

International research & services

NIWA overseas

NIWA continues to extend its reach in the global science community with the ongoing development of its subsidiary companies in the USA – NIWA (USA), Incorporated and NIWA Environmental Research Institute (NIWA ERI) – and its subsidiary company NIWA Australia based in Brisbane. NIWA also carries out substantial research for a variety of clients elsewhere, and some examples of this research are given below.

NIWA Australia has tailored its services to provide for natural resource managers and users, and environmental science organisations and businesses. Its senior staff are based in Queensland and have experience working in both government agencies and the private sector. NIWA (USA) concentrates on commercial consultancy services, and NIWA ERI is a not-for-profit organisation specialising in multidisciplinary public good research involving management systems, environmental risk assessment, design issues, policy development, and social impacts.

All three companies focus on core skills held by NIWA in New Zealand, including skills in atmospheric physics and chemistry, oceanography, aquaculture, environmental modelling, aquatic chemistry, hydrology, and freshwater ecology.

NIWA Australia

Research has focused on southeast Queensland through contracts for key state and local government agencies, including the Queensland EPA, Department of Natural Resources and Mines, Brisbane Water, and the Brisbane City Council. Collaborative research links are being developed with a number of universities, including The University of Queensland, Griffith University, James Cook University, Southern Cross University, and The University of Melbourne.



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A NIWA Australia and University of Queensland project looking at the impacts of sand dredging on nutrient enrichment in Moreton Bay, Queensland.

NIWA in the USA

Projects undertaken in the USA during 2002–03 included the development of a dataset of global satellite and radiosonde observations, modelling sediment movement in large rivers, measuring stratospheric ozone concentrations, and assessing the toxicity of contaminated sites. NIWA has a longer-term contract with the University of Massachusetts to calibrate and maintain two microwave sensors designed to measure the vertical distribution of ozone in the stratosphere, and environmental engineer Ian Boyd has been based in Amherst, Massachusetts, since August 2000. The microwave instruments are at Mauna Loa Observatory in Hawaii and NIWA's atmospheric laboratory at Lauder in Central Otago. The ozone measurements from these instruments form part of an international network assessing ozone depletion and searching for signs of ozone recovery as nations implement the Montreal Protocol.



Mike Kotcamp calibrating the ozone microwave radiometer at Lauder.

NIWA at sea

Protecting the Ross Sea toothfish fishery. NIWA has been carrying out research on toothfish biology and the exploratory longline toothfish fishery in the Ross Sea for several years, initially as a PGSF project, but more recently under contract to the Ministry of Fisheries. We have provided advice and carried out analyses on a wide range of topics, such as catch sampling methods, genetics, age and growth, abundance, and bycatch and seabird mitigation. Each year, NIWA scientists travel to the fish stock assessment meetings of CCAMLR (Commission for the Conservation of Antarctic Marine Living Resources) held in Hobart to estimate sustainable yields for the main Antarctic finfish stocks of toothfish and icefish.

Fishery resource assessment in the UAE. The fishery resources of the very warm and very salty waters of the southern part of the Arabian/Persian Gulf were surveyed by a New Zealand-based consortium with a major science input from NIWA. The year-long survey of demersal and pelagic resources was commissioned by the Environmental Research and Wildlife Development Agency in Abu Dhabi, United Arab Emirates.

Random trawl surveys and acoustic surveys covered an area of 37 000 km² along a 700 km coastline. NIWA staff provided survey design, sampling and data collection systems, ageing of fish, data entry, and trawl survey and acoustic analysis. A series of training sessions and seminars contributed to the capability of local fisheries research and management staff, and NIWA staff were stationed in the UAE for up to 2 months to provide technical support and training.



Neil Bagley training UAE staff.

Yellowtail snapper. The assessment of the yellowtail snapper fishery was reviewed for the US National Marine Fisheries Service. This provided a valuable opportunity to broaden NIWA's understanding of international practice in fisheries assessment techniques.

Pelagic fisheries. NIWA scientists with expertise in pelagic fisheries for tunas continue to provide scientific and technical support to New Zealand delegations to major international fisheries management conventions. These include the Commission for the Conservation of Southern Bluefin Tuna, and the Western and Central Pacific Fisheries Convention.

NIWA in the desert

As part of an assessment of the effects of discharges from numerous petrochemical industries in Saudi Arabia, NIWA carried out an atmospheric tracer study at a large oil refinery. This involved field work and sample analysis in a specially set-up gas chromatograph with advanced equipment shipped from New Zealand. The result was very successful and NIWA has received a 5-year environmental monitoring contract, involving atmospheric, freshwater, and marine assessments.



The Rabigh Oil Refinery

NIWA in South-East Asia and the Pacific

NIWA is engaged in a wide variety of research with countries from South-East Asia and the Pacific.

