondent in the case - has sought leave to appeal. However, the Privy Council decision can by no means be taken for granted. Although the council was once a bastion of legal conservatism, it is now seen as rather prone to making law itself, and it has also been increasingly reluctant to intervene in Treaty of Waitangi cases.

If the Privy Council was to restore the status quo it would be deeply ironic, because it would undoubtedly solve a problem for the Government, yet the Government has recently indicated that it regards the council as an anachronism and has cut New Zealand's ties with it (which is no doubt

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Controlling the Invasion of *Spartina*

The cordgrass, *Spartina*, was initially introduced to New Zealand in the Manawatu Estuary in 1913 in an effort to control estuarine erosion, however, the plant was subsequently found not only to be invasive but also to detrimentally affect estuarine sedimentation and hydrodynamics.

Protrusion of *Spartina* into tidal currents reduces flow velocity causing sediment to deposit from suspension. The plant's root structure forms a dense mat that facilitates accumulation of fine-grained sediment by reducing the occurrence of entrainment. Subsequent accretion further encourages growth of *Spartina*, creating a self-sustaining cycle.

Spartina also invades and alters the character of native plant communities such as mangroves, and salt marsh, previously dominated by species such as the sea rush, and the jointed wire rush. Once established *Spartina* can quickly cover large areas of otherwise open mudflat, drastically restricting feeding opportunities for native fauna, especially birds and fish.

The *Spartina* genus encompasses 14 species, three of which are now established in New Zealand. The species are intertidal, sward forming grasses that grow 6 - 250 cm high, and typically form circular patches. The cordgrass is found throughout the country including the Manukau Harbour, the Marlborough Sounds, and Invercargill.

Two of the main areas with *Spartina* infestations include the Hauraki region - Waikawau Bay, Whangapoua Harbour, Kauaeranga River /base of Firth of Thames, Manaia Harbour, Coromandel Harbour and Tairua Harbour; and the Waikato - Firth of Thames, Raglan Harbour, Aotea Harbour, and Kawhia Harbour.

Gallant NF® Herbicide, a selective grass eradicator, is currently being used to control *Spartina* beds in certain areas. The herbicide is applied during the season of greatest growth, in November and also March, to ensure maximum

eradication occurs. Sites generally need to be sprayed at least three times before total eradication of the plant has occurred.

Gallant was first trialed in 1994 by the Department of Conservation (DoC) who obtained a non-notified resource consent to carry out *Spartina* control trials near Te Waitere in Kawhia Harbour, using various means of applying the herbicide. However, the outcome of these initial trials was not very successful.

The Department of Conservation commissioned the National Institute of Water and Atmospheric



Figure 1: The cordgrass, *Spartina*, has formed thick beds in the estuarine area of Waikawau Bay



Figure 2: Quadrats are used to measure the density of *Spartina* plants at each site.



Figure 3: *Spartina* reduces current flow causing sediment deposit

Research (NIWA) to assess the likelihood and potential extent of sediment remobilisation resulting from the subsequent removal of *Spartina* beds, using Gallant. Field experiments were conducted at Karaka in the Manukau Harbour. Two *Spartina anglica* patches were sprayed and monitored over an 18 month period from 1999 to 2001.

Scott Lambert, a Master student with the University of Waikato Earth Sciences Department, is currently involved in continuing the research into *Spartina* control by focusing on the remobilisation of sediments following *Spartina* eradication in the Raglan, Kawhia, Waikawau Bay and Whangapoua estuaries. The project is being run in collaboration with the DoC and

Environment Waikato and focuses on within site variability; wave attenuation within the site; temporal changes; and inter-estuary comparisons.

Monitoring follows a method that has been designed after recommendations from NIWA. Each selected site is sampled along three to five shore-normal transects, depending on patch size. Each of these transects contain three sampling stations both inside and outside the patch.

The findings so far would suggest that sites which have *Spartina* plants present are accumulating finer grained sediment than those areas without.

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why it decided not to appeal itself). But we should be clear, as many commentators have not, that even if the Court of Appeal ruling stands it would not mean Maori own most of the foreshore. All the court said was that in certain circumstances Maori could take a case to the Maori Land Court seeking customary title to the foreshore.

The Chief Justice, for instance, wrote, "The significance of the determination this court is asked to make should not be exaggerated. The outcome of the appeal cannot establish that there is Maori customary title below high water mark. And the assertion that there is some such land faces a number of hurdles in fact and law, which it will be for the Maori Land Court in the first instance to consider." Later she added that in the specific case before it, in which Ngati Apa were seeking customary title in respect of the seabed and foreshore of the Marlborough Sounds, "Even if we hold that the Maori Land Court has the jurisdiction contended for, I have real reservations about the ability for the appellants to establish that which they claim."

Among other things, a claimant iwi would probably have to show that the area in question was not already the subject of a legal title (which a certain amount of the coastline is), that they had exercised customary rights on a continuous basis right up to the present day (a hard thing to prove, especially in areas where the land is largely owned by non-Maori), and that the common law rights of other New Zealanders (to navigate and fish among others) would not be interfered with. A precedent from the Federal Court of Australia suggests that even if a claimant iwi passed all those hurdles any title granted would very likely only involve the right to "fish, hunt and gather within the claimed area for the purpose of satisfying their personal, domestic or non-commercial communal needs including for the purpose of observing traditional, cultural, ritual and spiritual laws and customs." Furthermore, any decision by the Maori Land Court could be appealed to the Maori Appellate Court and all the way up the system. That sounds a long way

from ownership, as most people would think of it. Given that Ngati Apa had so many hurdles to cross it may seem a little strange that the Government did not allow their case to take its course before deciding whether there was a need to intervene at all.

The Government's intervention has also aroused concerns about the propriety of the state unilaterally extinguishing the property rights of a group of its citizens.

Perhaps surprisingly, the Business Roundtable - not immediately thought of as sympathetic to Maori causes - has pointed out in a submission that, "If Maori can establish customary title to the foreshore and seabed, just compensation would be required for the abrogation of such rights in the same way that the taking of land for public works warrants compensation." If the aim of our society is indeed to have one law for all then that sentiment is hard to disagree with.

