

Coastal News

Newsletter of the New Zealand Coastal Society

A Technical Group of IPENZ

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Contents

Sustainable Coastal Management — Measuring Progress 2

How Sustainable Sustainability? 3

Inundation Protection for Moanatairi Subdivision, Thames 5

New Zealand Beyond the Beach 5

Synopsis of the New Zealand Coastal Society Committee Meeting 6

Upcoming Conferences 6

Workshop on the Vulnerability of Port Structures 7

Obituary: Professor David Wilkinson 8

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What's Happening with Sea-level Rise?

After the hype a decade ago, what is happening with long-term sea-level rise? In 1989 John Hannah (now University of Otago) completed an analysis of long-term sea-level records from the four main ports (Auckland, Wellington, Lyttelton and Dunedin). This analysis revealed linear rises in secular sea level (relative to land) of 1.3–2.3 mm yr⁻¹ which is consistent with the eustatic (or global) sea-level rise in the range 1–2 mm yr⁻¹ over the past 100 years. So what has happened in the decade since 1989? Recently NIWA researchers updated the analysis for the last 100-years of record from the Port of Auckland tide-gauge to find out (Bell & Goring, 1999). Re-checked sea-level data from the port back to 1947 were supplied by the RNZN Hydrographic Office and included in the re-analysis.

It appears that global sea level has been steadily rising by 1-2 cm per decade, and will continue to rise. However regionally, at least

around northern New Zealand, sea-level rise has levelled off (Figure 1) since the climate regime shift in the mid-1970s (Salinger & Mullan, in press). The almost static trend in mean sea level since then is due to persistent and more prevalent El Niño events (see lower time series in Figure). During El Niño episodes, regional sea levels are depressed lower than normal on a year-by-year basis around the North Island. (Conversely during La Niña episodes, annual sea levels are elevated.) Therefore the persistent period of El Niño events kicked in by the 1976 climate regime shift has kept sea levels lower than expected and effectively masked the *ongoing* global rise in sea level.

Recent work by northern hemisphere oceanographers and climatologists have uncovered an interdecadal oscillation in the climate regime of the North Pacific, sometimes referred to as the

continued on page 4

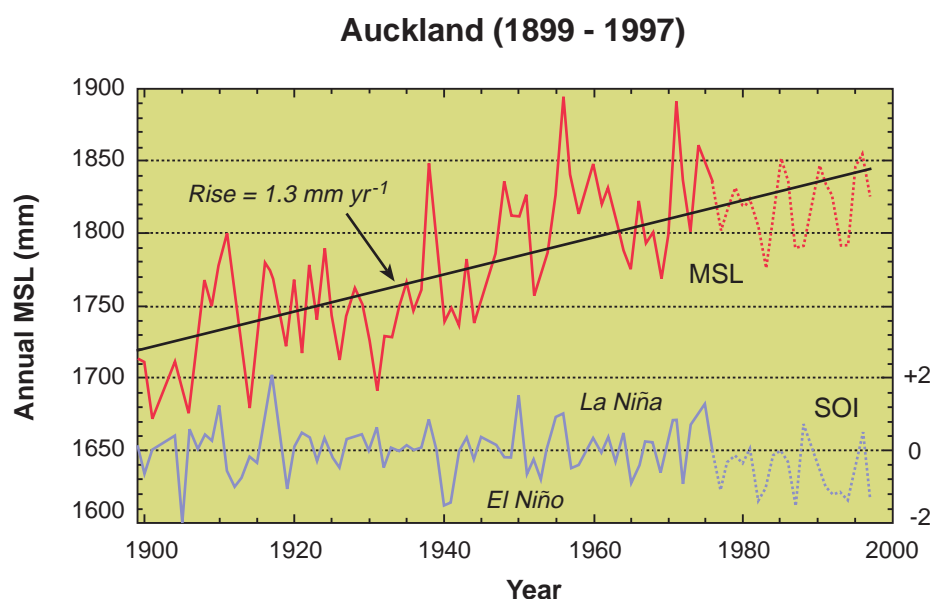


Figure 1: Annual MSL for the Port of Auckland and the Southern Oscillation Index (SOI), showing linear trend in sea-level rise. Dotted lines emphasise the recent period since 1977 of unusually persistent El Niño events

