



Coastal news

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Newsletter of the New Zealand Coastal Society

a Technical Group of IPENZ

Contents

| | |
|-------------------------------------|----|
| Canterbury Coastal Storm | 2 |
| Stewart Island Marram Grass | 3 |
| A Guide to Waikato Dunes | 5 |
| Work of Interest | 5 |
| Note from the Chair | 6 |
| Student Travel Scholarships | 6 |
| Strategic Plan for NZCS | 7 |
| Editorial | 8 |
| Coastal Dune Vegetation Conference | 8 |
| Skip Davis Address | 9 |
| Coastal Change: Auckland Region | 10 |
| Coasts and Ports 2003 | 11 |
| What's Hot on the Web | 12 |
| Update on Aquaculture Reforms | 13 |
| Coastal List | 13 |
| Committee Member Profile | 13 |
| Coastal Hazards - Tauranga District | 14 |
| Global Warming to continue | 14 |
| Conferences & Workshops | 15 |
| NZCS Seminar 2002 | 15 |
| NZCS Management Committee | 16 |
| NZCS Mission Statement | 16 |

Extension of controls for development in coastal hazard zones

A recent Environment Court ruling has extended controls on building developments in coastal hazards

zones at Waihi Beach and Pukehina Beach in the Bay of Plenty.

Western Bay of Plenty District Council's decision to place controls on development within the high-risk part of its Coastal

Protection Area in 1998 was challenged by the Waihi Beach Protection Society as being too stringent, and also by Environment BOP claiming the controls should apply to all of the known risk area.

The Environment Court adopted Environment BOP's approach so now all development within the coastal hazard area

will be controlled under the District Plan. Properties that are located within the high-

risk area (primary risk zone) along the beach front will continue to require a discretionary activity resource consent for any development work, and properties in the secondary risk zone will now require a limited

discretionary activity consent.

This is a significant court decision as it continues to support council's role under the RMA to control development in a known coastal hazard area.

For further information please contact Grant Bridgewater, WBOPDC, email: gdb@wbopdc.govt.nz



Rock wall protection works at Waihi Beach

Wanted: Area Co-ordinators for the NZCS

There are exciting things brewing at the regional level within the NZCS. The committee is in the process of setting up a network of Area Co-ordinators who will be responsible for sending out information about upcoming events in the coastal area that might interest our members. They may also organise regional meetings with exciting speakers like the Waikato/Bay of Plenty group have been doing for a while now. To do this, we need your help.

- Are you interested in being an Area Co-ordinator?
- Are you interested in helping organise area meetings with interesting speakers?
- Do you have any hot tips about interesting coastal events, topics or speakers for regional meetings?

If so, email Jo Fagan on jo.fagan@wrc.govt.nz. If you have some information that would be relevant to all NZCS members (e.g. local National Ocean Policy meetings) please contact Jo Fagan and she will pass it on to Area Co-ordinators to distribute.

Canterbury coastal storm event 19-22 July 2001

During the 19th to the 22nd of July 2001, large areas of the Canterbury coastline were hit by the largest coastal storm event in over 15 years. Major storm damage to the sandy beaches fronting the Christchurch urban area resulted in the destruction of hundreds of metres of sand fencing while south of Timaru the high seas overtopped low sand/gravel beach ridges to inundate over 1000 hectares of coastal farmland.

Coastal News



Figure 1: Erosion of sand fences, New Brighton Beach

A slow moving low-pressure system (983hPa) off the Chatham Islands that generated maximum deepwater wave heights of 8.5 metres, combined with perigean tides, contributed to the elevated sea levels and high energy waves.

The easterly wave direction compounded the problem along the Christchurch coastline, as the sheltering effect of Banks Peninsula is negligible for waves from this direction.

An estimated 800,000 cubic metres of sand from the 20km of dunes and foreshore of Christchurch's urban coastline was transported offshore during the storm. Much of this sand had been accumulating in nylon foredune sand fences over the past 6 years. There has only been a very slow recovery of this sand volume due to subsequent storms and a lack of summer onshore easterly winds.

South of Timaru between the Otaio and Waihao Rivers the storm resulted in up to 13 metres of erosion of the mixed



Figure 2: Storm waves under New Brighton Pier

sand and gravel beaches in places. The average annual long-term erosion rate of these beaches is 0.5 metres per year. A one kilometre long stretch of barrier beach fronting the Wainono Lagoon was blown out and lowered by up to 2 metres. This contributed significantly to 1150 hectares of salt water flooding over productive farmland.



Figure 3: Lowered beach section

Saltwater lay over pasture for between 3 days and 2 weeks after the event.

For further information please contact Justin Cope, Environment Canterbury, justinc@crc.govt.nz

Figure 4: Coastal flooding South Canterbury



Instructions for authors

Your contributions to *Coastal News* keep Society members and the coastal community informed about coastal issues. Contributions can be advertisements for conferences or workshops, short news items or longer articles. We prefer articles of a maximum of 400 words (about 1-page in the newsletter), preferably with pictures or diagrams. Submit articles to the Assistant Editor, Lucy Brake, 07 578 0896 (e-mail: lbrake@beca.co.nz).

The impact of Marram grass on indigenous dune flora at Mason Bay, Stewart Island

Marram grass (*Ammophila arenaria*) has been used throughout New Zealand to stabilise active dune systems. Unfortunately it is now naturalised and has spread far beyond the initial plantings to such remote coasts as Fiordland and Stewart Island. The ecological cost of the spread of marram grass has been significant. This article addresses the impact of this species on the ecology and geomorphology of the active dune systems of Mason Bay, Stewart Island.

Mason Bay is a 13 km long bay, on the west coast of Stewart Island, which contains extensive transgressive dune systems that reach 3 km inland in places. Parabolic dune forms predominate. Marram grass was planted at Kilbride, at the southern end of Mason Bay, in the 1930's by the pastoral leaseholder to stabilise the dunes. The species subsequently spread rapidly northwards through phalanx (steady creep) and guerrilla (jump) invasion. In a recent study Anne Jul estimated that the cover of marram grass in the central Mason Bay dunes, between Duck and Martins Creek, increased by over 5000% in the 40-year period 1958-1998. Fortunately, marram grass has not yet reached the northern most dunes, so there is scope for comparing the indigenous species diversity in dunes with and without marram grass.