Training overseas hydrologists. NIWA has for many years provided hydrological training throughout the Southwest Pacific and South-East Asia, for water supply, hydropower, and catchment management schemes. More recently, NIWA staff provided work experience training for water resources staff from Papua New Guinea, Solomon Islands, and Vanuatu, and conducted projects designed to develop water resources assessment capabilities in Malaysia, Indonesia, Vietnam, Lao PDR, Cook Islands, and Samoa.

In Cambodia a system was developed for the Mekong River Commission in Phnom Penh to convert all the hydrological data into Tideda format for CD-ROM, replacing the old printed yearbooks. Commission staff were trained to use the system so they could update the CD-ROMs as new data were received.



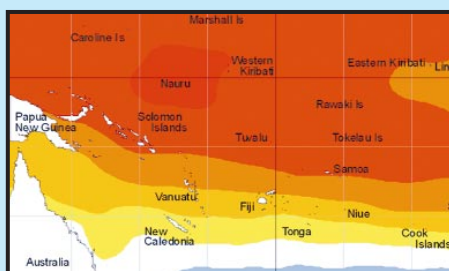
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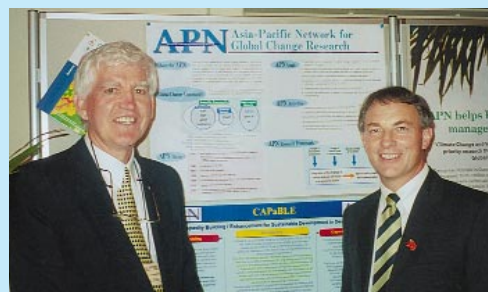
Bob Curry

Keeping an eye on the Pacific's climate. *The Island Climate Update* is a monthly newsletter prepared by NIWA's National Climate Centre in collaboration with weather and climate agencies from Australia and the Pacific Islands. It provides an overview of the climate in the tropical South Pacific, is distributed throughout the Pacific, and is made possible with support from the New Zealand Agency for International Development (NZAID) and South Pacific Regional Environment Programme (SPREP). It is also available free on the web.

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Helping Pacific Island states manage climate change. NIWA Business Development Manager (Pacific) and Asia-Pacific Network (APN) Scientific Planning Group Co-chair Dr Andrew Matthews was one of the key speakers at the third Japan and Pacific Islands Forum (PIF) summit meeting in Okinawa, Japan. He introduced the APN to leaders and members, including Japanese Prime Minister Junichiro Koizumi, and highlighted how APN helps Pacific Island states manage climate change. He also announced the launch of the 'Scientific Capacity Building/Enhancement for sustainable development in developing countries (CAPaBLE) programme.

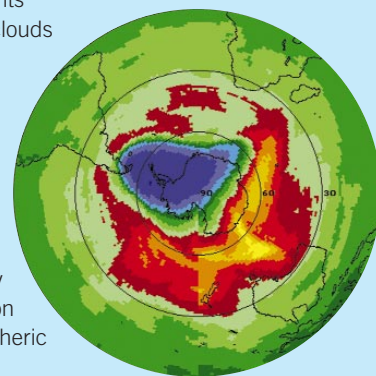


Dr Andrew Matthews and New Zealand's Minister of Foreign Affairs and Trade Phil Goff at the leaders' meeting.

Key sites internationally for atmospheric research

What is driving climate change? NIWA's atmospheric research laboratory at Lauder in Central Otago is there because it is a clean air site, far from industrial pollution, and it has many cloudless days – a prerequisite for a lot of the remote sensing measurements made at Lauder. Staff at Lauder measure ozone, the trace gases and aerosols affecting its concentration, UV radiation, and the clouds that affect UV radiation.

Lauder is one of five sites around the world in the international network designed to observe and understand the physical and chemical state of the stratosphere. The measurements are used by researchers at Lauder and elsewhere in New Zealand and by the international community working on understanding what is driving stratospheric change and climate change.



As a result of the strict limitations imposed on the production of CFCs, the Antarctic ozone hole is expected to recover, but this recovery may be delayed by up to 15–20 years because of greenhouse gas increases.

Measuring greenhouse gases. NIWA makes high precision measurements of the three main greenhouse gases (carbon dioxide, methane, and nitrous oxide) at its Baring Head atmospheric research station, at Scott Base in Antarctica, and from ships and aircraft in the Pacific and Southern Oceans. Baring Head has been used since 1972 to detect large increases in atmospheric greenhouse concentrations in the New Zealand region. It provides the international community with the longest continuous record of atmospheric carbon dioxide measured in the southern hemisphere as well as unique isotopic measurements of methane. This information is widely used by the scientific community and policy makers.



The Baring Head station and lighthouse.