Sustainable Coastal Management – Measuring Progress: Coastal Society Seminar: 29/30 October 98

Coastal News

Eighty-six people gathered in the surf club buildings on the Mount Maunganui beach-front for the Society's 5th annual seminar. The seminar continued the focus of recent seminars on sustainable coastal management, looking at the theme "Measuring Progress." Particular attention was given to the role of Environmental Performance Indicators (EPI's) in monitoring sustainable coastal management.

Staff from MfE outlined the national EPI Programme and indicators proposed for coastal and marine environments, with Dr Beat Huser (Environment Waikato) and James Low (Tauranga District) representing regional and district council perspectives. Professor Kerry Black (NIWA) and team emphasized the important role of science and technology, using the example of the *Cam-Era* computer-controlled video monitoring project and its application to coastal monitoring.

Particular emphasis was also placed on facilitated discussion and workshops to bring together some of the key threads and themes.

On day 2, staff from Tauranga District Council and Environment Bay of Plenty guided a wide-ranging field trip looking at local coastal management issues.

The following are some of the key thoughts arising from the presentations and discussion.

Indicators and their role in coastal management

- Environmental performance indicators are intended to effectively measure and assess "how well we're doing" in terms of sustainable coastal management; i.e., the essential aim is to measure management effectiveness, not environmental change.
- A strategic approach is central to the concept, with indicator development driven by key management goals and objectives (as identified

by policy documents and communities).

- Monitoring coastal management requires more than just data collection. To be effective, it must include reporting back and have appropriate links to policy review and to action ("management response"). As such, decisions on action thresholds ("what is acceptable" and "when do we need to act") are critical elements of indicator development.
- Good indicators bridge the gaps between science, policy makers and communities, empower the public and increase the accountability of decision-makers.
- Building in-house ability is critical to the success of indicators, particularly for TLA's (many of which do not have a legacy of information gathering).
- Community participation and information is central to the success of indicators.

Practicalities and Cost-Effectiveness

- Budgets and other resources will place real limits on how many indicators can be picked up by management agencies such as RC's and TLA's. It will not be possible to measure every policy/objective (too many policies or plans?).
- Many policies are not smart and do not define end points. Indicator development can be a good reality check on policies!!
- Risk management will be important in prioritising indicators – target effort where it makes the most sense to reduction of risk. Important to also consider "what will it cost if we don't do it?"
- Technology and innovation can reduce costs and improve effectiveness. Indicator development should not be limited by what it is possible to measure with existing technology.

What are we measuring?

- Information is the basic currency of monitoring and needs are huge - but the right information at the right time and in the right form. Indicators need to be supported by *targeted* research.
- The age old problem of trend vs variability will remain. Indicators need to be assessed in terms of their ability to detect trends and the scale of change it is desired to detect. In some situations, the ability to separate human induced and natural changes will also be important.
- Much change has already occurred and the choice of indicators and "action thresholds" needs always to consider what has already

PCP '97 PROCEEDINGS PRICE SLASHED Special Offer to Coastal Society Members

To clear the remaining few copies of these remarkable 2-volume sets (1100 pages, 180 papers) of Proceedings from the Pacific Coasts and Ports Conference, held in Christchurch in September 1997, the sets are being offered to C S members at a special price of \$70 including GST, packing and postage. For further details contact John Lumsden
Phone (03)364-2219, Fax (03) 364-2069
Email j.lumsden@cae.canterbury.ac.nz.

occurred.