Four dune plant assemblages are identified in Mason Bay. These communities are characterised by the dominant sand-binding species, substrate stability, the amount of cover provided by sand coprosma (*Coprosma acerosa*), the amount of cover provided by marram grass or pingao (sand-trappers) and species diversity. The characteristic features of the plant assemblages are: (1) Sites with dense marram grass cover with few other species present and a large proportion of bare sand. Pingao is rare. These sample sites include



Figure 1: Shrub dune ecotone on the northern side of the transgressive dune field at Mason Bay



Figure 2: The extensive dune system at Mason Bay reaches up to 3km inland

the stoss (seaward) face of the foredune and active depositional lobes and deflation zones of transgressive parabolic dunes. (2) Sites dominated by marram grass and sand coprosma (*Coprosma acerosa*). Pingao is rare, but there are a large number of indigenous specialist dune species present. There is little bare sand cover because of the high total vegetation cover. These sites, which occur on relatively stable dunes, have contained marram grass for a long time (years to decades). (3) Fore dune sites and parabolic dunes within a few hundred meters of the coast that possess extensive colonies of pingao. Few other plant species are present. Large areas of bare sand are present. This assemblage occurs in the northern most dunes where marram grass is largely absent. (4) Less disturbed sites in the northern dunes that contain pingao, as well as a large number of other indigenous dune species. The total vegetation cover is high.

The introduction of marram grass has caused a drastic decline in the distribution of a number of indigenous dune species within Mason Bay. Species associated with foredunes and adjacent environments have been the worst affected. Three-quarters of the foredune species noted by Leonard Cockayne in 1908 have disappeared. Sand tussock, *Euphorbia glauca* and pingao appear to be the plant species most effected by the competitive ability of marram at least in the short term (years). The cause of *Euphorbia* decline could be mammalian grazing or changes by marram to the sand budget resulting in burial.

It is likely that the changes in the morphology of the dunes at Mason Bay over the last 40 years appear to be, at least in part, in response to the change in the dominant vegetation cover.

Marram grass invasion has altered the morphology of foredunes and adjacent parabolic





Figure 3: Photograph of stable pingao-dominant plant community at Mason Bay

dunes established in conjunction with pingao. Leonard Cockayne visited Mason Bay in 1908 and his observations of dune flora and morphology, published in 1909, provide a valuable record of the pre-Marram landscape. Cockayne described the morphology of the foredunes at Mason Bay in 1908 as:

“a low line of hay-cock-like dunes ... 6-10 ft tall ... These foremost dunes are quite brown with the pingao, so that the sand is barely seen.”

These small shadow and coppice dunes, interspersed with deflation zones, formed in conjunction with pingao and sand tussock. Over the last 40 years or so this landscape has been replaced by a continuous shore-parallel ridge, up to 20 m tall and 200 m wide. Marram grass dominates this massive foredune complex. Pingao is absent from the stoss face of the foredune and it is rare on the leeward slope. This new landform associated with marram grass has trapped a large volume of sand that might otherwise have been transported into and within the hinterland active dune system.

Further to the north, where pingao predominates, the inland movement of sand through the foredunes is less restricted. A reduction in the quantity of sand moving through the foredunes following marram grass invasion may decrease the competitiveness of many specialist dune species. These species will be displaced by wetland and forest species as rates of sedimentation and area of active dune habitat decline. Jul et al. (1998) have described an increase in the number and total area of deflation zones in the dune system since marram grass invasion and foredune complex formation. There has been an increase in wetland habitat characterised by the jointed wire-rush (*Leptocarpus similis*). It is not known what influence marram has had on the wetland development. These habitats are also favoured by many of the introduced pasture

species and indigenous shrub species due to high levels of available moisture. The addition of nitrogen from clover and lupin species is also likely to accelerate dune succession. Thus the impact of marram grass invasion in Mason Bay has been found to extend well inland.

It would also appear that the development of a massive foredune complex associated with the marram grass has affected the development of hinterland dune forms. The deflation zones and trailing arms of hinterland parabolic dune may have eroded at a greater rate following the formation of the foredune complex. We would expect that over time the formation of parabolic dunes, from dune blowouts, may become less frequent as a consequence of marram grass invasion and the development of a stable foredune. The construction of the foredune complex will probably allow the current parabolic dunes to continue to develop and migrate inland with a lower risk of secondary disturbance.

In general, marram grass covered dunes are probably less susceptible to those environmental perturbations that give rise to large scale transgressive dunefield development. The west coast of Stewart Island has experienced repeated episodes of dune system development, followed by stabilisation and re-vegetation. Marram grass has clearly had a significant impact on dune form, dune landscapes and vegetation cover at Mason Bay. But it may have a long-term impact if this species stabilises an otherwise semi-mobile dune system and prevents or inhibits the future development of such active dune systems. This process would result in a serious loss of habitat for a range of plant and animal species associated with active dune habitats.

In conclusion, marram grass is displacing a range of indigenous dune species at Mason Bay, particularly those that occurred across the former pingao-dominated foredunes, and poses a significant threat to the remaining unmodified indigenous dune communities at Mason Bay. Marram grass is also changing the dune form and will inhibit future development of active dune systems. The protection of these dune systems is necessary and a worthwhile investment in the plant ecology of New Zealand. The Department of Conservation along with the Department of Geography, University of Otago, initiated a marram grass control programme at this site last summer.

