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Speech to the Marine Sciences Society Conference

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“Management and use of marine resources”

Introduction

Good morning everyone.

I am delighted to have the opportunity to speak to you today – particularly in what is such a special location here on Stewart Island.

I think it is fitting that this year’s Conference takes place in such a setting, where the richness of our unique marine resources is well known, valued and cherished. Like all New Zealanders, Stewart Islanders live on a small island set amongst a vast ocean. Surrounded by so much sea, it is hardly surprising that marine resources have always been of great importance to those who live here. Ever since the 13th century, when Rakiura was settled by Maori, the island’s marine resources have provided its inhabitants with a rich source of sustenance, culture, recreation and livelihood. Over the centuries the island has sustained eras of sealing, whaling, ship-building, fishing, and tourism. Many of those trades continue today. Fishing, aquaculture, tourism and conservation are now the main industries supporting the 400 people that call this stunning landscape home. Almost all of these pursuits are based on marine resources.

That is why I am certain that the topic of my speech to you today is one that would be as close to the hearts of Stewart Islanders as it is to my own, and I’m equally sure, to yours. That is - Managing and using our marine resources in ways that are sustainable but at the same time enhance New Zealand’s economic prosperity.

I want to talk to you about several topics today.

Firstly – I would like to talk a bit about our marine environment and its importance to New Zealand and the international community. I know this is familiar ground for most of you but I don't think it hurts to remind ourselves every once in a while what's at stake.

I'd then like to touch on some of NIWA's capabilities in marine sciences, and on the importance, particularly in a small nation such as ours, of collaboration with other organisations – many of whom I'm really pleased to see represented here today.

Finally, and most importantly, I'd like to touch on what I think we need to manage and make best use of our marine resources, given the challenges we face.

To start, let me introduce myself and my interest in marine science and research. I am speaking to you today primarily in my role as the chairman of NIWA, the National Institute of Water & Atmospheric Research – which, as most of you know, is the CRI responsible for conducting leading environmental science to enhance the benefits of New Zealand's natural resources. I was appointed to the NIWA chairmanship in July 2009 and I have enjoyed the challenge.

I am not a scientist and my first real involvement with science and research came in the early 1990s when I was asked to become involved in the restructure of the science sector, led by Minister Simon Upton. This involved the disestablishment of the DSIR, the restructuring of various science and research divisions of government departments and the establishment of the Crown Research Institutes. This stimulating assignment began for me an ongoing commitment to the science and research sector and a better understanding of the valuable contribution that science and innovation can make to New Zealand's environmental and economic prosperity.

Following the restructure, I went on to chair one of the new CRIs, the Institute of Environmental Science and Research, ESR, and I was then asked to undertake the establishment of Antarctica New Zealand in 1996. Following the untimely death of Sir Peter Blake it was my great honour to be asked by the government to chair a steering committee to establish a trust in memory of Sir Peter, focused on leadership and the environment.

I have also been privileged to work alongside most of the universities involved in marine science research in New Zealand. In particular, my involvement in the redevelopment of the University of Auckland's Leigh Marine Research Campus at Goat Island. The new campus opened officially last week, now provides a state-of-the-art facility to support world-renowned undergraduate and postgraduate study in marine sciences. My association with the Leigh project has also led to me chairing a group for the advancement of scholarships in marine science, directed by the Universities of Otago, Victoria and Auckland. We need to give more recognition to the role young scientists' play in driving the future development of marine sciences in New Zealand, and I'll talk a bit more about this shortly.

That is why it is my great privilege to have the opportunity to speak with you today, and share my passion for understanding, managing and conserving our marine environment.

1. Our marine environment

Our marine environment is both one of the largest and most unique in the world. We have the fourth largest Exclusive Economic Zone in the world - more than 400 million hectares of diverse marine environment, 15 times the size of our land mass. New Zealand's right over a further 1.7 million square kilometres of seabed on the continental shelf was confirmed by the United Nations in 2008, following extensive survey work by NIWA, along with GNS Science, for Land Information New Zealand. We have right of sovereignty over the Ross Dependency, an area 14 times our land mass, and our marine responsibilities – such as search and rescue and monitoring of illegal fishing activities in marine protected areas – stretch even further afield. In all, New Zealand is responsible for a large proportion of the world's marine environment – nearly 8 percent of the world's surface!