It remains, at the time of writing, far from clear what the recently announced Government seabed and foreshore legislation actually entails. National would have us believe that it gives Maori more rights over the coastal zone while many Maori believe the opposite.

Once legislation is passed we can reasonably expect it to be the subject of more court cases, from one side or the other, to establish precisely what it means. Presumably if the outcome of those is not what the Government wants - or if there is a change of Government along the way - we can expect even more legislation and doubtless further court cases as a result.

Meanwhile there is the appeal against the Court of Appeal decision to be dealt with and other foreshore claims in the pipeline. All of which suggests that a final outcome is likely to be both a long way off and far less dramatic than some of the extreme statements from either side of the debate have suggested.

Jim Eagles

(For further information, please contact the Editor on penguins@clear.net.nz)

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What's Hot on the WWW

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Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management

www.coastal.crc.org.au

The Coastal CRC is a collaborative joint venture between 14 core Australian organisations. The purpose of the Coastal CRC is to bridge the gap between science, the community and policy making organisations to enable the effective management and ecosystem health of Australia's coastal zone, estuaries and waterways.

You can subscribe online for the free Coastal CRC coastal research e-newsletter - *Flotsam and Jetsam*.



The World's Coasts: Online

www.wkap.nl/subjects/TWCO

The World's Coasts: Online (TWCO) is an online-only encyclopedia which pulls together the vast data available on coastlines around the world. TWCO provides up to date, detailed information on all coastal environments, and includes thousands of full colour photographs and illustrations of all coastlines covered.

The website features regularly updated contributions from more than 150 coastline experts from all parts of the world.



The Coasts, Oceans, Ports, and Rivers Institute of the American Society of Civil Engineers

www.coprinstitute.org/

The official newsletter of the Coasts, Oceans, Ports, and Rivers Institute of ASCE – Waterways - is available to download on the website.



AAMGeoscan

www.aamgeoscan.com.au

AAMGeoscan (now called AAMHatch) have a newsletter for business and industry on 'airborne laser scanning' that comes out every two months highlighting LIDAR work in Australia and New Zealand.



Earth Observatory

earthobservatory.nasa.gov/Study/Lidar

This is a general interest website with information on using LIDAR for coastal monitoring.



Optech

www.optech.on.ca

Optech develop and sell LIDAR systems. The Optech website provide a number of examples of the application of LIDAR technology.



The International LIDAR Mapping Forum

www.lidarmap.org

The International LIDAR Mapping Forum website is a great place to find out everything that you ever wanted to know about LIDAR. There is also a very good links pages listing many LIDAR resources.

Evaluation of the New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement (NZCPS), gazetted in 1994, was the first national policy statement prepared in New Zealand as part of the resource management legislative reforms carried out in the late 80's and early 90's. One requirement of the NZCPS was that an independent review be carried out within nine years of the NZCPS gazettal.

The subsequent review, submitted to the Minister in January 2004, was difficult, as the NZCPS has no direct influence on use, subdivision or development on land, or seaward of Mean High Water Springs (MHWS) in the Coastal Marine Area (CMA) out to the edge of the territorial waters.

In 1991, the Minister of Conservation inherited responsibilities for various coastal management roles, under the Resource Management Act 1991 (RMA) provisions, for a number of reasons.

- 1 The Minister of Conservation is the agent of the Crown concerned with protecting the Crown's national interests in the land of the Crown in the Coastal Marine Area (CMA). In 1991 when the RMA was enacted, the Minister of Conservation's involvement reflected an expectation by the public that beaches and the sea should be common property resources available to all New Zealanders.
- 2 The seabed and the foreshore are also areas of national importance because of Maori concerns about the Crown meeting its obligations under the Treaty of Waitangi, in relation to the management of the CMA.
- 3 Through the enactment of the RMA, the Department of Conservation's (DoC) Harbour Act functions were transferred to regional councils and territorial authorities in 1991. The Minister of Conservation retains some responsibility because there was a concern in 1991 that regional councils did not have the skills or expertise to take on this new policy role without national policy direction.
- 4 It is a principle (accepted through the Resource Management Law Reform process) that there is a national community of interest to be represented in policy-making about the coastal environment, even though local authorities are responsible for day-to-day management of the coastal environment.

The Minister's current roles under the RMA provisions include approval of the NZCPS, approval of regional coastal plans (management of CMA) and as consent authority for Restricted Coastal Activities (RCA), which are processed at the regional level of planning. The Minister is also responsible for deciding how land reclaimed from the sea under the RMA is to be vested in the crown or converted to private property and

tendering of space in the CMA for extraction of sand, gravels and shell.

The 1994 New Zealand Coastal Policy Statement

The purpose of the NZCPS as outlined in Section 56 of the RMA is "to state policies in order to achieve the purpose of this Act in relation to the coastal environment of New Zealand". Section 57 of the RMA requires that there shall be at least one NZCPS in place at all times. Section 58 contains the matters that shall be provided for in the NZCPS:

- (a) National priorities for the preservation of the natural character of the coastal environment of New Zealand, including protection from inappropriate subdivision, use, and development.
- (b) The protection of the characteristics of the coastal environment of special value to the tangata whenua including waahi tapu, tauranga waka, mahinga maataitai, and taonga raranga.
- (c) Activities involving the subdivision, use, or development of areas of the coastal environment.
- (d) The Crown's interests in land in the coastal marine area.
- (e) The matters to be included in any or all regional coastal plans in regard to the preservation of the natural character of the coastal environment, types of activities which have or are likely to have a significant or irreversible adverse effect on the coastal marine area; and areas in the coastal marine area that have significant conservation value.
- (f) The implementation of New Zealand's international obligations affecting the coastal environment.
- (g) The procedures and methods to be used to review the policies and to monitor their effectiveness.
- (h) Any other matter relating to the purpose of a New Zealand Coastal Policy Statement.