- The benefits of aggradation vs lots of separate measurements are important considerations – either or both may be required in different situations and for different purposes.
- It is better to have a little information on a good indicator than a lot on one that is not particularly useful. Avoid the trap of choosing indicators simply because of ease of measurement.

Roles

- National co-ordination seen by all as critical to cost-effectiveness and consistency.
- Final indicators to be packaged in a way that roles and responsibilities are clear.
- While diversity is a real strength, duplication must be minimised – particularly as data capture can also be expensive in the coastal zone.

It was agreed that effective inter-agency partnerships are critical to cost-effectiveness. Environment Waikato are presently involved in a pilot study, funded by SMF, looking at regional integration and co-ordination of monitoring and indicator development (contact: Dr Beat Huser).

The informal and participatory format, which characterises Coastal Society events, enabled frank

and open discussion and most folk valued the day. For many it was also their first introduction to the concept of indicators and the EPI Programme, with most now on the mailing list.

However, any thought that we were on the verge of sustainable coastal management was shattered by the well-planned and thought-provoking field trip on day 2. Much that was positive was seen. However, proceeding southwards from the high-rise at Mount Maunganui along the ever-extending stretch of urbanised shore, we all became only too aware that the coast is shaped by more significant social and economic forces than policies and plans (or coastal management practitioners!). Discussions revealed similar pressures and issues along much of the North Island east coast – with undeveloped beaches rapidly becoming an extinct species. At the end of the day, James Low had us standing at the (present!) southern limit of Papamoa's urban strip pondering the future of the now small remaining length of "undeveloped" shoreline. Hope was not abounding! At the end of the day, one participant (who apparently presumed "government" had everything under control!) told me it was the most depressing field trip she had ever been on!! For all of us, a useful wake-up call.

Jim Dahm

"How Sustainable Sustainability?" (2) Notes from a Vacated Chair

In the last *Coastal News*, I tried to wax eloquent about some of the progress being made in promoting the concept of sustainability.

Words, Conferences, and Agenda 21 are good in theory but what are we *doing* about it? For example, did you respond to the request in the last newsletter for your views on the summary of the IPENZ Sustainable Management Action Plan?

On a more positive note, the 1st Australasian Environmental Conference will be held on July 10-14, 1999 in Auckland, in parallel with the IPENZ Technical Conference. The thrust of the July Conference is unequivocally sustainability, and extracts of coastal relevance will be included in a future coastal news.

The initial drive for this event came from society member David Wilkinson, and it was with deep regret that we learned of his untimely death in December in Hong Kong. His enthusiasm and charisma will be sorely missed.

More immediately, Ministry of Research Science & Technology is sponsoring "Science for Sustainability" workshops in April in the main

centres. The following "thought provokers" suggest they could be topical for coastal folk:

- International drivers: less and less control of our destiny and by implication of our independence. How timely the moves to control our EEZ (but with frigates?)
- Responsibility for waste, e.g. polluter pays, should at least benefit our coast?
- Transport – NZ "leads" the world with the transport sector the largest single source of gross CO₂ and the fastest growing source of emissions.
- Sustainable development: Should NZ focus more on integrating economic and environmental policy as well as minimising wastes, pollution and other "nasties"? It has been postulated we could reduce energy consumption and resource use to 10% of now and still retain our wealth!

As a final plug for sustainability, I offer you Sir Francis Drake's prayer before taking on the Armada, after finishing his game of bowls (a

continued on page 4

continued from page 1

Pacific Decadal Oscillation, which also appears to affect the South Pacific (Salinger & Mullan, in press; Goring & Bell, in press). This decadal oscillation seems to accentuate or curtail the effect of El Niño and La Niña events depending on its phase. The last phase change of the decadal oscillation, prior to the mid 1970s, occurred in 1950, which also coincided with the a relatively rapid rise in sea level at Auckland (see Figure).