Because our marine environment provides a unique and accessible laboratory for research, there is huge international interest in undertaking marine science here. Our marine environment is globally important both in terms of its biodiversity – up to 10 percent of total global species have been estimated by NIWA to live in our waters – and because of the unique role our oceans play in understanding how climate change might impact globally. Our marine environment is also nationally

important, of course, because of its immense economic, social and environmental value. Our oceans and coasts are rich with resources, and they make a significant contribution to our economy through fishing and aquaculture, oil and gas exploration and extraction, tourism and recreation, transport and telecommunications links. Many of these resources are already being well utilized, but management is often, I'd say, fragmented. As you know, the marine sector is supported by a wide range of government agencies, including the Ministry of Fisheries, shortly to be part of a new ministry, Department of Conservation, the Ministry for the Environment, the Ministry of Transport, Maritime New Zealand, Land Information New Zealand, and regional councils. But there is no single agency responsible for coordinating the management of our whole marine environment. There is huge untapped potential in our oceans and coastal waters, and the government has clearly indicated their intention to increase the use of these resources. Under the current global economic environment, I think that is prudent. But with such a large area to manage, and increasing demand for resources, without an integrated strategy our ability to sustainably manage those resources will clearly be compromised. We need evidence-based policy that coordinates the way we use the resources to enhance our economic prosperity, while at the same time ensuring the environmental impacts are minimised. Science will play a critical role in guiding and informing that policy development.

2. NIWA's role and capabilities

As the lead research agency tasked with enhancing the economic value and sustainable management of New Zealand aquatic resources and environments, marine science and research is one of the main pillars of NIWA's work. Our revenue in the last financial year was \$120 million. Nearly half of this comes from our coastal and ocean work. Marine science is a big part of what we do.

Our staff are our greatest asset. NIWA employs about 700 science and support staff across 16 sites in Australia and New Zealand, and more than 230 of them have doctorates in their area of expertise. Our team also supervises over 70 PhD and Masters students, as part of our commitment to enhancing science learning at a tertiary level.

NIWA's science services are delivered through 13 specialist National Centres. Nearly all of these centres touch on marine sciences in some way, but of specific note are our National Centres of Aquaculture, Aquatic Biodiversity and Biosecurity, Coasts, Fisheries, and Oceans. About two-thirds of the NIWA team work for these Centres and spend all or some of their time working in marine science related projects. So our involvement in marine sciences includes oceanography, marine biodiversity and biosecurity, ecology, environmental monitoring, coastal processes, fisheries, climate and ocean interactions, Antarctica, the Ross Sea, aquaculture development, marine hazards, ocean geology and geophysics. There is no way I could cover all of work we are doing, but it's vast and varied – and it has a significant impact on the economic and environmental prosperity of New Zealand.

We are helping build New Zealand's \$1 billion aquaculture industry through our R&D of farmed finfish. We provide scientific advice to the Ministry of Fisheries on the sustainable harvest of more than 100 fish species. We're mapping large areas of the seabed in order to understand more about ecological processes in the sea, and underwater natural hazards like landslides and fault lines. We are investigating potential mineral deposits on the ocean floor. We hold some of the most nationally and internationally significant marine collections, including the marine invertebrates collection. We offer expert services in environmental impact assessment in estuaries and coastal areas, coastal erosion and hazards and coastal habitat assessments. We're working on a better understanding of Antarctic and Southern Ocean climate, oceans, and ecosystems – how they will change in the future and their longer-term impact on New Zealand and the rest of the world. And we fulfil our international obligations providing advice to international agencies tasked with managing Antarctic marine resources and environments like CCAMLR, the Convention for the Conservation of Antarctic Living Marine Resources.