The preparation of the NZCPS took several years and after the Section 32 analysis was complete, an interdepartmental committee again reviewed the draft before it was publicly released and put to the Board of Inquiry (BoI) in 1992. At the time of its gazettal in 1994, the NZCPS was the first national policy statement to be prepared under the RMA. It was also and still is the only national policy statement to be also translated into the Maori Language – "Te Kupu Kaupapahere Takutai Aotearoa". After two years of extensive public consultation, the present day NZCPS was gazetted in May 1994. The BoI played an important role in determining content of the NZCPS, the prescriptiveness of policies and the interpretation

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of key terms associated with the NZCPS, such as “Kaitiakitanga” and “significant.

2003 NZCPS Review Methodology

The methodology for a review relied on several types of process including reviews of government reports, analysis of regional and district plans and policy statements about the coastal environment across Auckland, Bay of Plenty and Southland Regions, and workshops with local government and coastal industry and users groups. Reviews of this nature are difficult because NZCPS policies are implemented indirectly through regional and district policies and plans.

The primary objectives of the review is to assess the effectiveness of the NZCPS by:

- examining how the NZCPS policies have been implemented through plans and resource consents;
- consulting with NZCPS users from government, industry and other organisations about the implementation of the NZCPS; and
- making recommendations to the Minister of Conservation for the need, if any, to review, change, revoke any policies in the NZCPS.

The following questions were also asked in the assessment of the effectiveness of the NZCPS:

- Does the NZCPS provide clear and sufficient guidance for the preparation of plans and policy statements at the regional and district levels of planning?
- Does the NZCPS achieve sustainable management of the coastal environment - the purpose of Part II of the Resource Management Act (RMA)?
- How well do the policies of the current NZCPS deal with the emerging coastal issues of New Zealand?
- What is the definition of the “coastal environment”?

Review Conclusions

Consideration of NZCPS effectiveness is difficult because the purpose of the RMA is achieved through a series of plans and policy statements at national, regional and district levels of planning. Therefore, the assessment of the effectiveness of NZCPS policies in achieving environmental outcomes in the coastal environment is dependent not only on the actions of DoC, but also on the philosophy and actions of local government planners and the effectiveness of their policy statements and plans.

Coastal planning capacity in local authorities has developed since 1994, particularly in regional councils. However, feedback from the local government workshops and the review analysis indicate that there is considerable variation in planning capacity between councils, a concern that may be addressed if Local Government NZ coordinates discussion and analysis of coastal

planning topics in its on-line forums (www.localgovt.co.nz).

Effectiveness of the NZCPS

The first NZCPS has been effective in generating debate about New Zealand’s national priorities for coastal management. Along with the RMA, implementation of the NZCPS has also required local government to change the way in which coastal issues are considered in local planning frameworks.

The NZCPS has been effective in changing current practice concerning direct discharges of sewage effluent in the coastal marine area. Restricted Coastal Activities have been implemented where appropriate in regional coastal plans.

The NZCPS has not been changed since 1994. One of the most significant issues to emerge since then is the occupation of space in the CMA for aquaculture purposes

NZCPS policies have generally been effectively implemented through regional policy statements and regional coastal plans analysed in this review. However, the NZCPS has only been partially effective in influencing district plans. The analysis of plans and policy statements revealed that the wording of NZCPS policies is generally reflected in many district plans despite the fact that DoC has not provided the same level of input to district plans as was provided for submissions to regional coastal plans.

The NZCPS is only generally referred to in applications and officer reports about resource consents applications. Judges, in relation to appeals of individual applications, make more detailed reference to NZCPS policies. However, it is not possible to comment on the effectiveness of environmental outcomes given the difficulties obtaining information about resource consent applications.

The poorest area of implementation has been in monitoring environmental outcomes and assessing the degree to which plans and policy statements have influenced environmental results.

Many local authorities are still developing monitoring strategies. It would be useful to provide national guidance to ensure increased consistency between local authority approaches to implementation so that review of national policy statements is more effective.

There is often a reluctance to implement national requirements at regional and district levels of planning because of funding implications. This is one area where responsibilities are blurred at all levels. The national level of policy-making needs to clarify responsibilities at all levels for environmental and plan monitoring as discussed in the Oceans Policy review. A similar situation exists in relation to management of natural hazards. More clarity is needed at the national level of planning, especially in regard to the influence of climate change data on location and

design of public infrastructure around the country.

General Recommendations of the Review

The report makes a number of general and specific recommendations including a recommendation that the NZCPS be reviewed to revoke some obsolete policies, and to provide additional policy guidance required by sub-national levels of planning. The formal review to change the NZCPS should be delayed until Government policy concerning the foreshore and seabed debate and the role of the NZCPS in relation to the Oceans Policy are determined. Any NZCPS policies that duplicate the Biodiversity National Policy Statement should not be revoked until that NZCPS is operative.

Other important issues to debate include:

- 1 Should NZCPS be replaced by the Oceans Policy? The review recommends the retention of the NZCPS.
- 2 How prescriptive should NZCPS policies be? The report recommends that additional prescription is needed, but a balance is needed to retain flexibility at the sub-national levels of planning. Most local authority planners believe that NZCPS policies relating to natural character of the coastal environment need to be strengthened.
- 3 In what circumstances should a NZCPS be prepared? In other words, what criteria need to be met to trigger the process to review an existing NZCPS or prepare a new NZCPS? Many submitters believe that a NZCPS was required to guide analysis to define AMA, which have evolved with Environment Court guidance in a national policy vacuum.
- 4 Could the HGMPA model guide the development of a "place based" NZCPS? The model could assist in dealing with problems associated with achieving integrated coastal management in nationally significant coastal seascapes/landscapes – with community and industry involvement. This could be a process driven by regional communities to meet national objectives about the protection of entire landscapes and seascapes.

Although DoC's implementation strategy for the NZCPS has not been explicitly provided for, the Department has carried out important activities to implement the NZCPS. Action is ad hoc and although the reasons for various activities and guidelines have been implicitly understood within Head Office, they are difficult to trace through DoC programmes and it is not always clear how DoC coastal management outputs relate back to implementation of the NZCPS.