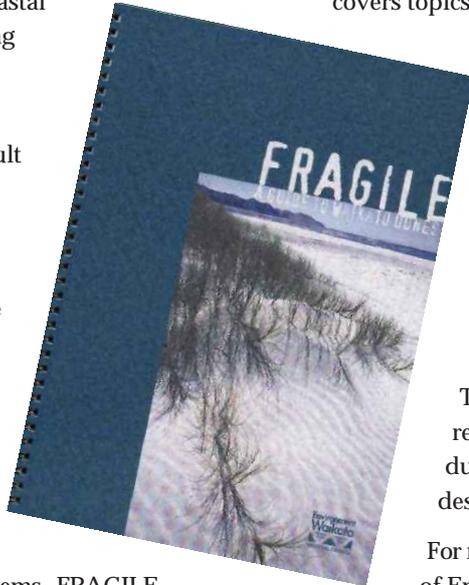
Megan Duncan, University of Otago, email: megandun@es.co.nz

Fragile: A Guide to Waikato dunes

The Waikato Region has a very diverse coastline, and some very significant coastal management issues, including coastal erosion and flooding hazard.

FRAGILE has arisen as a result of inappropriate coastal development and dune degradation.

The booklet provides a simple guide to the dunes of the Waikato Region, and was prepared with the aim of raising the awareness of the importance of coastal dunes, their natural function and values and the human pressures on these systems. FRAGILE is ideal for interested members of the public, Beachcare members and also council staff.



FRAGILE introduces the Waikato coastline and covers topics like the formation of

Coromandel beaches, dune and beach processes and the importance of coastal dunes and natural dune vegetation. It also outlines the major dune management issues (past and present) caused by human use and development in the Waikato Region.

The main elements behind dune restoration and developing a dune management plan are also described.

For more information and/or a copy of Environment Waikato's booklet please contact Bronwen Riddle, phone 0800 800 401 (Bronwen.Riddle@ew.govt.nz).

**Coastal
News**



Work of interest

Economics of beaches

There is ongoing discussion globally as to the fact that recreational beaches are economic assets and should be maintained as any other economic asset, as well as looking at the apparent 'success' of beach nourishment. This is particularly relevant in the USA where recreational beaches are seen more and more as a business that has to be balanced with other concerns. Miami Beach is the classic example, the nourishment of which has led to large increases in tourist visits where Miami Beach now has almost twice as many tourist visits as the top three US National Parks combined (including Yellowstone). An online presentation of this issue can be found at www.asbpa.org

South Korean film on dune management is a success

A South Korean camera team visited Europe to film and research coastal restoration projects in the Netherlands, Belgium and Spain. There was a planned construction of a main road through a pristine natural dune area along the South Korean coast. The film was designed to show the importance of dune systems and the potential negative impact road systems can have. After the broadcasting of the film in Korea the public protested loudly and within two weeks the road

development was cancelled while more research could be undertaken on the impacts of the project.

Dorset and East Devon coast becomes England's first World Heritage Site

UNESCO's World Heritage Committee announced the decision on 13 December 2001. The coastal area, known as the Jurassic Coast, has been awarded the status as a result of its outstanding geology. This coastal area allows us an insight into the world's ancient past, with a complete record through 185 million years of earth history during the Triassic, Jurassic and Cretaceous periods of geological time. If you are interested in more information have a look at the website www.jurassiccoast.com.

Sand lizards halt development project in Holland

The presence of sand lizards found along the Dutch coast have brought a stop to a project to develop a motel and 125 bungalows in the dune area near Ruigenhoek (Noordwijkerhout, the Netherlands). The existence of the threatened sand lizard (*Lacerta agilis*), an animal protected by the European Union Habitats Directive, was enough to halt the development. The Ministry of Agriculture, Nature Management and Fisheries felt that the project would not be in the public interest.

Note from the Chair

Coastal News



Firstly I'd like to record my thanks to Richard Reinen Hamill for his leadership of the Society over the past 2 years. During Richard's time as chair, the Society has consolidated as an organisation, and its major products such as this newsletter and the annual seminar have gone from strength to strength. I know Richard will continue to be a source of leadership and inspiration for the society. It's my pleasure to be your chairperson for 2002, and I'd like to express my thanks to the 2002 committee for their decision, and their courage to be part of a team that will lead some considerable change this year.

With those thoughts in mind, we now have the opportunity to take the Society to a new level, and to make an even more significant contribution to the awareness, understanding and care for our coastal resources. Your new committee has been working hard to develop a series of new initiatives that will deliver a better range of services to you, our customers, as well as ensuring that the NZCS has a role at the forefront of coastal science, engineering, policy and planning. At the centre of these efforts, is a resolve to clarify and compile a clear strategic plan for the society, based on the views of our members as canvassed at last year's seminar. We have developed a draft strategic plan which we hope is both very simple, and projects a clear vision for the future we hope the Society can champion. We would like to know if it meets

your expectations, and describes an organisation that you will continue to support and become fully involved with. The draft plan, and a series of key actions are shown on page 7.

The Committee would like feedback on the draft Strategic Plan by the end of April.

To support the focus on strategy, we have developed a series of key initiatives for the committee to focus on. These include membership (both attracting new members and providing value for existing members), the continued evolution of the newsletter, the management of an up to date and interesting web-page, the development of key relationships throughout New Zealand including the strengthening of regional sub-groups, and the continued tradition of outstanding annual society seminars.

It's our role as your new committee to focus on these initiatives, and to deliver a society with a clear strategic focus, sound membership, excellent lines of internal and external communication and which consistently delivers the best possible product to its members.

We look forward to fulfilling these promises to you over the coming months.

Harvey Brookes
Chairperson, NZCS
hbrookes@arc.govt.nz

NZ Coastal Society — Student Travel Scholarships

The Society is pleased to announce scholarships to assist students or recent graduates of a New Zealand University attend the Society's annual seminar. The value of each scholarship is up to \$500. Successful applicants will also receive free seminar registration. Up to three scholarships will be awarded annually.

Applications close on the 30 June of each year. Applicants must be currently enrolled in a graduate program or have completed their studies within the last 6 months. Successful applicants will be notified by the 31 July and must confirm acceptance of the scholarship by 31 August.

The annual seminar of the Society is usually held in October. In 2002 the seminar will take place on the Coromandel Peninsula.

Applicants must be student or full members of the New Zealand Coastal Society when applications are submitted.

