



One of the objectives of LERNZ is to share knowledge with other lake researchers from all over the world and to provide a series of lectures for the general public and end user groups. In this newsletter we introduce you to some of our current international visitors. We also outline one of our major programmes of research relating to restoration of biodiversity in Karori Sanctuary Reservoir.

Karori Sanctuary Perch Removal

Karori Wildlife Sanctuary in Wellington is one of the world's first predator-proof "mainland islands". The mission of the Karori Wildlife Sanctuary is to restore the valley to its pre-human state, with a 500 year vision. Since the construction of a predator-proof fence in 1999, 13 mammalian species of pests have been eradicated, many trees have been planted and 11 species of native birds have been released, many of these either endangered or threatened.

A key element of the restoration strategy for the Sanctuary is to restore the freshwater ecosystem and to control the recurring algal blooms. For this reason, a group of researchers from the University of Waikato spent most of a week in the Sanctuary in order to remove introduced pest fish. Red-finned European perch have been living in the Sanctuary's lower lake for nearly 130 years. They are so numerous that the young perch eat most of the zooplankton that would normally control the algae, and they are now so dominant that native fish such as giant kokopu and bullies have disappeared.

In a New Zealand first, the researchers compared day and night fish capture rates by boat electrofishing. Their extremely successful sampling trip removed nearly 4,000 perch by a combination of boat electrofishing and netting. A single boat electrofishing pass removed 40-66% of the perch present in the littoral zone, suggesting that a considerable effort would be required to fish the perch out. Night-time capture rates of perch were 2-4 times greater than day-time rates, which implies that fisheries scientists will be doing some late-night work in the future!



A pair of brown teal (Anas chlorotis), classified as endangered species on the IUCN Red List 2006, in a scum of blue-green algae in Karori Sanctuary.



From top left: Anne Pouwels, David Hamilton, Ben Hodges, Dudley Bell, Matthew Prentice, Nick Ling; In front: Brendan Hicks, Dale Robertson, Emma Joss

For more information about the project please contact:
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Christoph Brakel and Marcel Brokbartold

Christoph and Marcel are German students from Lippe and Höxter University of Applied Sciences, who will be doing an internship at the Centre for Biodiversity and Ecology Research for the next five months. Their stay is funded through the "Go Global" scholarship of their home university. The scholarship is awarded to students to support their social competence and to qualify them to work on international projects in the future by improving their language skills. Under the supervision of David Hamilton, Christoph and Marcel will work on different lake restoration projects. These will include the analysis of water quality trends in relation to climate trends, a coherence analysis for the Rotorua lakes, and the continuation of a monitoring programme on Lake Ngaroto.



Marcel Brokbartold (left) and Christoph Brakel

Visit by Dale M. Robertson (5-22 February)

Research Hydrologist, U.S. Geological Survey (USGS),
Water Science Center, Middleton, Wisconsin, USA

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Dr. Dale M. Robertson is a Research Hydrologist with the U.S. Geological Survey, Water Science Center, in Middleton, Wisconsin, USA. He received his M.S. and Ph.D. in Oceanography and Limnology at the University of Wisconsin-Madison, which dealt with effects of climate change on the physical dynamics of lakes. He was a Post-Doctoral Research Fellow at the University of Western Australia, where he worked on modeling the physical dynamics of lakes and reservoirs. His current research deals with modeling eutrophication in lakes, developing nutrient criteria for streams, examining the effects of climate change on lakes, and estimating nutrient loads in streams. During his visit to the University of Waikato, Dale has been working with David Hamilton, Dennis Trolle and Chris McBride to incorporate the chemistry and biology into an ecological model (DYRESM-CAEDYM) for Delavan Lake, Wisconsin. The goal of this work is to determine the relative importance of internal nutrient loading to the productivity of the lake. This information will then be used to guide lake rehabilitation efforts and for comparative analyses with Lake Rotorua.

Visit by Ben Hodges (31 January – 22 February)

Associate Professor in the Department of Civil,
Architectural and Environmental Engineering at the
University of Texas, Austin, USA

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During the late 1990s Ben Hodges was a post-doc at the Centre for Water Research, University of Western Australia with Prof. Jorg Imberger. He did his Ph.D. in Civil Engineering at Stanford University under Prof. Robert L. Street. His principal research is in environmental fluid mechanics, with a focus on mixing and turbulence in stratified waters. In particular, he is interested in the physics of temperature stratification in lakes and salinity stratification in estuaries, which can have consequences for the environmental health of the ecosystems. His work is both in modeling (he wrote the ELCOM hydrodynamic lake model that some post-graduate students at Waikato are using), and in field studies. During his visit here, Ben deployed a Self-Contained Autonomous Microprofiler (SCAMP) during Biofish sampling of Rotorua lakes and during the perch removal in Karori Reservoir. The SCAMP measures the fine scale (~1mm) temperature structure of the water from which the turbulent mixing characteristics



can be calculated. *Ben with the SCAMP at Karori*

Photo: Ben Hodges - Electrofishing in Karori Sanctuary

Visit by Norman Yan

Professor of Biology, York University, Toronto, Canada

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Norman Yan visited Hamilton in the first week of February and presented a seminar about the 'Recovery of Canadian lakes from the damage caused by acid rain'. Acid rain was one of the issues that started the environmental movement in North America. Norman presented 30 years of history of acid rain research for Ontario, Canada, demonstrating that while there has been substantial ecological recovery, it is not complete, and has recently been compromised by calcium and phosphorus decline and by global warming.

After this informative talk, Norman used the chance to invite interested students and scientists to Canada to do research in his department at York University.

Anne Pouwels

Anne Pouwels has been awarded a Science, Mathematics and Technology Teachers' Fellowship (Royal Society Teaching Fellow) and will be based in the Centre for Biodiversity and Ecology Research at Waikato University throughout 2007. Anne is the Deputy Principal of St Andrews Middle School and will be working with David Hamilton adapting information available through GLEON and other current lake research programmes into school curricula, with emphasis on how statistical enquiries and scientific investigations are linked, the possibilities of career pathways for school students in lake ecology and promoting to students and the general public the sustainability of our lakes.

Visit by Bernie Boudreau (26-27 February)

Professor in the Department of Oceanography,
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Bernie is in New Zealand as a keynote speaker at the 6th International Symposium on Ecohydraulics in Christchurch. While in the country he will take the opportunity to visit the Centre for Biodiversity and Ecology Research and NIWA in Hamilton. Bernie's research is directed at a theoretical understanding of transport and reaction of chemicals, both solids and solutes, in sediments and across the overlying boundary layer of water. The changes engendered by these processes in sediments are called early diagenesis. This approach to geochemical and oceanographic problems has been rather successful in addressing a number of environmental problems. During his visit, Bernard will present a seminar in the Department of Biological Sciences on Sediment Diagenetic Processes. (12pm Tuesday 27 Feb.)

For more information:

www.lernz.co.nz

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