

LERNZ

Lake Ecosystem Restoration New Zealand



University of Waikato

Issue 17, Oct - Dec 2010

Kevin Collier has Kudos

Kevin Collier works with LERNZ and Environment Waikato on research related to large river and stream management and restoration. He has been presented with the WEL Networks Environmental Science Award at the Kudos Awards ceremony. He has worked in this field for 25 years and has made a sizeable contribution to the literature on effects of land-use on stream health, threatened fish and invertebrate species and water quality indicators. This includes being senior editor of the recently published book 'The Waters of the Waikato: ecology of New Zealand's longest river'.

Koi carp trap trial at Lake Waikare

In Adam Daniel's PhD study, co-funded by Department of Conservation, Environment Waikato and the Pest Fish Outcome Based Initiative, it was found through tracking radio-tagged fish that many koi carp move between Waikato River and the riverine lakes. After a workshop with Australian researchers, it was decided by regional pest fish managers to test a specialised push trap at the Lake Waikare fish pass, identified by Adam as a primary migration route for carp. Electro-fishing was used by University of Waikato, Environment Waikato and Ngaa Muka Development Trust staff to capture and remove approximately 1.6 tonne of trapped koi carp (777 fish) over two and a half days with very little native fish by-catch. It is hoped that a permanent trap will be installed at the pass in the future.



Ray Tana removing koi carp from Lake Waikare fish pass (Photo, Adam Daniel)

The LERNZ group is now on Facebook if you would like to join. Type LERNZ into the search box.

NZ Freshwater medal - David Hamilton



Congratulations to David Hamilton who was awarded the New Zealand Freshwater Sciences Society Medal of Excellence at the 2010 conference, for his outstanding contributions to freshwater science. David has been a member of NZFSS since 1985 and is current president. He is the NZ representative for the International Society of Limnology and has several other international collaborations including with scientific journal editorial boards.

Lake Rotorua modelling for the future

Lake Rotorua has been subject to increased nutrient loads over recent decades and has been experiencing frequent algal blooms for some years. To assess restoration options, LERNZ has joined forces with NIWA and coupled the catchment model ROTAN (Rotorua Taupo Nitrogen Model) with the lake ecosystem model DYRESM-CAEDYM to simulate the effects of different restoration methods on the water quality in Lake Rotorua. Several different potential land-use change scenarios, in-lake restoration measures and engineering options (e.g., in-stream nutrient locking) will be investigated. During this study, both LERNZ and NIWA are working closely together with one of our end-users, Bay of Plenty Regional Council, to develop an effective restoration package for Lake Rotorua.

New leader of IO2



Adam Daniel has recently taken up a Research Officer position within the OBI project where he leads Intermediate Outcome 2 (IO2); Pest Fish Management for Lake Biodiversity Restoration. Adam has relocated from his native, United States of America with his family, to return to University of Waikato where he completed his PhD in 2009, which followed a degree in Natural Resource Science from Washington State University in 1997. Adam has extensive knowledge of pest fish, both through his past work in New Zealand and most recently, in the US where he worked with the US Army Corps of Engineers in Washington State with a focus on carp and other pest fish in the Columbia River. Adam has already launched himself into a number of fishing and hunting adventures.

For more information go to www.lernz.co.nz Centre for Biodiversity and Ecology Research, Department of Biological Sciences, Science and Engineering, The University of Waikato, Private Bag 3105, Hamilton 3240, New Zealand.

Conferences

New Zealand Freshwater Sciences Society conference was held in Christchurch this year and many of our students and staff attended and presented posters and oral presentations which are listed on <http://www.lernz.co.nz/>. University of Waikato students won five of the awards. Pictured below are some of our winners; **James Blyth** (SIL Trust Best Oral Presentation), **Courtney Kellock** (Golder NZ Best Applied Poster), **Bex Eivers** (DoC Best Conservation Poster) and **Jennifer Blair** (Fish and Game Best Oral Presentation). **Nina von Westernhagen** (SIL Trust Best Poster) is not pictured. (Photo, Melany Ginders).



Kohji Muraoka and **Chris McBride** attended the second GLEON meeting this year was held in Nanjing, China. They were funded through GLEON, with Chris also obtaining funding through Liancong Luo from Jinan University.

Congratulations Konrad and Nina

Congratulations to **Nina von Westernhagen** and **Konrad Gorski** on successfully defending their PhD theses. Konrad returned to the Netherlands for his defence. He investigated flood pulse dynamics and its impact on fish recruitment in large rivers (Volga, Russian Federation). Nina returned to complete her thesis after having two children. She examined water quality processes in Lake Rotoiti, specifically the impact of Ohau Channel inflow and Okawa Bay on nutrient dynamics in the lake.

Visitors and new people

Ilia Ostrovsky is a visiting scientist from Kinneret Limnological Institute in Israel. He specialises in hydroacoustics and sedimentation, hydrodynamics. He will be here for six months.