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). It is charged with assessing the most up to date scientific, technical and socio-economic research in climate change. The IPCC produced major assessment reports in 1990 and 1995, and their Third Assessment Report is scheduled for completion in 2000. The 1995 Report contains model projections for increases in global sea level for various CO₂ emission scenarios, ranging from about 20–86 cm by 2100 or 7–39 cm by 2050 (Warrick et al. 1996). The year 2100 projection of sea-level rise for the mid-range emission scenario (about 50 cm) is about 25% lower than the earlier IPCC 1990 “best estimate”. Also, they concluded that regional sea level changes might differ from the global mean value, which is well illustrated by the result in the Figure.

Where to from here? If there is another climate regime shift, then more La Niña’s could show up. This scenario would then see regional sea-levels rising again over the next decade or so.

Annual MSL for Port of Auckland and the Southern Oscillation Index (SOI), showing linear trend in sea-level rise. Dotted lines emphasise the

continued from page 3

slight coastal connection!).

O Lord, when Thou givest to Thy servant to undertake a great matter, help him to remember that it is not the beginning of it, but in continuing of the same until it be utterly finished wherein lieth the true glory.

In conclusion may I commend to members our new Chairperson Victoria Caseley. She brings to the position a wide experience in planning from her consulting work both in UK and NZ, and a fresh approach to the chair, stimulated no doubt by that country lifestyle and her new position as Planning Manager at Waimakariri District Council. All the best Victoria.

John Duder

recent period since 1977 of unusually persistent El Niño events.

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Robert Bell, NIWA, Hamilton

Whats hot on the WWW

Tides and weather

Want to check out the weather and extended forecasts, local tides, Sun-Moon-Fishing in NZ then try:

www.press.co.nz/weather/tides.htm and
www.press.co.nz/weather/weather.htm#RegTides

Ocean swell

Check out the swell height and direction via WAM Forecasts for NZ and the Globe and information on La Niña and El Niño, through the US Navy’s Fleet Numerical Meteorology and Oceanography Center (FNMOOC) at:
http://152.80.56.202/index_pub.html

WANTED!!

Have you always wanted to do your bit for society? Now is your chance!

The Coastal Society is seeking an Editor to compile and construct newsletters.

Responsibilities of the position will be discussed, as will remuneration.

If you are interested, please send an e-mail to
Sharyn.Westlake@opus.co.nz

Inundation Protection for Moanatairi Subdivision, Thames

The Moanatairi subdivision, on the Thames foreshore, is located on reclamation undertaken in the 1960's. The subdivision has been plagued by drainage problems. The lowest area was also completely inundated by coastal flooding on two recent occasions (July 1995 and January 1997), with damage to over 30 properties. Tonkin & Taylor were engaged by Thames Coromandel District Council (TCDC) to rectify the problems of sea flooding and rainfall ponding, to a 1/50 year design standard for non-coincident events.

The solution, now effectively complete, has essentially entailed raising and waterproofing the existing permeable rockfill sea wall around the main subdivision, and providing a pump station for local catchment rainfall when it exceeds the capacity of the existing gravity drainage system. The solution reflects the confined area available for developing an effective design.

Setting extreme static water levels under storm surge, plus allowance for wave runup, have been key elements in the design of the inundation protection. Tonkin & Taylor Ltd have worked closely with Environment Waikato and TCDC to develop appropriate design standards from available information. The sea wall embankment crest height has been generally set at 3.5 m above the local Tararu datum (approximate mean sea

level), the design level used for stopbanks in the Hauraki Plains area. A 600 mm timber parapet wall gives further protection against wave runup over the sea wall crest, reflecting the more exposed location of the reclamation.

The design levels will also be reviewed as part of the operation and maintenance of the subdivision protection works in the light of future data based on ongoing Environment Waikato water level recordings and wave analyses.