Once an amended NZCPS is approved the Department of Conservation needs to implement a transparent implementation strategy and be more accountable for implementation actions and analysis.

Given the number of areas listed by local government for which national guidance is

needed, it is imperative that national guidance in coastal management is retained. However, national ministries and departments need to identify which areas local government should manage, and then outline programmes for preparing policy and guidelines at the national level.

Other National Reviews

Change in government policy means that some coastal issues may be dealt with in other national policy initiatives at a national level in addition to NZCPS policies. Important policy programmes include the completion of the New Zealand Biodiversity Strategy, the development of the National Environmental Performance Indicators, and the ongoing preparation of an Ocean's Policy for New Zealand.

The most important central government review affecting the future role and content of the NZCPS is the preparation of the Foreshore and Seabed Bill. The current proposal is to vest ownership of the foreshore and seabed in the Crown, integrating all rights and interests within existing systems for regulating activities in those areas. Maori customary rights and interests would be protected through their right to participate – not through ownership rights.

The lack of protection for important marine environments beyond the territorial sea is one of the constraints of existing policy systems, which could be amended through the Oceans Policy Review (OPR). However, the OPR has been delayed by the foreshore and seabed debate. The major strength of the OPR is its interdepartmental character. For example, an Oceans Strategy could provide an overall vision for all management in NZ's coastal waters, information, and data management principles or standards to ensure compatibilities between databases about marine resources, environmental indicators and monitoring requirements.

Non-statutory methods have also changed the implementation of NZCPS policies. Since 1994, regional councils and some territorial authorities have initiated coastcare groups and other community environmental programmes to engage communities, increase people's awareness of environmental problems and achieve landscape restoration. These groups also have the potential to strongly influence the next generation of coastal policy statements and plans.

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Make a submission!

Copies of the Rosier and Jacobson reports will be available online at the DoC website www.doc.govt.nz and the Massey University website www.planning.massey.ac.nz when the report is publicly released by the Minister of Conservation.



Mahia Beach Structure Plan

The recent development of a Structure Plan for the town of Mahia Beach enabled the local community to have a say in the future of their coastal settlement.

Following the work on a Coastal Strategy by Beca Planning and the Wairoa District council for the Wairoa District (some 130km of coastline in the Hawke's Bay), the Mahia Beach Structure Plan was prepared to address residential and development pressures and demand at Mahia Beach township.

The Mahia Beach settlement contains approximately 10% of the Wairoa District's population, at around 900 residents, and is a key tourist destination, with the resident population rising significantly in peak holiday periods. The township is nestled amongst steep hill slopes and cliffs on the northwestern coast of the Mahia Peninsula. The area is characterised by dramatic coastal landscapes and is one of the remaining New Zealand towns with a 'typical kiwi batch' character and feel. The community is close knit with strong ties to local iwi Rongomaiwahine, as well as other iwi including Kahungunu.

The community statement developed through consultation for the township for the Wairoa Coastal Strategy reflects the intimate community relationship - "A unique residential and holiday settlement with a special 'sense of place' and community".

While the Wairoa Coastal Strategy attempts to recognise, acknowledge and provide for the diversity of physical resources, social characteristics and economic aspirations within individual areas and settlements throughout the Wairoa coastal environment, the Mahia Beach Structure Plan identifies key community directions, specific issues, and potential actions and prioritises them. The Structure Plan provides local interpretation of the Wairoa Coastal Strategy.

Prior to consultation, a range of constraints and opportunities were identified for Mahia Beach as well as growth expectations and available space for residential development in the next 20 years. An important part of the community consultation over the last year has been the use of 'ideas catchers' to help the community visually identify their concerns. This consultation also involved discussions in regards to urban growth, development, environmental protection, constraints and public and commercial facilities. There were a range of issues that resulted from consultation, including:

- the protection of iconic landscape values from



Photo 1: Mahia Beach



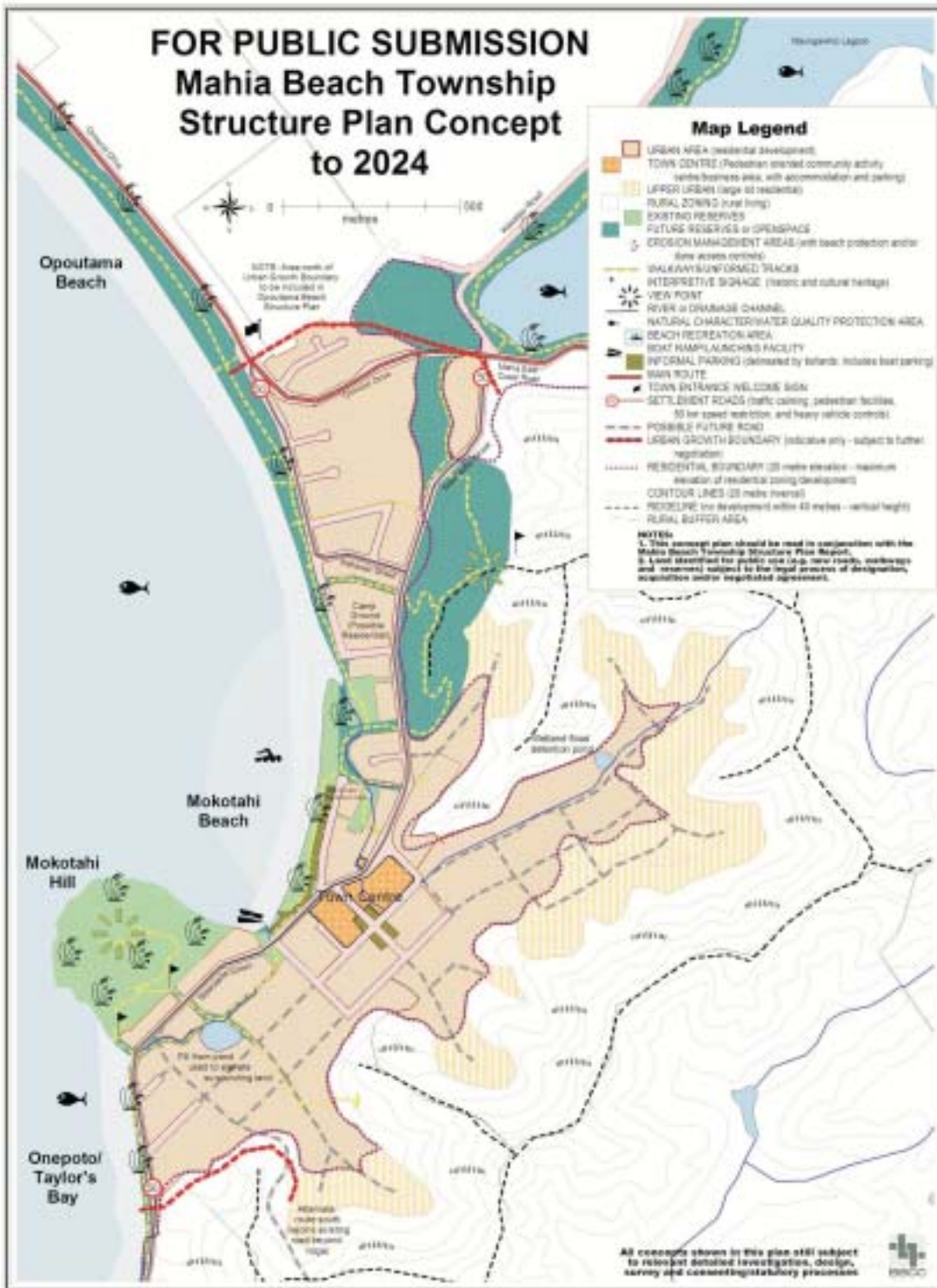
Photo 2: Recreational activities on Mahia Beach