I am delighted that some of our NIWA team are able to be here for this conference and I hope you will take the opportunity to hear more about the exciting and challenging work they are doing.

It is not just our talented people that make NIWA a leader in marine research. We have just completed a substantial three year programme of capital investment, demonstrating our commitment to ensuring our people and New Zealand has the right infrastructure, tools, and facilities they need to conduct

world-class science. We have assets worth more than \$125 million, and much of that investment is focused on enhancing marine science. Recent key capital investments included the \$20 million we spent on refitting our largest research vessel Tangaroa, to ensure it will meet New Zealand's ocean science needs over the next 20 years. Tangaroa is New Zealand's only deepwater, ice-strengthened research vessel, and, following the refit, New Zealand's only vessel fitted with a DP2 dynamic positioning system. Our vessel capabilities and the experience of our vessels team mean we are now uniquely placed to undertake research from the tropics to the high seas of the Southern Ocean and Antarctica. Tangaroa works in a wide variety of marine environments including the Kermadecs, the Chatham Rise and Macquarie Ridge, and has now made nine trips to Antarctica, including the first Australia-New Zealand Antarctic Whale Expedition as part of the Southern Ocean Research Partnership last year. NIWA research vessels also criss-cross the Pacific and the Indian Ocean, making a major contribution to the Argo international ocean observation programme.

We have also invested substantially in enhancing our aquaculture capabilities, making NIWA the largest aquaculture research facility in New Zealand. We believe that the future of aquaculture development in New Zealand lies in high value finfish, not in low value seafood commodities, and our research has focused on commercialising hapuku and kingfish. We were the first in the world to close the life cycle of hapuku in captivity, and although there are a couple of years of intensive R&D ahead, initial taste tests have proved a hit. Other key investments include upgrading our national environmental monitoring network and the installation of a new \$12 million IBM p575 Power 6 supercomputer at our Greta Point site. It is the most powerful research computer of its type in the Southern Hemisphere and a major strategic asset for NIWA and the country, greatly enhancing our ability to forecast the environment with much greater accuracy and timing and on a much smaller scale. So, we use it for climate forecasting, including the impacts of severe weather events, but we also use it to model impacts like rising ocean levels and wave patterns, to help the country plan better for the future. Like Tangaroa, it is a New Zealand asset, but all this investment helps ensure NIWA is best-placed to fulfil our role as a leader in marine science.

3. Collaboration in marine science

I often think people regard marine science as a specific discipline, but as you all know it is not. Marine science collectively draws on many science disciplines, mostly particularly biology, geography, geology, chemistry, physics, statistics, mathematics, computer modelling and social science. There is also a clear interface with technology, engineering, business, law, public policy and economics. We do not have all these disciplines and specialities in one organisation, and we are a small country. So, it is essential that organisations involved in marine sciences work closely with each other, and with those managing and using our marine resources, to build our knowledge and understanding of our marine environment and its various interactions. The Marine Sciences Society plays a key role in ensuring this happens through its activities, press releases, commentary, publications, awards, and most importantly, by bringing the marine science community together for conferences like this, where you can share and discuss the wide range of work you are all doing. NIWA is proud to be a long-term sponsor of the conference, and we congratulate the Society for its ongoing commitment to fulfilling this important role in the marine sciences community.

At NIWA, collaboration with other organisations, be it with universities, other CRIs and research entities, industry, iwi, government departments, regional councils, and international agencies, is fundamental to our work. We are currently involved in more than 800 collaborative projects with other research organisations. Two hundred and thirty of these are formal research collaborations with international organisations, but most of them involve collaboration at a national level.