For Kuranui Beach immediately to the north, the selected design solution has been more "natural". The beach itself has rapidly aggraded due to the groyne effect of the subdivision and previous reclamations. Hence there was material and space available to enable the back-beach "dune" to be built up to absorb the main wave uprush. A graded swale behind the dune channels local stormwater and any dune overtopping to a slightly more sheltered outlet channel maintained at the north end of the beach. A lower inland bank protects the subdivision and roads from swale seawater. Stormwater drainage previously to beach outlets now exits into the swale drain, through upwelling manholes fitted with flapgates or 'Tideflex' rubber valves.

John Duder, Tonkin & Taylor Ltd



Advance Notice: Coastal Society Seminar

What: 'Coastal Conflicts – Smoothing Troubled Waters'

When: 16/17 September 1999

Where: Te Papa, Wellington

A scintillating programme is being created by the Wellington CS crowd. This will include a trip to the beach (or two!) so plan to be there!

New Zealand Beyond the Beach

It is not surprising that most of us tend to think of New Zealand as being bounded by its coastline; ie., the various bits of land that appear above the sea. This is, after all, what appears on maps and about which we have been taught.

There is, however, a great deal of New Zealand that lies beneath the sea and includes the continental shelf. This area, which is more commonly referred to as New Zealand's Exclusive Economic Zone or EEZ, is vast and is said to be the fourth

largest in the world. It is more than 20 times the land area or, in other words, some 95% of continental New Zealand can be said to lie beneath the sea.

Apart from fishing, we have traditionally focused on the land in our use of natural resources. Except in a few areas we have only limited knowledge of the enormous opportunities that lie under the sea. The sea bed is un-

continued on page 8

Synopsis of the New Zealand Coastal Society Committee Meeting held on Friday 12 March 1999

Coastal News

An afternoon meeting of the Coastal Society Committee was held in Wellington 12 March 1999. Current committee members are: Victoria Caseley, Ken Murray, Terry Hume, Harvey Brooks, Sharyn Westlake, Eric Verstappen, Fred Smits, John Lumsden, Kevin Parnell, John Duder, Ewen Henderson, Peter Atkinson, Richard Reinen-Hamill and James Low. Some items of interest from this meeting are:

- The Coastal Society (CS) will be providing financial support to the Earthquake Society Roadshow to be held in the first week of May in Auckland, Wellington and Christchurch – watch this space and your e-mail (IPENZ e-zine).
- The CS has funds of about \$50,000, and a preliminary financial overview was tabled for 1999 finances.
- The newsletter should be published every 3 months – an editor is sought. Regional contacts are required to contribute snippets of past and future events. A photo competition and random prize draw for authors is a possibility too. If you would like to be involved, please e-mail Sharyn.Westlake@opus.co.nz. Following newsletters to be at the end of October 1999 and the end of January 2000.
- Several ex-members are being struck off the membership list for non-payment of fees. This is avoidable for a small sum paid annually!
- The CS is anxious to increase services to members. The question was raised about what service to provide? Please let us know what you would like.
- Archive generation is almost complete. The location of the archive is to be decided. Options are the Turnbull Library, Auckland University or Canterbury University.
- A Two Year Development Plan was tabled. This requires further development.
- A policy statement on how CS will deal with media was developed. Protocol for this is to be discussed.
- A CS Web Site is currently being developed.
- The Annual Coastal Society Seminar is to be held in Wellington on 16th/17th September 1999 at Te Papa. Theme: 'Coastal Conflicts – Smoothing Troubled Waters' – keep this date free.
- A submission was made to MfE on Coastal Indicators.
- Welcome to Jo Fagen, who has recently joined the CS Committee. Jo works at the Wellington Regional Council.

Conference Announcements

ISC 2000: International Coastal Symposium 2000

Rotorua, New Zealand, April 24 - 28, 2000

ICS 2000 commencing on Easter Monday of the year 2000 is the 6th in a series of International Coastal Symposia initiated by Per Bruun. It is a multi-disciplinary international symposium convened for scientists, engineers, planners and managers to discuss the latest advance in the science, engineering and environmental issues of coastal processes. The symposium will provide a high-level technical forum for exchange of information among the fields of coastal science, engineering and environment. The Conference provides a forum for the final meeting of SCOR Working Group 106 on Muddy Coasts, and for a special meeting of the Commission on Coastal Systems of the International Geographical Union. The theme of the symposium, "Challenges for the 21st Century in Coastal Sciences, Engineering and Environment" is chosen to promote research and understanding of coastal sedimentary

processes and associated issues to meet the challenges for the 21st century.