inappropriate development, particularly the open slopes and main ridgelines;

- avoiding ribbon development along the sand dunes;
- addressing concerns over the impact on coastal water quality from degraded septic tank systems;
- providing a refuse transfer station;
- protecting key landscapes, such as Mokotahi Hill, from inappropriate land uses;
- supporting and developing sustainable local economics with a focus on eco-tourism and fishing;
- promoting and supporting protection of the marine resources by the local community; and
- promoting Mahia Beach as a residential settlement and holiday destination with an emphasis on sensitive management of landscape, coastal margins and water quality.

As a result of these discussions the draft Mahia Beach Structure Plan was developed. The Structure Plan identifies urban growth boundaries, as well as residential, upper urban,





The Draft Mahia Beach Structure Plan

commercial, rural and existing and future reserves areas.

The plan also details ridgeline development restrictions, viewpoints, areas of erosion management and locations for interpretive signs.

The Mahia Beach Structure Plan has been a positive step towards creating a community vision for Mahia Beach township and identifying implementation directions for achieving this vision.

The consultation process was also an opportunity to continue to develop the partnership between the community and Wairoa District Council.

The Mahia Beach Structure Plan will be adopted by the Wairoa District Council following the review of the public submissions in July.

Once the Structure Plan is adopted there will need to be a Variation to the Proposed Wairoa District Plan to provide statutory implementation of this local direction for the Wairoa Coastal Strategy.

For further information contact one of the Project Team: Lucy Brake (lbrake@beca.co.nz), Namouta Poutasi (npoutasi@beca.co.nz) or Leo Koziol (leo@wairoadc.govt.nz).



Sandy Bits – News In Brief

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Climate Change Office Coastal Hazards Guidance Manual

A new document Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand is about to be published by the NZ Climate Change Office, Ministry of Environment.

The guidance manual aims to strengthen the integration of coastal hazards and climate change within the land-use and development planning process. The key objectives of the manual being:

- to provide regional and territorial authorities with information on the key effects of climate change on coastal hazards;
- to provide a decision-making framework to assess the associated risks; and
- to provide criteria to appraise and decide on appropriate planning and resource management responses to the risks.

The guidance manual was developed by a team consisting of NIWA, Beca Consultants Ltd and DTec Consultants Ltd, with additional input from Tonkin & Taylor and Duncan Cotterill.

The guidance manual will be available in electronic form via the web from late May 2004 at www.climatechange.govt.nz/resources/local-govt/index.html. For further details, contact info@climatechange.govt.nz

Managing Coastal Hazards

Managing Coastal Hazards was the topic for a short course held in the Alcamo Hotel in Hamilton on May 4 and 5 2004. The course was attended by 24 people from regional councils, territorial authorities, government departments and consulting organisations.

The short course discussed the main coastal hazard drivers and the potential impacts of climate change on these drivers, coastal erosion and inundation, coastal morphodynamics, cliff erosion, coastal mitigation options, the human dimensions of managing the coast and the realities and challenges of mitigating coastal hazards. Group projects and a field trip to Raglan to look at coastal hazard mitigation measures (e.g. a proposed seawall in



Bow St and sand fences around the local marae), illustrated further the issues being discussed.

The course was run by NIWA under the auspices of the NIWA/GNS Natural Hazards Centre, with support in the delivery of the course from Willem de Lange, University of Waikato and Jim Dahm, Eco Nomos Ltd.

The Managing Coastal Hazards course will be offered again next year. Details of this, and other short courses available through the Natural Hazards Centre, are available via the website at: www.naturalhazards.net.nz/courses For further details contact Rob Bell (r.bell@niwa.co.nz).