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

- a. the applicants name and contact details (address, phone, email);
- b. the degree completed or enrolled in;
- c. date of completion or intended date of completion of research;
- d. the title of the dissertation or thesis;
- e. a brief (no more than 200 words) account of how the student's research relates to the goals of the Society;
- f. a travel budget (based on advance-booked fares);
- g. their supervisor's signature.

Successful applicants may be required to present a short paper on their research at the annual seminar.

The goals of the Society and applications forms for membership are contained in the website www.cae.canterbury.ac.nz/nzcs/nzcs.htm

Send applications to: Paul Baunton, The Secretary, New Zealand Coastal Society, c/o Tauranga District Council, Private Bag 12022, TAURANGA.

A Strategic Plan for the NZ Coastal Society

Our Mission: *To take a leading role in facilitating a vibrant, healthy and sustainable coastal and ocean environment.*

Our Vision: *To have New Zealand's coastline acclaimed as a world-class example of sound coastal management based on international best practice, involved participatory communities and effective national networks.*

Our Value: *The NZCS will promote this vision by being: visionary and innovative; communicative and effective; non-political and impartial; and leading edge and strategic.*

On behalf of our members, the Committee will act in accordance with these values in all its duties and functions.

**Coastal
News**



NZCS Activities October 2001-October 2002

| | Action | Strategic Outcome | Target | Measure |
|---|--|--|---|---|
| 1 | Create and maintain national relationships from central government to local groups | The NZCS leads and facilitates a co-ordinated web of networks and relationships in the coastal community. | An 10% increase in membership by February 2003 | Membership and newsletter readership growth |
| 2 | Market the value of the NZCS to potential constituents and partners in the coastal community | The membership of the NZCS better reflects the spectrum of coastal interests in New Zealand, and creates a better forum for the exchange of ideas and new concepts | Development of a marketing plan by 15 May 2002. | Membership statistics |
| 3 | Improved membership management and information systems | The NZCS Committee has an up to date membership record which allows for effective communication | 100% of all current members are accounted for on the IPENZ membership database by 15 April 2002 | Membership database |
| 4 | Increased membership diversity | Membership better reflect the diversity of interests in the coast | Gap Analysis of current members versus market opportunities identified in marketing plan by 15 May 2003. | Membership database |
| 5 | National and regional meetings | Effective national communication and development of relationships Effective regional communication and development of relationships Annual report from each area co-ordinator | One national seminar per Year At least 1 regional meeting per region per year 1 report/year | Holding of seminar Annual regional meeting frequency Report frequency |
| 6 | Maintaining and broadening methods of communication | Effective national communication on coastal issues Update and improvement of NZCS web site Maintain and improve the quality of the NZCS newsletter and grow readership | Feasibility study of an e-mailed based coastal discussion group by 1 July 2002 Web site Upgraded by 1 July 2002 Readership of NZCS newsletter and hits to the NZCS website grows 10% by February 2003 | Feasibility assessment reported to NZCS Committee Upgrade programme reported to NZCS Committee Readership/Print Volume/Web site hits. |
| 7 | Greater satisfaction of NZCS Members with services provided | Customer Satisfaction Survey shows an improvement in the quality of services offered by the society | Annual Customer Satisfaction Survey completed along with each annual seminar registration documents | Baseline to be established October 2002 |



Editorial: A foundation for growth

Every strong construction needs a solid foundation. We all know that's the case for seawalls. However, solid foundations can be difficult to find and engineer. The same can be said for trying to build a strong coastal society. A strong and vibrant NZCS will emerge when we have active participation in the Regions. It is here that we must pump up the enthusiasm and activities. In this issue of *Coastal News* you will find an item about Regional Co-ordinators. These will be members of NZCS who will help to organise regional activities – the next *Coastal News* will list who these people will be. Please give them your support and ideas. Coastal News will follow-up by reporting regional activities. It's our role to keep you informed about the changing face of NZCS.

And speaking of change, expect these in *Coastal News*. I will be standing down as Editor after our Coastal Society meeting in October. Lucy Brake will take over as Editor. Please give her your support with news items, articles and any ideas you may have to keep members informed of activities in the coastal arena.

Terry Hume (t.hume@niwa.cri.nz)
Editor, Coastal News

Coastal Dune Vegetation Network Conference 2002 'The Wild West Coast'

The CDVN Conference and AGM was held in Palmerston North from the 13-15th Feb.

The conference theme, 'The Wild West Coast' was chosen to highlight the effect strong winds and major storm events can have on this region of the west coast as well as other west coast sites on the North Island. Management issues and coastal dynamics for places with large areas of dune instability were key topics.

Day 1

Denis Hocking, an academic/renowned local farm forester was surprised and delighted to see such a large number of people interested in coastal dune vegetation. He gave an interesting account of the various land uses, especially in tree growing on sand country both in the past and today. Next, Dr Patrick Hesp (Massey University) gave a great insight into the Manawatu dunefield through environmental changes in geomorphological terms and by human impact.

Technical session 1 was titled Santoft. Pat McCarthy (Ernslaw One Ltd) presented an excellent aerial scan of this coast and outlined the sand forestry work. Patrick Hesp and I talked about methods and results of the CDVN research trial at Santoft, interplanting spinifex with marram grass. A discussion panel was then held (as was the case for all the following technical sessions) on the future of this trial or other trials in this area.

After lunch, an interesting Technical Session 2 began with speakers on other wild west sites in the North Island where there have been attempts,

both successful and not, on revegetating some totally different sorts of exposed sites. Work on the Awhitu Peninsula was discussed, where David Craig told us about their problems with large areas of unstable sand on farming land at the tops of cliffs and some distance inland. Aaron Madden gave a humorous account of his failed planting trial at Waikawa, on the Manawatu coast, but the main point was that he had learnt a lot and was keen to keep trying.

This was followed by a Regional Round-up Session with 7 speakers from managing agencies ranging from Northland down to Dunedin. All gave informative talks on coast care activities and restoration projects they have or envisage having in their region or district.