Key Dates:

1 November 1999: for submission of abstract
 15 December 1999: notification of acceptance
 1 February 2000: submission of full paper in correct JCR format

For more information contact:

ICS 2000

c/o Professor Terry Healy, Coastal Marine Group, Department of Earth Sciences, University of Waikato, Private Bag 3105, Hamilton, New Zealand

email to: ics2000@waikato.ac.nz

www site:

www.earth.waikato.ac.nz/ics2000/ics2000.htm

ICCE 2000: 27th International Conference on Coastal Engineering – "Coasting Ahead"

16 - 21 July 2000 Sydney, Australia

Organised under the auspices of the Coastal

Engineering Research Council of the American Society of Civil Engineers (ASCE) and by the Institution of Engineers Australia.

Original papers are invited on: 1. Coastal Oceanography and Meteorology; 2. Coastal Sediment Processes; 3. Shore Protection; 4. Coastal Structures; 5. Coastal Environment; and 6. Dredging, Navigation Channels, Harbours and Ports.

Summaries should be mailed by the 1 June 1999.

For more information contact:

Dr Billy Edge Secretary, Coastal Engineering Research Council Ocean Engineering Program Texas A&M University, College Station TEXAS 77843-3136 United States of America.

Check out the ww site at:
www.mhl.nsw.gov.au/www/icce2000.html

Conference: Coastal Zone Canada 2000: Coastal Stewardship

Saint John, New Brunswick, Canada 17-22 September 2000

Continues a useful series of biennial conferences which commenced in 1994 looking at integrated coastal management. The conferences are designed specifically to facilitate the participation of all delegates and a number of kiwis have attended past conferences. Recognising that our present coastal management practices are unsustainable and that a change in course requires more than technical adjustments, the conference argues a whole new way of thinking is required. In particular, that the paradigm of exploitation is being replaced with paradigms engendered in the term stewardship.

The conference incorporates keynote speakers, presentations and case studies related to each of the following Conference sub-themes:

- Aboriginal practices - providing opportunity to learn from traditional aboriginal coastal practices and stewardship;
- Community-based actions - analysing selected initiatives to identify the factors which promote or hinder successful stewardship in the coastal zone;
- Coastal Health - encompassing all elements of coastal resource management demonstrably linked to the quality of the marine environment; and
- Oceans governance - looking at the maze of authorities, institutional arrangement and policy directions at play in the management of coastal and ocean activities.

If you would like more details check out the web site at www.gov.nb.ca/dfa/czc-zcc2000.htm or E mail: czc2000@gov.nb.ca. Jim Dahm (jimd@wairc.govt.nz) and Blair Dickie of Environment Waikato also have conference flyers available.

Workshop on the Vulnerability of Port Structures

Dick Carter of Ports of Wellington attended the PEER/Port Industry Seismic workshop in San Pedro, Los Angeles. The Workshop was organised jointly through the California Port Industry and PEER (Pacific Earthquake Engineering Research Centre), a research group representing several Western US earthquake research universities working in partnership with government agencies and industry to achieve earthquake risk reduction solutions.

The purpose of this workshop was to discuss seismic problems being considered by port operators in California and other Western States and to outline research underway or likely to be required. New Zealand was one of only two countries outside of USA represented at the Workshop (the other was Japan). While there was much to learn from the experiences of US port operators who have dealt with the effects of earthquakes on their facilities, there was little New Zealand could contribute by way of recent seismic history at its ports. While many of the structures used in New Zealand are similar to those in US ports, Dick's general impression was that US designers have a level of seismic design expertise specifically for port facilities which (with the ASCE port seismic design manual recently released) does seem to have areas in advance of criteria currently considered in New Zealand.