NIWA is proud to share strong working relationships with the other CRIs involved in marine research. We work closely with the Cawthron Institute, particularly in the area of marine biodiversity and biosecurity, and also with GNS Science on marine geology work. These collaborations add value, not only to improving our scientific knowledge, but also to New Zealand as a nation – both environmentally and economically. For example, the University of Otago and NIWA recently joined forces to conduct a seismic survey on our research vessel Kaharoa, in an area of southern Pegasus Bay, near Lyttleton. The survey was part of Project Offshore, a Natural Hazards Research Platform response to the Christchurch

earthquake. The survey information, combined with data held by GNS Science and other partners, has helped us understand the broader fault zone along which the Christchurch faults have ruptured, in preparation for rebuilding the city. This is a real example of how collaborative research can create national benefits. Similarly, an ongoing international programme between GNS, NIWA and the Woods Hole Oceanographic Institution to explore the mineral potential of volcanoes in the Kermadec Arc could have significant economic benefits for New Zealand in the long-term. At the same time, other NIWA team members are also looking at the possible biological impacts of mining that resource, and whether particularly sensitive and unique animals will be affected, giving government and policy-makers the full spectrum of information and evidence to make future decisions on.

Because of my particular interest in science and education, I am personally very proud, and encouraged, by the strong relationships NIWA has with the universities offering marine science undergraduate and postgraduate studies in New Zealand. As I have already noted, New Zealand's marine environment is large and rich with resources and, as such, it has immense economic, social and environmental value to our country. It is heartening to see our present government recognise this fact. But I firmly believe a heightened focus on marine resources will require an increase in high quality graduates in marine sciences to meet industry needs and ensure sound research and governance of our marine environment continues in the future. That means we need to continue to build and integrate our national tertiary level teaching and research capabilities in marine sciences, and fund them effectively. To meet this challenge, a University of Auckland, Victoria University and Otago University partnership has recently been established to develop a national platform for advanced teaching and research in marine science. I think this is a great example of how collaborative effort will enhance marine science in New Zealand, by breaking down institutional barriers and ensuring there are appropriately qualified and sufficient numbers of marine science graduates to meet the demands of all sectors including industry in the future.

NIWA supports two Centres of Excellence focused on attracting the best students and training them at postgraduate level in marine sciences – the Aquaculture and Marine Ecology Centre of Excellence with

the University of Canterbury and the Chemical and Physical Oceanography Centre of Excellence with the University of Otago. The main goals of the Centres are to promote and enhance research excellence, attract the best students nationally and internationally in each core area, attract funding to support training and research and, of course, improve our collaboration on research initiatives. Many of the students are situated in our NIWA offices and benefit hugely from the opportunity to interact closely with our team and use NIWA's specialist facilities.

As part of NIWA's ongoing commitment to enhancing marine science studies and research in New Zealand, and recognising our role as a leader in coastal and marine science, it is my very great pleasure to also announce to you today that a Memorandum of Understanding was signed between NIWA and the University of Auckland on the 30th of May, establishing a Joint Graduate School in Coastal and Marine Science. Both NIWA and the University recognise that the capabilities, infrastructure, activities and facilities of the two organisations are complementary. Combining our resources will create the very best environment to increase the number and quality of world-class graduates in marine sciences, and deliver greater benefits to the management and use of New Zealand's marine resources. The Joint Graduate School is the third formal relationship we have set up in marine sciences with the universities - complementing our existing commitments with Otago and Canterbury.

4. Managing our marine resources – what we need

As I briefly touched on earlier, managing our marine environment is not an easy task because of its size and diversity. The ocean is a large, interconnected ecosystem, yet we have no explicit over-arching strategy for how we manage it. Instead, agencies manage the various activities under different laws, management regimes, and decision-making processes, which are not always well integrated. To me, that is both imprudent and dangerous, particularly given the government's increasing emphasis on exploiting our marine resources. I've no doubt the need to get greater value from our marine resources has never been more important for New Zealand's long-term prosperity. We face unprecedented economic difficulties, so it makes sense to make use of what we have. But increasing the use of our resources means we face increasing difficulty in how we manage them. We have already seen examples

