Environmental Monitoring Networks

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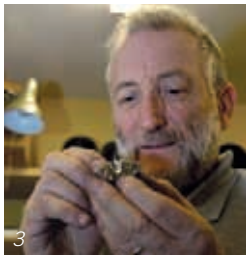
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1. *Demonstration deployment of an Argo ocean-profiling float from RV* Kaharoa.
2. *Temporary meteorological station.*
3. *Rain gauge calibration.*
4. *Filling balloon to take ozone-measuring instruments to the stratosphere.*
5. *Routine check on water-level station.*
6. *River gauging with an Acoustic Doppler Current Profiler.*
7. *Solar power sustains our networks.*

support

Alan Blacklock, Steve Le Gal, NIWA

From the upper atmosphere to the ocean depths

Lasers probe the night sky outside the tiny Central Otago township of Lauder, whilst a current meter hangs in the pitch black above the ocean's abyssal plain.

Every minute of every day, NIWA's unique environmental monitoring networks collect long-term data vital to developing a deep, nuanced, scientifically rigorous understanding of our changing planet. Long-term time series take decades to become headline news but they reward investment and perseverance.

The National Climate Database, for example, contains over 250 million individual measurements, with records dating back to the 1850s.

In July 2007, NIWA moved to allow free online access to archived data on climate, lake levels, river flow, sea levels, water quality, and freshwater fish. In the first year of free data access, the number of users of the Climate Database jumped from 130 to over 4000. The amount of data being downloaded increased more than four-fold.

Users represent just about every sector in New Zealand's economy – primary industry, education, environmental, energy, and business generally – as well as recreational interests as diverse as racing pigeons and hot air ballooning.

For example, the free service is adding another dimension to Schoolgen, a programme created by Genesis Energy and supported by the Ministry for the Environment's Sustainable Management Fund. Students can compare generation statistics from solar systems at participating schools, funded by Genesis Energy, with corresponding NIWA solar radiation data and maximum daily temperatures, streamed to the Schoolgen website.

NIWA's monitoring data provide scientific objectivity in heated controversies. Our National Water Quality Network, for instance, has been operating at 77 sites since the 1970s. It can now show long-term trends in water quality, typically indicating reduced pollution from urban 'point sources' such as factories, but more nutrient-rich run-off from intensive agriculture.

Many of our networks provide records of international significance. NIWA Lauder is the only fully-instrumented Southern Hemisphere mid-latitude site in the global Network for the Detection of Stratospheric Change, providing vital information on ozone depletion and climate change.

And in typical 'Kiwi' style, we contribute well above our size to the development of other global monitoring networks. Our 28-metre RV *Kaharoa* has deployed a world-record number of ocean-profiling 'Argo' floats, for instance. NIWA's contribution enabled the Argo network to reach its target global coverage of 3000 floats this year, and we continue to deploy replacement floats.

From the upper atmosphere to the ocean depths, NIWA's environmental monitoring networks enable good natural resource planning and decision-making, based on quality-assured, scientific data, while providing a myriad of new learning and research opportunities with the potential to advance knowledge. Small wonder we regard them as a national treasure.

James Sturman, Michael Bargh, Graham Bryers, Elaine Fouhy, Kathy Walter, NIWA

As at 1 August 2008, NIWA had 1339 operational stations in its climate and water monitoring networks, spread throughout New Zealand including the Chatham Islands. NIWA also holds data from more than 3000 closed stations (not shown on the map), many of which have long usable records.