Oceans rising faster near coasts

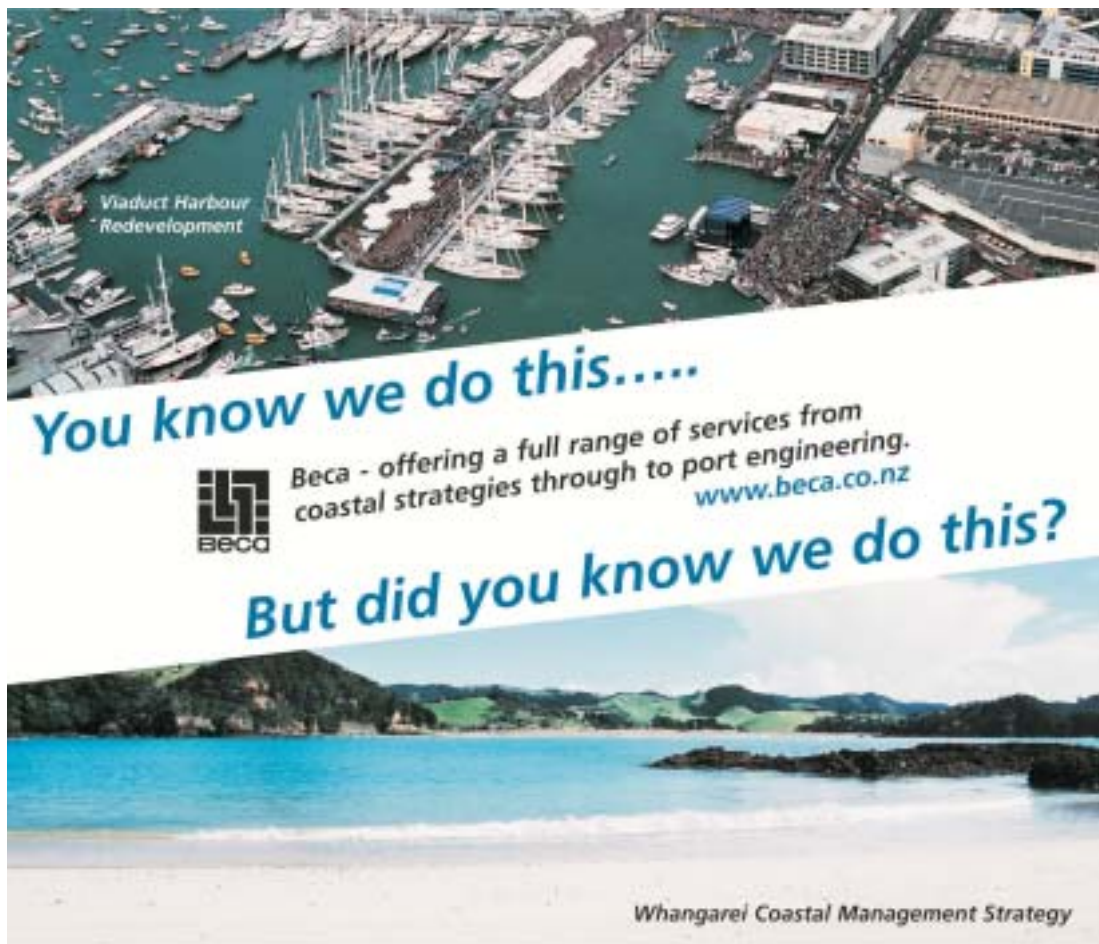
It has recently been confirmed - thanks to satellite measurements - that the sea level is rising faster near the coast than in the mid-ocean. The Proudman Oceanographic Laboratory, in the UK, has established a system to measure changes in sea level consisting of bouncing microwaves off the ocean and timing how long they take to come back. Using this method it was calculated that between 1993 and 2002 the water level within 100 kilometres of the coast rose by an average of 3.7 millimetres a year, instead of the general sea level rise of 2.8 millimetres, as a result of global warming. The associated problems suggested by the difference between the sea level on the coast in comparison to the ocean include flooding and associated coastal zone damage.

New Scientist

Nutrients Threaten Coastal Waters

The United Nations (UN) Environment Programme recently released a global outlook report which claims that excessive nutrient levels in coastal waters are rapidly becoming one of the world's greatest environmental problems. Excessive nutrients in coastal waters trigger blooms of microscopic plant algae or phytoplankton. As the algae die and rot they consume the oxygen in the surrounding water and ultimately suffocate all local sealife. The nutrients, mainly nitrogen but also phosphorus, originate from heavy use of agricultural fertilisers, vehicle emissions, industrial pollutants and human waste. The nutrient triggered algal blooms were especially detrimental to both recreational and commercial fisheries stocks as many fish species spawned and spent their early lives in coastal waters where the blooms were most common. Effected areas are said to have doubled around the world during the last decade with some extending more than 70,000sq km. The UN is urging nations to cooperate in reducing the amount of nitrogen entering coastal waters by cutting back on fertiliser use and by planting along feeder rivers to reduce runoff and soak up the excess nitrogen.

The Independent, 20 March 2004



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..

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

The Next Era for Cam-Era

Coastal changes are being monitored around New Zealand using the state-of-the-art automated video system "Cam-Era". The Cam-Era stations, which each consist of a video system and computer linked by telephone back to a central base station, have been collecting images every hour for a number of years. As a result some exciting phenomena have been revealed, including the way offshore sandbars move, split and merge, the occurrence of rip currents and the presence of erosion "hotspots" forming along the shoreline.

Despite decades of research, the immediate response of a beach to wave attack is still difficult to predict, just as it is difficult for surf lifesavers to predict the location and movement of dangerous rip currents. Similarly, predicting long-term patterns of erosion and accretion – which can dramatically affect communities living close to the coast – is a challenging task. Cam-Era is being used to build a database of frequent, long-term, spatially-extensive observations of beach

behaviour at a number of sites that will allow us to create and verify models that can be used to predict these and other aspects of coastal dynamics and change.

There are currently 8 sites in New Zealand being monitored by Cam-Era (see Figure 1, <http://www.niwa.co.nz/services/cam-era/>), which include beaches, rivers and tidal inlets.

Why Cam-Era?

Three key words describe the rationale behind Cam-Era: monitoring, understanding and predicting.