Day 2

The field trip day started a bit cool and appropriately windy. Paki Paki Bush was the first stop, a now preserved wonderful remnant dune forest some distance inland. Next stops were Waitarere, Foxton and Himatangi beaches to observe coastal processes and management issues. Whilst out on the dunes south of Himatangi, Patrick Hesp talked to us about the dynamics and intrinsic value of parabolic dunes. Dave Dalton (Taupo Native Plant Nursery) gave us a live plant demonstration with some first principles of secondary plantings. After more exploring this dune system, an interesting talk was had with the accompanying 4WD club. This club is very proactive in managing their off-road vehicles in a way that causes minimal damage to the dune ecosystems through educating other members

and carrying out dune planting themselves. A drive north of Himatangi took us to Tangimoana to observe the challenges of coastal exotic forestry and a walk through a nearby DoC reserve, looking at some rare and endangered plant species.

Day 3

Technical Session 4 began with Colin Ogle following up many of the plants we had seen the previous day, ranging from the rare endemic through to exotic pest plants of this coastal region. We heard from Jim Campbell (DoC, Wanganui) on *Acacia sophorae* invasion in this region. Lucy Brake (Environment BOP) gave us a fleeting but most interesting tour of the coastal zone sites she visited in U.S.A, U.K, and Australia. Her studies were funded through a 2001 Winston Churchill Memorial Fellowship. Also from Environment BOP, Greg Corbett, an Animal Pest Officer, gave us informative notes on rabbit control in high public use coastal environments.

Following this session, the CDVN's inaugural annual awards for the Best Coastal Project and the Best Coastal Community Group, sponsored by Naturally Native NZ Plants Ltd and Taupo Native Plant Nursery respectively, were presented. The well deserving recipients were respectively,



Dave Dalton recommending plants for backdune areas, whilst standing in the deflation basin of a parabolic dune

New Plymouth District Council and Te Kaha Coast Care from the Eastern Bay of Plenty.

The day concluded with the AGM, which was a brief but constructive meeting. Following a financial presentation and an update on new CDVN projects, general discussion concluded

that the CDVN is an excellent Network and should remain both as a research and technology transfer forum. To continue growing in both areas, though, a major jump in funding will be required.

In the final item, David Blair (Pikao Recovery Group) presented Dunedin as the 2003 conference venue. All were inspired and this was accepted.

A big thanks to the hosts, horizons.mw, especially Lachie Grant for putting on and resourcing the event. A special thanks to Patrick Hesp for all his time and effort in helping organise the conference and to others from the region - Grant Douglas (AgResearch), Pat McCarthy (Ernslaw One Ltd) and Colin Ogle for their inputs. Thanks too to all our sponsors (including NZCS) who helped make this conference such a great success.

Diana Gainsford, CDVN Coordinator, Forest Research (diana.gainsford@forestresearch.co.nz)

**Coastal
News**



Skip Davis tells the Florida coastal story at a Waikato and Bay of Plenty Branch meeting

Prof Skip Davis, a world-renowned researcher on beaches, tidal inlets and coastal management issues, spoke to a group of about 25 people at a meeting of the Waikato Branch of the NZ Coastal Society on 20 November 2001. Skip spoke about the huge and detrimental impact that dredging of tidal inlet lagoons and the construction of canal waterway subdivisions has had on the stability of tidal entrances and the adjacent coasts in Florida. Given that the Florida coast is low energy, having small tides and an average wave height of <0.3 m, the large scale of the effects are remarkable, and serve as a warning of what could happen on more energetic shores like ours. Skip went on to describe the beach nourishment schemes that are in progress, the costs, successes and issues. It was an excellent and well-illustrated talk, very topical and drew lots of questions.

Skip is the recently retired Programme Director at the Coastal Research Laboratory at the University of South Florida. Under Skip's leadership the coastal geology program has been one of the most active in the USA, with a programme focussing on the barrier/inlet systems of the Florida coasts, the southwest Florida shallow shelf and Puerto Rico. In his retirement Skip will continue to write and keep in hand in things coastal. He hopes to meet again with some of us at Coastal Sediments 2003, which is to be held over 16-19 May in Clearwater, Florida. At the end of the evening Skip was presented with a book illustrating the New Zealand coast. We thank Environment Waikato for hosting the meeting and the supper.

Terry Hume, NIWA

Coastal change and monitoring of natural character in the Auckland Region

Coastal News



There is no mistaking the pressures on Auckland's coastal environment. With an excess of one million people now, this number is expected to double over the next 50 years.

Our beaches are dynamic coastal systems. Historically we have made little allowance for this and much of the original character of the region's coast has been modified by human activity.

Reclamation and erosion protection works such as seawalls have altered physical coastal processes and changed the shape of the shoreline. Dune systems have disappeared beneath roads, buildings and infrastructure. Original indigenous vegetation cover, landforms and landscape have been modified or even destroyed by the development of urban Auckland.

However, despite the impacts of human activities, much of the region's coastal environment has significant natural character and Auckland's beaches and coastal areas are the key contributors to the quality of life in the region.

The preservation of this natural character and its protection from inappropriate subdivision, use and development is a matter of national importance in the Resource Management Act. Continued development is having an adverse effect on these natural values of the coastal environment, but the net effect over time is not quantified, recorded or understood.

Preservation of the natural character of the coastal environment is a Key Performance Indicator for the Coastal Environment Section of the Auckland Regional Council (ARC). The first stage of this process is to establish key components of natural character and consistently apply them. In the absence of any definition of 'natural character' in the RMA it has mainly been left to the Courts to determine. The components identified below have been developed from relevant case law:

- Areas of significant indigenous vegetation.
- Areas of significant habitats of indigenous fauna.
- Ecosystems which are unique to the coastal environment including estuaries, coastal wetlands, dunes, rocky shorelines, subtidal habitats, etc.
- Landscapes, seascapes and landforms

including visually or scientifically significant geological features, wild and scenic areas, variety of landform.

- Dynamic natural and physical processes - ecological processes and wind, wave and tidal processes that shape our coastline.
- Water quality which provides a healthy environment for shellfish, fish, and other marine organisms.