Kevin Rose is a visiting PhD student from Miami University (Ohio, USA). Kevin is working with Chris McBride and David Hamilton to develop methods to improve estimates of buoy based chlorophyll sensors used on New Zealand lakes.

Maxim Wauthy is a MSc graduate from Catholique de Lourain University, Lourain-La-Neuve, Belgium. He is working with David Hamilton and Chris McBride collating LERNZ data into a database.

Tine Ulrich is an MSc student from Humboldt University, Berlin, Germany. She is doing research work under Nick Ling, investigating haemoglobin-oxygen binding in bullies and some galaxiid species and environmental effects on haemoglobin-oxygen binding.

Teis Boderskov is a BSc (Hons) student from Aarhus University, Denmark. Teis is working with David Hamilton and Brian Sorrell to measure the distribution of raupo *Typha orientalis* in an oligotrophic and a eutrophic lake then use that information in the shear-stress model to explain the distribution found.

Josh de Villiers has finished his BSc at University of Waikato and hopes to start his MSc next year. For now, he is working as a summer student on ways to increase the trapping rates of gambusia by adding glow sticks or a female fish, as attractants, to minnow traps.

Nicola McNoort is working as a summer student on modelling scenarios to reduce the decline in trophic status in Lake Rerewhakaaitu.

Black mudfish and lake restoration

Radio NZ has broadcast a story about black mudfish (*Neochannus diversus*) and the Lake Kaituna restoration on Our Changing World. **Nick Ling** and **Amy MacDonald** talk about their mudfish research including translocation of mudfish into Lake Kaituna. Farmer Andrew Hayes talks about the restoration of Lake Kaituna, and **Rebecca Eivers** outlines her sediment trap work. Download the story from

www.radionz.co.nz/ourchangingworld



Black mudfish (*Neochannus diversus*) (Photo, Nick Ling)

Recent Publications

- Allibone, R., David, B., Hitchmough, R., Jellyman, D., Ling, N., Ravenscroft, P. and J. Waters. 2010. Conservation status of New Zealand freshwater fish, 2009. New Zealand Journal of Marine and Freshwater Research DOI: 10.1080/00288330.2010.514346.
- Duggan, I.C. 2010. The freshwater aquarium trade as a vector for incidental invertebrate fauna. Biological Invasions 12: 3757-3770
- Duggan, I.C. and M.A. White, 2010. Consequences of human-mediated marine intrusions on the zooplankton community of a temperate coastal lagoon. New Zealand Journal of Marine and Freshwater Research 44: 17-28.
- Gibbs, M.M., Hickey, C.W. and D. Özkundakci, 2010. Sustainability assessment and comparison of efficacy of four P-inactivation agents for managing internal phosphorus loads in lakes: sediment incubations. Hydrobiologia, DOI 10.1007/s10750-010-0477-3.
- Hamilton, D.P. and M. Landman. 2010. Lake restoration: An experimental ecosystem approach for eutrophication control. Hydrobiologia 661:1-3. DOI 10.1007/s10750-010-0560-9.
- Landman, M.J. and N. Ling. 2010. Fish health changes in Lake Okaro, New Zealand: effects of nutrient remediation, season or eutrophication? Hydrobiologia DOI:10.1007/s10750-010-0315-7.
- Ling, N. 2010. Socioeconomic drivers of freshwater fish declines in a changing climate: a New Zealand perspective. Journal of Fish Biology 77, 1983-1992.
- Trolle, D., Hamilton, D.P., Pilditch, C.A., Duggan, I.C. and E. Jeppesen. (in press). Predicting the effects of climate change on trophic status of three morphologically varying lakes: Implications for lake restoration and management. Environmental Modelling & Software Verburg P., Hamill, K., Unwin, M. and J. Abell. 2010. Lake water quality in New Zealand 2010. Status and trends. NIWA Client Report: HAM2010-107. National Institute of Water & Atmospheric Research Ltd, Hamilton.
- von Westernhagen, N. 2010. Measurements and modelling of eutrophic processes in Lake Rotoiti. PhD thesis, Department of Biological Sciences, University of Waikato.
- Wolf, W.M., Trolle, D., Jeppesen, E., Arhonditsis, G., Belolipetsky, P.V., Chitamwebwa, D.B.R., Degermendzhy, A.G., DeAngelis, D.L., De Senerpont, Domis L.N., Downing, A.S., Elliott, J.A., Frago, Jr C.R., Gaedke, U., Genova, S.N., Gulati, R.D., Håkanson, L., Hamilton, D.P., Hipsey, M.R., 't Hoen, J., Hülsmann, S., Los, F.J., Makler-Pick, V., Petzoldt, T., Prokopkin, I.G., Rinke, K., Schep, S.A., Tominaga, K., Van Dam, A.A., Van Nes, E.H., Wells, S.A. and J.H. Janse. 2010. Challenges and opportunities for integrating lake ecosystem modelling approaches. Aquatic Ecology 44(3): 633-667.