Before the advent of the video-based technique, collection of meaningful information on beach dynamics was nearly impossible. Yearly or even twice-yearly surveyed profiles of the beach are grossly inadequate at capturing natural spatial and temporal variability. Furthermore, the most significant changes occur during and immediately

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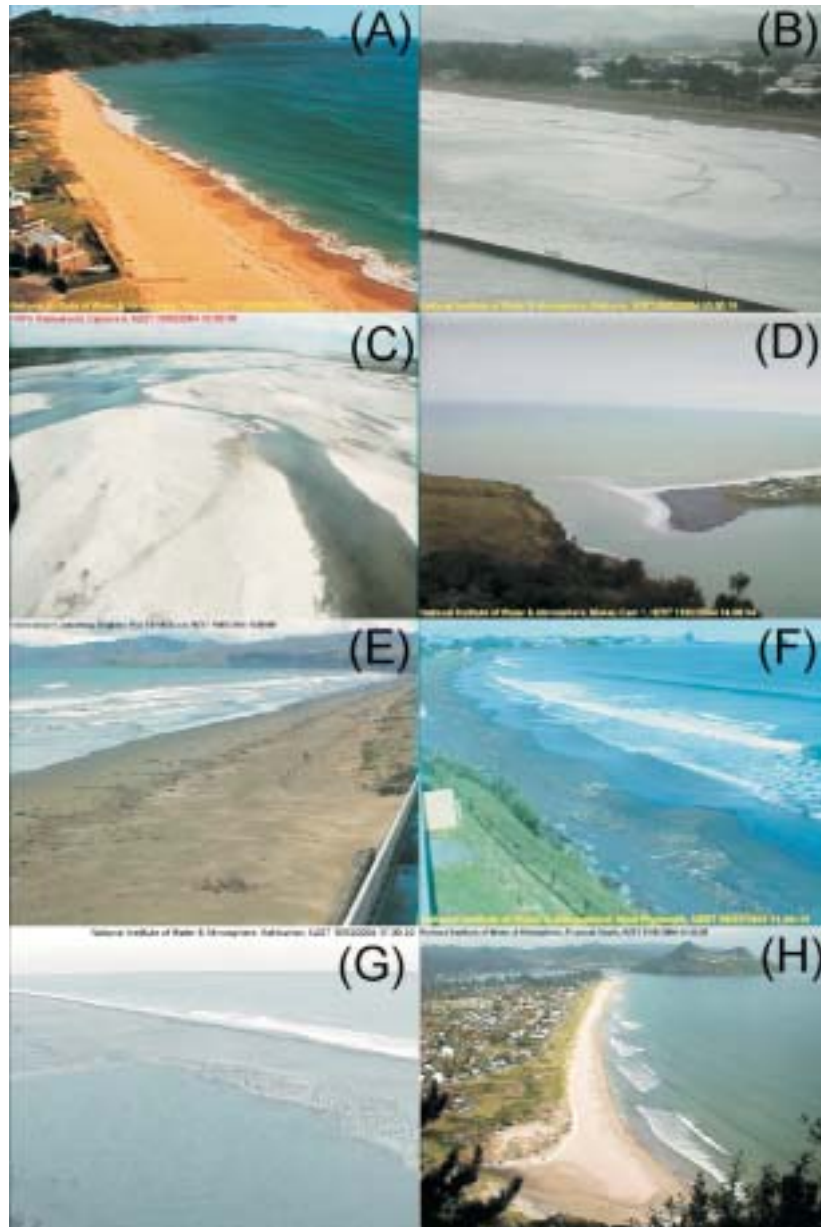


Figure 1: Cam-Era video monitoring at (a) Tairua Beach, (b) Gisborne harbour, (c) Waimakariri River, (d) Mokau, (e) New Brighton Pier (Christchurch), (f) New Plymouth, (g) mouth of the Ashburton River, (h) Pauanui Beach. At each site, the camera is controlled and data processed by a computer. One image per second is taken for 10 minutes at the beginning of each hour (such images will be averaged to facilitate shoreline and sandbar detection). Images are then transmitted through a modem connection to the Hamilton NIWA offices where they are stored and used for analysis. For remote locations where power and phone lines are not available, solar panels and radio-transmission of the video signal to a station in a 5 km radius are operated.

after storms, for which there is usually not enough warning to assemble survey teams, and which are very difficult to work in, in any case. Land-based surveying usually cannot extend much beyond low-tide elevations, which means that sandbar movements, which are known to be the main driver of shoreline erosion and accretion, are completely missed.

In contrast, Cam-Era performs satisfactorily under rainy and sunny conditions, in storms and fair weather, and captures information along the entire beach including the offshore sandbars (see Figure 2).

The next era

Coastal-zone managers and engineers face a difficult challenge in finding a balance between preserving our unique coastlines and satisfying the demands of coastal development. The challenge now, with a large database of images already captured, is to bridge the gap between the Cam-Era researchers and potential end users – in other words, make the data useful and make useful tools from the data.

Recent advances in techniques for analysing video images have opened some interesting new doors. For instance, we can now estimate speed and direction of longshore currents from images, which can then be used to calculate longshore sediment transport rates. We are also able to relate beach volume to the position of the shoreline as seen in an image, from which cost-effective long-term beach monitoring can be implemented (Figure 3).

Other techniques are being developed to the wave climate that impinges on the beach and even infer nearshore bathymetry from video images (Figure 4). Furthermore, the advent of digital technology will increase image resolution and confidence in the analysis of video images.

Video systems, like Cam-Era, also provide a

database necessary for scientists to test innovative techniques to shed light on beach behaviour. (Recent work includes the use of empirical orthogonal functions or wavelet analysis.) This enables the inference of time and spatial scales for changes in beaches and river mouths, in order to grasp the behaviour of rip currents and try to forecast the conditions under which they are more prone to appear or change orientation. For example, in the case of beach nourishment schemes, the use of video cameras to: (a) monitor beach evolution will measure how much of the nourished sediment is lost and how fast the shoreline retreats; (b) test numerical models and their effectiveness to predict shoreline change; (c) quantify sediment loss offshore or accumulation in surf-zone sandbars (shoreline and sandbar are easily detectable using video systems).

Such advances in analysis techniques and prediction demonstrate the maturing of Cam-Era and the promise of applications that can be usefully exploited by coastal managers. Some indications that this is already happening are provided by other countries, where camera systems are used to support decision making (<http://www.wrl.unsw.edu.au/coastalimaging/public/index.html>) or where entire research projects (<http://coastview.ims.plym.ac.uk/index.html>) focus on developing and improving video-image analysis to satisfy the needs of coastal management.