The second stage has focused on aggregating existing data on components of natural character. This has been done in table form and is also being compiled as a series of GIS layers. Both are for use by consent processors when assessing the effects of a coastal permit application on natural character values. A rating system has been developed to assist with this.

A key definition that has emerged from case law on natural character is that it refers to 'a product of nature' as opposed to man-made structures. Development by definition imposes human built structures on a landscape. It also leads to loss of vegetative cover and modification to landforms and ecological and physical processes. This 'coastal squeeze' leads to a greater demand for seawalls and other structures that modify our coast.

Development is the biggest single influence on natural character of the coastal environment, in particular, development that occurs within 100-200m of the coastal marine area. The ARC has undertaken a desktop study of the level of development in the Auckland Region and has classified the region as developed (urban, residential, industrial), partially developed (lifestyle, holiday homes, low density residential) and undeveloped (no buildings).

This study provides a 'broadbrush' view of the current level of development in the Auckland Region for different coastal environments as a proxy of existing 'naturalness' and loss of natural character in the first instance.

Based on this overview, and on information obtained from the Regional Growth Strategy and District Planning documents (e.g. zoning and plan changes), priority areas can be identified and more detailed analysis of natural character at undertaken these sites.



Milford Beach 1910

At a national level, ARC is working with the Ministry for the Environment, Boffa Miskell and other regional councils to develop environmental performance indicators to monitor natural character. The indicators will establish a clear and rigorous methodology to determine (quantify) the existing level of natural character of a coastal environment. The methodology will be repeatable to ensure changes and trends over time can be measured and information can be aggregated to provide a national 'snap-shot' of the state of natural character. These indicators are at a draft stage and will be trialed in the Auckland and Wellington Region between April and June this year.



Milford Beach today. Dunes, estuary and wetland destroyed. Structures encroach across foreshore. Sand swapping between dunes and beach cut-off by rock wall and timber walls (coastal buffer lost).

Auckland's beaches are changing and accelerating growth is putting greater pressure on the remaining elements of natural character. While we may not notice small incremental changes, cumulatively these modifications over time have significantly altered our coastline – often not for the best! Monitoring and quantifying these changes is essential if we are to determine the effectiveness of existing objectives, policies and rules in planning documents and make necessary changes, and also to support restoration of modified areas and provide greater protection to pristine and high natural character areas.

Karen Baverstock, Coastal Resources Officer, Auckland Regional Council (email karen.baverstock@arc.govt.nz).



Coasts and Ports 2003

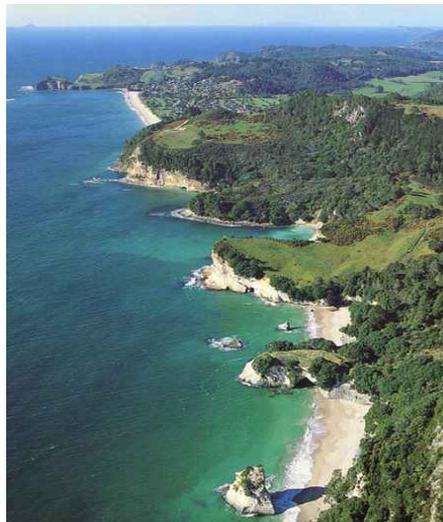
9-12 September 2003, Auckland

The Australasian Conference on Coastal and Ocean Engineering is a forum where a diverse group of practitioners discuss engineering, scientific, planning, and resource management issues of the coastal zone. The conference proceedings contain a wealth of papers covering a diverse range of topics from the construction and design of ports and coastal structures to coastal hazards and ecological monitoring of the marine environment. The conference is held biennially. Every 6th year it is held in New Zealand, and the theme for the Auckland conference is "Coastal development: A quest for excellence". The NZ Coastal Society plays a major role in the running of this conference, which replaces the annual NZCS seminar in 2003. This is a great opportunity to mix with Australian and New Zealand practitioners.

The first announcement will be posted to NZCS members in September 02. Further information will be available from the website which will go live in April 2002.

Test your coastal knowledge

What is the name of the beach in the foreground? Clue: it is near the place where Captain Cook observed the transit of Venus.



(answer on page 15)

Whats hot on the web...

Coastal News



www.dorsetcoast.com

The Dorset Coast Forum was established in 1995 to look at the long-term strategic issues facing the Dorset coast. The overriding aim of the Forum is to promote a sustainable approach to the management, use and development of Dorset's coastal zone, which will ensure that its inherent natural and cultural qualities are maintained and enhanced for the benefit of future generations.

A strategy has now been prepared on behalf of the Dorset Coast Forum. It sets out a future for the coast, covering the coastline and inshore seas from Lyme Regis to Christchurch. As the first part of the strategy 15 topic papers on activities along the Dorset coast were produced. The purpose of these documents was to encourage dialogue and consultation with Forum members and other interested parties, in order to produce a strategy based on consensus. The Forum are now involved in the process of implementing the actions contained within the Strategy



www.doc.govt.nz/Whats-New/Consulting-On/index.asp site

A summary of the review of the Marine Reserves Act 1971 (Tapui Taimoana) is now available on DoC's website. It was written by Boffa-Miskell. Also of interest is the 'Marine and Coastal' conservation section which can be found at <http://www.doc.govt.nz/Conservation/Marine-and-Coastal/index.asp> this looks at issues such as crown ownership of foreshore and seabeds, as well as the Restricted Coastal Plan and Restricted Coastal Activities.



www.oceans.govt.nz/

To update on the progress of the Oceans Policy, which NZCS made a submission on, check out this website. The Ministerial Advisory Committee has undertaken meetings with New Zealanders over the past five months. The findings from this process have been compiled into a report, which is now available to the public downloadable from this website.



www.asbpa.org

The American Shore and Beach Protection Association was founded in 1926 in recognition of the fact that the shores of America's oceans, lakes and rivers constitute important assets for promoting the health and physical well-being of the people of America. This website helps to bring together for cooperation and mutual helpfulness the many agencies, interests and individuals concerned with the protection and proper utilization of these lands. Also of interest on this website is an online presentation of "The Economics of Beaches" (see work of interest).

