

NIWA USA & NIWA Australia

www.niwa-eri.org

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NIWA has established three businesses outside New Zealand to provide research and consulting services similar to those offered by NIWA Science. Two operate in the USA – **NIWA Environmental Research Institute** (a not-for-profit entity that focuses on US-funded research) and **NIWA (USA), Inc.** (which provides environmental consulting services for a range of clients) – and one in Australia – **NIWA Australia Pty Ltd**, which has staff in Brisbane who create a front door for marketing NIWA Science capabilities in Australia.

Where on earth is Nooksack?

The Nooksack River catchment covers an area of about 3600 sq km in the far north of the US state of Washington.

A group of stakeholders in Washington state, including citizens, local government, tribes, and state and federal agencies are developing plans for allocating water, protecting water quality, and restoring fish habitat in this catchment.

NIWA-ERI, under contract to Utah State University, developed a detailed hydrology model of the Nooksack catchment. The project used an extension of NIWA's Topnet system to simulate rainfall-runoff processes, irrigation and artificial drainage, reservoir storage, water abstraction (including minimum flow restrictions), and 'return flows' from water users. The results from the Topnet model feed into Utah State University's water quality model and stream habitat model. These three models are linked within a decision support system being used by the stakeholders to allocate water resources and plan land use.

Human health risk assessed

Many water management agencies in Australia assess water-related *ecological* 'health' risks across an entire region. Very few, however, attempt to assess *human* health risks at such scales.

NIWA Australia has conducted a human health risk assessment for all of South East Queensland, covering contact recreation, drinking water, and the harvesting of aquatic organisms (prawns, shellfish, etc.).

The project was commissioned by the Secretariat of the Moreton Bay Waterways and Catchments Partnership, on behalf of its stakeholders (local government, industry, research bodies, and community groups in South East Queensland). NIWA Australia involved ESR and a Brisbane engineering firm, WBM, as subcontractors.

After reviewing international best practice, we adopted a 'comparative risk assessment' approach, where experts assign scores to hazardous events, taking into account their likelihood, scale, severity, and duration of human health effects. Amongst other things, we developed a series of models such as that illustrated here. They show links between water use and hazardous events in various locations, and are being used to communicate risk to the public and non-medical specialists.

Smart software helps track air pollution for NASA

NASA's Goddard Space Flight Center contracted NIWA ERI to develop a software package to read and prepare data on trace gases collected from an international network of ground-based instruments. These measurements will be used to help validate information from NASA's Aura satellite.

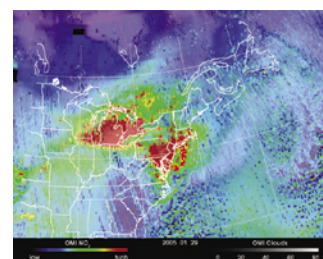


Image generated by the NASA Goddard Space Flight Center OMI NO₂ team.

This image from Aura's ozone monitoring instrument shows the total amount of nitrogen dioxide in the atmosphere over the USA on 29 January 2005. Nitrogen dioxide is a precursor in the formation of tropospheric ozone. The red areas on the map show high amounts of nitrogen dioxide; the purple areas show regions of cloud where no readings could be taken. Air quality alerts were issued for Michigan during this period.

The troposphere is the lowest layer of air, approximately the first 10 km from the ground, and ozone here is a pollutant. By contrast, ozone in the next layer up, the stratosphere, helps protect us from harmful solar ultraviolet radiation.



Conceptual model illustrating hazardous events identified as potential risks to people undertaking recreational activities in South East Queensland.

great services