Australia has adopted this new technology particularly quickly, and results are being acknowledged worldwide. For instance, a network of 16 video cameras is being used to regulate a sand-bypass system that ensures continuing supply of sand to Australia's southern Gold Coast beaches, which include some of the most spectacular surf spots in the world.



Figure 2: The 10-minutes averaged image allows detection of sandbar (seaward circles) and shoreline (shoreward circles). The sandbar location is assumed to correspond to the location of maximum wave breaking intensity while the shoreline is detected using an algorithm that captures the difference between the sand and white foam associated with the wave run-up.



The new era in Cam-Era research will focus on expanding the monitoring systems value to coastal management and planning. Some examples of current and developing applications include monitoring the performance of engineering structures, tracking sandbar movements at harbour entrances as a guide to navigation, evaluating the effectiveness of beach nourishment schemes, tracking and predicting erosion “hotspots” along a coastline, evaluating the performance and down-coast effects of artificial surf reefs, developing coastal-erosion indicators and early warnings, and real-time monitoring.

With an existing database and new analysis technologies, coastal scientists, managers, planners and engineers can now work together more effectively to realise the potential of video cameras in managing and utilising our beaches.

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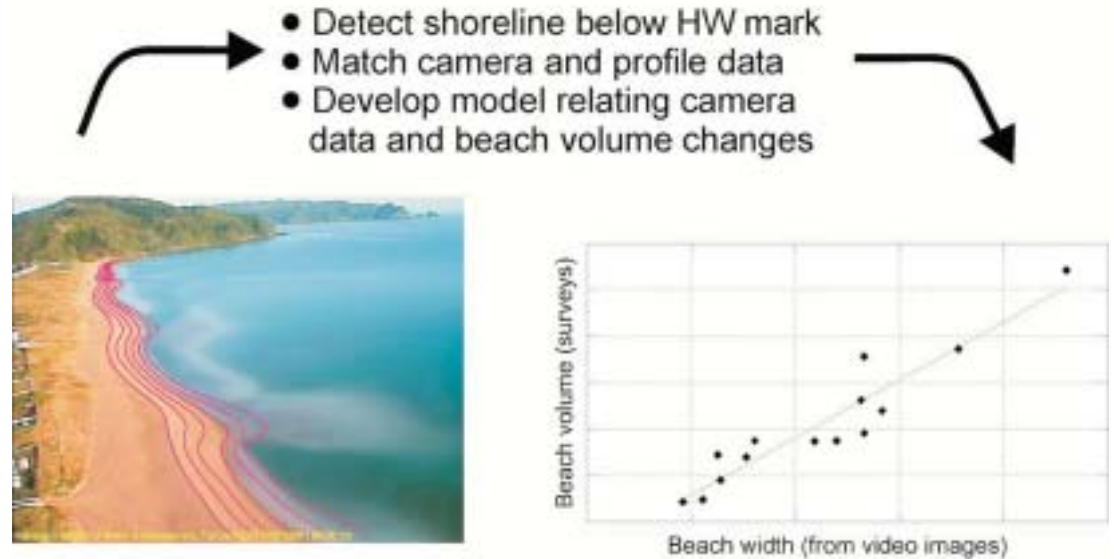


Figure 3: Detection of beach volumes from video observations.

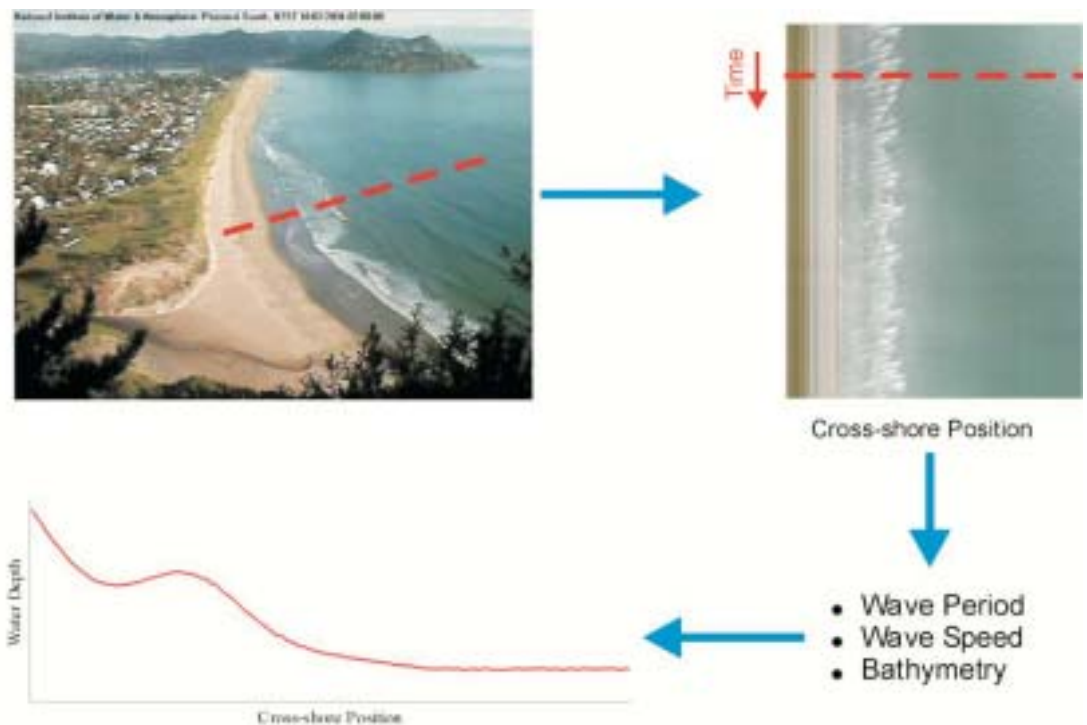


Figure 4: Sequences of snapshots are used to collect high-frequency information along a cross-shore transect of the video image (red dashed line). Analysis of time evolution of such data can lead to estimates of wave period, wave speed and, ultimately, even of the bathymetry across the sampled transect of the video image.