Update on Aquaculture Reforms

The project to review aquaculture law has reported to government. Policy decisions have been made to amend the RMA and the Fisheries Act. Key aspects of the reform are to:

- Changing the interface between the RMA and fisheries legislation so that regional councils are required to consider all environmental effects, including the impact that marine farming has on the aquatic environment and the use and sustainability of fisheries resources.
- Streamlining the application and environmental assessment process for new marine farms by providing a single-permit approval process to be operated under the RMA.
- Providing regional councils with greater powers to manage and control the development of aquaculture through aquaculture management areas.
- Providing for regional council tendering.
- Retaining the existing legislative requirement that aquaculture development should not have an undue adverse effect on customary, recreational and commercial fishing.
- Repealing the existing marine farm permit system that is operated under the Fisheries Act 1983, and instead requiring MFish to participate in the RMA coastal permit application process.
- Providing in legislation for a trade-off between

aquaculture interests and commercial fishing rights holders in circumstances where aquaculture development would have an undue adverse effect on commercial fishing rights.

- Transferring all existing marine farm lease and licences granted under the Marine Farming Act 1971 into the new regime, by deeming them to be RMA coastal permits and registered fish farms under the Fisheries Act 1996.

The government intends to have legislation ready for introduction in the first half of this year. The Ministry for the Environment, the Ministry of Fisheries and the Department of Conservation are working on the detail of the legislation.

In the interim, to facilitate the move to the new regime and to allow councils to begin identifying areas for aquaculture, the government has introduced legislation providing for a 2 year moratorium. Parliament's Primary Production Committee is considering the Bill, the Resource Management (Aquaculture Moratorium) Amendment Bill. The Committee has heard over 140 submissions and is due to report back to Parliament in March.

For further information contact:

Owen Cox, Ministry for the Environment
(Owen.cox@mfe.govt.nz, 04 917 7445)

Phil Kirk, Ministry of Fisheries
(pkirk@fish.govt.nz, 03 548 187)

**Coastal
News**



Coastal List

Coastal list is a moderated email list for coastal engineers and practitioners. Tony Dalrymple, who many members will have met at the Annual Coastal Seminar in Nelson last year, is the professor of coastal studies at Delaware University is the originator of COAST LIST, a specialist coastal email discussion group. This is an excellent web based source of current international issues in the coastal scene, it provides an opportunity to gain access to coastal scientists, engineers and practitioners from all over the globe for interesting leads and exposure to international coastal work.

The discussions are always informative and of interest to a range of levels within the industry. Subscription and other information about coastal list is found at www.coastal.udel.edu/coastal/coastal_list.html

Committee Member Profile

Matthew Paterson (BSc, MRRP, NZPI) is a Coastal Planner with the Isthmus and Islands team at Auckland City Council. He is currently involved in developing coastal management strategies and preparing guidelines on esplanade reserve requirements, coastal development and hazard management. He is particularly interested in integrated coastal management and the challenges of balancing statutory requirements with community expectation and sustainable management of the coastal environment. Matthew is the Auckland committee representative of the New Zealand Coastal Society.



Coastal Hazards – Tauranga District

Coastal News



An appeal was lodged against the coastal hazard provisions of our Proposed District Plan in 1998.

The extent of the appeal was the full open coast area of Tauranga District. This has subsequently been limited to Papamoa Township Beach only.

The Coastal Hazard Policy Area and plan provisions were notified in 1997 using the 1996 coastal hazard assessment compiled by Dr Gibb which was a culmination of previous work undertaken by himself and other experts for both TDC and EBOP and, among other things took into account the relevant requirements of the Proposed Regional Coastal Environment Plan, the Regional Policy Statement and the NZCPS.

The appellants refute that the Papamoa Beach portion of coastline is subject to, or likely to be subject to any form of significant coastal hazard and therefore disagree that the provisions in our District Plan are either needed or appropriate. Their position is the coastal hazard zone can be confined to seaward of the seaward property boundaries of the existing beachfront properties.

On the other side of the coin Council has over the last 12 years undertaken a series of hazard assessments of our coastline, along with Environment BOP, using several various coastal experts and have identified the risk of coastal hazard based on, what they consider to be, best

and prudent practice without over conservatism.

The hazard assessment compiled by Dr Gibb has identified a zone subject to short term erosion effects, 2 zones which take into account the short term erosion effects but with sea level rise factored in to 2050AD and 2100AD and a final zone called a safety buffer zone to allow for assessment error.

The Hearing to date has been limited solely to scientific issues concerned with hazard assessments, short term extents, long term trends, sea level rise and the use of the Bruun Rule to assess this and its application to our coastline, sediment budgets and mechanisms prevalent on this stretch of coastline and the effect of climate change on all of the above.

To date the Hearing has involved eight days of evidence presentation occurring in August and November 2001. A further three days of hearings took place in March 2002, and the court has retired to make its decision on the extent of and use of hazard zones in the Papamoa Beach Area.

A further installment will follow when that decision is received.

For further information please contact Lucy Brake, Assistant Editor, *Coastal News*, at lbrake@beca.co.nz

Global warming to continue for 100 years

Global warming will continue for the next 100 years even if fossil fuel consumption is dramatically reduced, a US climate expert warned today. Carbon dioxide or CO₂ emissions from burning fossil fuels already present in the atmosphere will likely increase the temperature of the globe by between 1.3°C and 5.6 °C this century, with sea levels increasing six inches to nearly one metre, a leading US climate expert said.

The changes are likely to result in "fairly large changes within the next generation," Professor Robert Dickinson of the Georgia Institute of Technology told the American Association for the Advancement of Science (AAAS) which is holding its annual meeting here this week.

"We're talking about people with houses on the beach having to move," he said in a statement. "The US is fairly resilient, and people can move. But in Bangladesh and other low-elevation areas with few resources, there will be severe

difficulties," said Dickinson, who is with the Institute's School of Earth and Atmospheric Sciences.