of how conflicting interests between building our economic prosperity and protecting our unique marine environment might play out in the future - in the tidal energy project at Kaipara, for example, or the oil exploration off the east coast. These conflicts highlight, more than ever, the need for a strong, well-defined, and integrated National Oceans Strategy to inform policy development and guide how our marine environment is researched, managed, and used. Back in 2000, the government began work on developing an Oceans Policy for New Zealand, but this work ground to a halt in 2003 to take account of government decisions on public access and customary rights to the foreshore and seabed. Very little has happened since. Instead, says MfE, "oceans work has focused on fixing the most pressing marine problems in the short term while taking a more coordinated and integrated approach to marine management over time." "EEZ legislation", it says, "is a top priority for the current government." I take a more cynical view. I don't think it's a top priority, but I certainly think it should be.

So, we urgently need a National Oceans Strategy. One wouldn't run a business without a comprehensive strategy outlining key needs, goals and policies. And nor should we manage and use such a valuable asset as our marine environment without one. We need a strategy that balances competing needs, focuses our science on understanding the interlinked processes of our oceans ecosystems, and sets a clear direction for how we use and manage our precious and extensive marine resources. Without a national strategy we will continue to respond reactively, without clear vision. The cumulative environmental effects could be catastrophic and could eventually constrain any further economic growth from our marine resources.

I believe there are four other areas we could make progress in too.

Firstly, we need greater funding for marine sciences. As the Prime Minister's Chief Science Advisor Sir Peter Gluckman noted recently in his excellent discussion paper on policy formation, science creates the platform for effective strategies and wise policy development. I wholeheartedly agree. Science's role is to provide the foundations to build a strong, integrated Oceans Strategy, and then effectively monitor and evaluate its success. Marine sciences are significantly underfunded in comparison to the terrestrial sectors – and this urgently needs to change.

Secondly, we need even greater collaboration in marine sciences – between CRIs, universities, government agencies and industry. I think we’re working well together, and recent initiatives like the establishment of the Joint Graduate School in Coastal and Marine Science and the 10-year contract NIWA has recently signed with the Ministry of Fisheries for deepwater research will help, but there is always room for improvement. Shared knowledge and expertise is power. Greater collaboration will ensure we bring our collective skills to the table to better manage and use our marine resources in a sustainable and economically advantageous way.

Thirdly, as I’ve already touched on we are going to need appropriately qualified and sufficient numbers of marine science graduates to meet the growing demands of the various sectors involved in using and managing our marine resources. This will also require more investment and better collaboration.

Finally, good science in itself is not enough. We need to get smarter at communicating the science we are doing. Science’s role, I believe, is to be a respected and independent voice in the fierce debates that will continue over how our marine resources are managed. Science should be objective and unbiased, and steer away from being adversarial, but that does not mean we shouldn’t engage in dialogue. You need to tell everyone what you know, and what you are still learning, about our marine environment. Communicating what we know leads to greater public understanding, informed debate, potential options and solutions, and a foundation from which sound policy and decisions can be made.

Concluding remarks

I want to thank you for the opportunity to speak to you today. As I mentioned before it is a privilege to share my passion for understanding, managing and conserving our marine environment with an audience of like-minded people. I wish you well for the rest of the conference.

It is my firm belief that until we have a strong, well-defined and integrated National Oceans Strategy to inform policy development and guide how our marine environment is researched, managed and used, our ability to enhance the economic value and sustainable management of our marine resources will be compromised. But this is not an excuse to stop doing what we are already doing very well. My message

to you, as scientists, as researchers, as students of marine science, is: continue doing the great work you do, share with one another, learn from each other, collaborate more on your research projects, and think about how you communicate that work in a smarter and more sophisticated way to policy makers, industry, to all New Zealanders. All this will help us manage and use our marine resources in a more prudent manner in the future.

Finally, I want to leave you with some words from my good friend Sir Peter Blake. I think they apply to all of us involved in science and education:

“Whatever the area, fulfilling one’s potential requires worthwhile goals, a ruthlessness in setting standards and the courage to avoid the soft options that constantly present themselves.”

Thank you.