The research proposed by PEER will consider how both new designs and retrofitting of structures can make them seismic resistant more economically. The level of preparedness as a result of the Engineering Lifelines Groups in New Zealand and the interaction between the ports and the utility and infrastructure providers locally was of interest. There is a recognition that earthquake recovery for ports is very dependent on the ability of that port to get access to the community it serves and vice versa.

If you want to learn more about this workshop or get a copy of Dick's report, then contact Dick by email at dick.carter@portwgtm.co.nz

Coastal News

Obituary: Professor David Wilkinson



The death of David Wilkinson from a heart attack in Hong Kong on 13 December 1998 was a great shock to his family as well as to his many friends and colleagues.

David was born in Sydney in 1944 and obtained an honours degree in civil engineering from the University of Sydney. He then transferred to the University of New South Wales where he completed his PhD. Emeritus Professor Ian Wood, who supervised David's doctoral studies, described him as a dream student as long as the surf was not up.

Post-doctoral positions followed, initially at the National Research Council of Canada Hydraulic Laboratories, and then at the Technical University of Denmark. Returning to Australia in 1974, he was appointed a lecturer at the University of New South Wales and was later awarded a personal chair. In 1995, he accepted a position as Professor of Civil Engineering at the University of Canterbury with special interests in coastal and environmental engineering.

David was a person of many talents, who probably could have chosen any profession he wished but his love of the sea led him to a

distinguished career in coastal engineering. He was an outstanding academic who enjoyed an international reputation for his research, not only among engineers but also among applied mathematicians and oceanographers. Because of his reputation he was consulted widely and was always in demand for conferences and short courses. He had many short-term appointments in a variety of countries including India, USA, Canada, Australia and New Zealand.

During the year before David's untimely death, I had the good fortune to attend his Master of Engineering class in coastal engineering and can attest to the fact that his lectures, notwithstanding their substantial content, were always interesting and delivered in a relaxed manner. He was an inspiring teacher and generous with his time to his students. Always willing to become involved in tasks, often unrewarded, outside the university, he served as a member of the organising committee for the 1997 "Pacific Coasts and Ports" conference held in Christchurch and was a great help to me in the lead up to that event.

Although David's achievements in coastal engineering were substantial, it should not be forgotten that he was also a talented artist and photographer with a great love of the outdoors. He played the flute and the guitar, and enjoyed kayaking and rock climbing. Ian Wood's description of David as a kind and generous man who lived life to the full, and was a special person to all who knew him, is entirely appropriate.

John Lumsden

continued from page 5

charted in detail. It is considered by some to be the new economic frontier.

Under the UN "Law of the Sea" Convention, New Zealand has until August 2006 to claim the extensions to its EEZ, being, essentially, those parts of the continental shelf that extend beyond the 200 mile zone. Agreement on boundaries must be reached with adjacent countries by 2004 to allow a final claim by 2006. Within this time frame, as a country we will need to have substantial documentation in place in regard to mapping and resource identification.

It is inevitable that, in time, there will be increasing pressures to explore and develop our undersea resources, thus raising the need to manage these activities with sensitivity to the environment.

The point in mentioning this is to highlight the need to encourage New Zealanders to think beyond the beach and to consider the opportunities (and difficulties) that lie before us. There is much to be done. Is there a role here for the Coastal Society?

To focus attention on some of the issues, CAE (Centre for Advanced Engineering), assisted by key people from several organisations, including GNS, NIWA and others with an interest in the oceans, is proposing to organise a conference to be held at Te Papa, 12-13 October 1999. Selected people from New Zealand and overseas will be invited to present their views.

Comments on these matters, from members of the Coastal Society, will be welcome.

John Lumsden (j.lumsden@cae.canterbury.ac.nz)