The climate changes indicated by the modelling undertaken by Robinson and his colleagues will also cause some dislocation in agricultural production, with some regions becoming more productive because of increased rainfall, while others see their productivity decline because of changing weather patterns. On balance there will be more rainfall, which - paired with increased evaporation - will lead to more floods and more droughts, Dickinson said.

When natural variations in temperature over time are thrown into the equation, the data suggests an increase in frequency of the El Nino weather pattern in the tropics, which could lead to more droughts in Australia and Indonesia and greater rainfall on the western coast of the United States.

Source: Boston, Massachusetts, Feb 17 AFP

Conferences/Workshops

7th International Conference on Remote Sensing for Marine and Coastal Environments
20-22 May, 2002, Miami, Florida, USA

This international conference focuses on the application of remote sensing and advanced geospatial information technologies to address real-world problems and improve decision-making in marine, inland water, and coastal environments. The conference also explores implementation strategies by bringing scientists and technologists together with decision-makers and end-users to examine how they can work in concert to increase the responsiveness of these technologies to specific information needs.

11th Biennial Conference on Physics of Estuaries and Coastal Seas
17-20 September 2002, Hamburg, Germany

You are invited to pre-register with or without submitting an abstract for this Conference supported by the Institute for Science Networking in Oldenburg, Germany.

For Conference details and registration please go to the website: www.pecs-conference.org

Littoral 2002 "The Changing Coast" Conference
22-26 September 2002, Porto, Portugal

This is a joint EUCC and EUROCOAST Conference, the theme for which is 'The Changing Coast' with sub-themes covering Heritage, Biodiversity, Land Use Conflicts, Medium and Long Term Predictions, Sustainability Indicators, Integrated Coastal Zone Management.

For more information go to website:
www.eucc.nl/littoral2002/

30th PIANC-AIPCN Congress
22-26 September 2002, Sydney, Australia

PIANC is a worldwide organisation composed of

individuals, corporations and national government bodies. Its primary focus is promoting worldwide development in the design, construction, improvement, maintenance and operation of inland and maritime waterways, ports, harbours and coastal zones. The PIANC Congresses are held every four years to provide a forum for the debate of technical papers and to facilitate contact at an international level.

For further information go to the website:
www.tourhosts.com.au/pianc/

Coast to Coast 2002: Source to Sea. Australian National Coastal Management Conference
4-8 November 2002, Tweed Heads, NSW

This is the latest in the series of Australian coastal conferences. The Preliminary Announcement and on-line Expression of Interest Form is available on www.coastal.crc.org.au/coast2coast2002/

Further details from Sally Brown, email:
sally.brown@uq.net.au

Coastal Sediments '03
18-23 May, 2003, Clearwater Beach, Florida, USA

Coastal Sediments '03 is a multi-disciplinary international conference convened for researchers and practitioners to discuss science and engineering issues of coastal sediment processes. The conference will provide a high level technical forum for exchange of information among the fields of coastal engineering, geology, oceanography, meteorology, Physical Oceanography, and biology.

Abstracts for this Conference are due by 1st September 1, 2002

For more information go to the website:
www.coastalsediments.org or contact Abby Sallenger, email: asallenger@usgs.gov

**Coastal
News**



New Zealand Coastal Society Seminar 2002

The NZCS 2002 Seminar and AGM will be hosted by Environment Waikato in October, with Field Trips to the Coromandel beaches with a focus on key development issues associated with this coastal environment.



More information will be posted on our website as it becomes available. Look out for the next Coastal News mid year for a confirmation of dates, venue and theme for this Conference. Details will also be made available on the Society's website.



Test your coastal knowledge (page 11): Cathedral Cove, Eastern Coromandel



NZCS Management Committee

| | |
|-------------|---|
| Chairperson | Harvey Brookes – Auckland Regional Council (hbrookes@arc.govt.nz) |
| Secretary | Paul Baunton – Tauranga District Council (paulb@tauranga.govt.nz) |
| Treasurer | Eric Verstappen – Tasman District Council (Eric@tdc.govt.nz) |

Committee

| | |
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| Lucy Brake | Beca Carter (lbrake@beca.co.nz) (Assistant Editor <i>Coastal News</i>) |
| John Lumsden | Coastal Management Consultant, Christchurch (j.lumsden@cae.canterbury.ac.nz) |
| Ken Murray | Department of Conservation (KMurray@doc.govt.nz) |
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| Matthew Patterson | Auckland City Council (PatersoM@akcity.govt.nz) |
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Correspondence to Paul Baunton (paulb@tauranga.govt.nz)

Website queries to Charles Hendtlass (c.hendtlass@cae.canterbury.ac.nz)

NZCS Mission Statement

“The New Zealand Coastal Society was inaugurated in 1992 to promote and advance sustainable management of the coastal environment. The Society provides a forum for those with a genuine interest in the coastal zone to communicate amongst themselves and with the public. The Society currently incorporates about 300 members. Members represent the wide range of coastal science, engineering and planning disciplines, and are employed in the engineering industry, local, regional and central government, research centres and universities.”

Applications for membership should be sent to the Secretary (see above)



Coastal and Marine research & consultancy

We offer:

- numerical modelling of water and sediment dynamics
wave, currents
- tide data collection and analysis
- bathymetry, side-scan sonar, sub-bottom seismic surveys
- sediment sampling and analysis
- beach profile monitoring, Cam-Era technology
- water quality measurements, ecotoxicology
- benthic ecology surveys

Examples:

NIWA's state-of-the-art equipment, numerical models, and analysis skills have been applied to:

- sand resource surveys
- coastal erosion and hazard assessment
- pipeline and cable surveys
- waste discharge outfall design and monitoring
- port deepening and ship motion studies
- tidal predictions and forecasting
- Ocean wave climate predictions
- Assessment of environmental effects
- design and implementation of monitoring programmes
- studies of climate change effects

For more information, contact:
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Visit our web site at:
www.niwa.co.nz

