

1. PERSONAL DETAILS

Nationality: Canadian (NZ Resident since 1998); applying for NZ citizenship

Websites:

University of Otago staff webpage:

<http://www.otago.ac.nz/Zoology/staff/otago008970.html>

University of Otago Ecology Research Group webpage:

http://www.erg.otago.ac.nz/index.php?option=com_content&view=article&id=182:lakes-and-their-catchments-research-programme-lcrp&catid=119:dept-of-zoology&Itemid=170

Video of research project on “lake snow” in Lake Wanaka:

<http://www.youtube.com/watch?v=94xs81d6w9Q>

<http://vimeo.com/15243706>

2. ACADEMIC QUALIFICATIONS

- | | |
|------|--|
| 1993 | PhD (McGill University, Montreal)
"The ecology of sediment bacteria and hypolimnetic catabolism in lakes : the relative importance of autochthonous and allochthonous organic matter" |
| 1987 | BSc (McGill University, Montreal)
Ecology, Evolution and Behaviour |

3. DISTINCTIONS AND AWARDS

- | | |
|-----------|---|
| 2008 | Invited keynote speaker to the Lakes Water Quality Symposium in Rotorua |
| 2006 | Invited to be an expert peer reviewer for the 4th IPCC Report, Chapter 11 |
| 2003 | New Zealand Limnological Society SIL 1987 Trust Fund Award for Travel |
| 1994-1996 | Canadian Natural Sciences and Engineering Research Council
Postdoctoral Fellowship |
| 1989-1992 | Canadian Natural Sciences and Engineering Research Council
Postgraduate Fellowship |
| 1988 | McGill University Frank Rigler Memorial Fellowship in Aquatic Sciences |

4. ACADEMIC EMPLOYMENT

- | | |
|--------------|--|
| 2003-present | University of Otago - Research Fellow |
| 1994-2002 | University of Otago - FRST-funded Postdoctoral Fellow |
| 1993 | National Institute of Water and Atmospheric Science (Christchurch) Postdoctoral Fellow |

5. PUBLICATIONS

Published peer-reviewed papers (2001 - present):

Lill, A.W.T., Closs, G.P., Schallenberg, M & Savage, C. (2012). Impact of Berm Breaching on Hyperbenthic Macroinvertebrate Communities in Intermittently Closed Estuaries. *Estuaries and Coasts* **35**: 155-168.

Burns, C.W., Brett, M.T., Schallenberg, M. (2011). A comparison of the trophic transfer of fatty acids in freshwater plankton by cladocerans and calanoid copepods. *Freshwater Biology* **56**: 889-903.

Lill, A.W.T., Closs, G.P. & Schallenberg, M. (2011). Late summer hyperbenthic estuarine communities: Comparing permanently open and intermittently closed systems along the Otago coastline. *New Zealand Journal of Marine and Freshwater Research* **45**: 73-83.

Lill, A.W.T., Closs, G.P., Savage, C. & Schallenberg, M. (2011). Annual secondary production of two estuarine mysid species (Mysidacea: Mysidae) inhabiting an intermittently closed estuary, south-eastern New Zealand. *Marine and Freshwater Research* **62**: 823-834.

Schallenberg M., Larned, S.T., Hayward, S. & Arbuckle, C. (2010). Contrasting effects of managed opening regimes on water quality in two intermittently closed and open coastal lakes. *Estuarine, Coastal and Shelf Science* **86**: 587-597.

Drake, D.C., Kelly, D. & Schallenberg, M. (2010). Shallow coastal lakes in New Zealand: current conditions, catchment-scale human disturbance, and determination of ecological integrity. *Hydrobiologia* **658**: 87-101.

Schallenberg M. & Sorrell B. (2009). Factors related to clear water vs turbid water regime shifts in New Zealand lakes and implications for management and restoration. Submitted to: *New Zealand Journal of Marine and Freshwater Research* **43**: 701-712.

Bayer T., Schallenberg M. & Martin C.E. (2008). An investigation of nutrient limitation status and nutrient pathways to Lake Hayes, Otago, as a case study for integrated lake assessment. *New Zealand Journal of Marine and Freshwater Research* **42**: 285-295.

Downs T.M., Schallenberg M. & Burns C.W. (2008). Responses of lake phytoplankton to micronutrient enrichment: a study in two New Zealand lakes and an analysis of published data. *Aquatic Sciences* **70**: 347-360.

Thomas D.B., Schallenberg M. (2008). Benthic shear stress gradient defines three mutually exclusive modes of non-biological internal nutrient loading in shallow lakes. *Hydrobiologia* **610**: 1-11.

Schallenberg M., Bremer P.J., Henkel S., Launhardt A. & Burns C.W. (2005). Survival of *Campylobacter jejuni* in water: grazing by the freshwater crustacean *Daphnia carinata* (Cladocera). *Applied and Environmental Microbiology* **71**: 5085-5088.

Schallenberg M. & Armstrong, A. (2004) Assessment of antibiotic activity in surface water of the lower Taieri Plain and impacts on aquatic bacteria in Lake Waipori, South Otago, New Zealand. *New Zealand Journal of Marine and Freshwater Research* **38**: 19-28.

Schallenberg M. & Burns C.W. (2004) Effects of sediment resuspension on phytoplankton production: teasing apart the influences of light, nutrients, and algal entrainment. *Freshwater Biology* **49**: 143-159.

Schallenberg M., Hall C.J. & Burns C.W. (2003) Consequences of climate-induced salinity increases on zooplankton abundance and diversity in coastal lakes. *Marine Ecology Progress Series* **251**: 181-189.

Schallenberg M., Burns C.W. & Peake B.M. (2003) A temperate, tidal lake-wetland complex 1. Water balance and ecological implications. *New Zealand Journal of Marine and Freshwater Research* **37**: 415-428.

Schallenberg M. & Burns C.W. (2003) A temperate, tidal lake-wetland complex 2. Water quality and implications for zooplankton community structure. *New Zealand Journal of Marine and Freshwater Research* **37**: 429-447.

Prebble M., Schallenberg M., Carter J. & Shulmeister J. (2002) An analysis of phytolith assemblages for the quantitative reconstruction of late Quaternary environments of the Lower Taieri Plain, Otago, South Island, New Zealand I. Modern assemblages and transfer function. *Journal of Palaeolimnology* **27**: 393-413.

Burns C.W. & Schallenberg M. (2001) Short-term impacts of nutrients, *Daphnia*, and copepods on microbial food-webs of an oligotrophic and eutrophic lake. *New Zealand Journal of Marine and Freshwater Research* **35**: 695-710.

Burns C.W. & Schallenberg M. (2001) Calanoid copepods versus cladocerans: Consumer effects on protozoa in lakes of different trophic status. *Limnology and Oceanography* **46**: 1558-1565.

James M. R., Schallenberg M., Gall M. & Smith R. (2001) Seasonal changes in plankton and nutrient dynamics and carbon flow in the pelagic zone of a large, glacial lake: effects of suspended solids and mixing. *New Zealand Journal of Marine and Freshwater Research* **35**: 239-253.

Schallenberg M., Friedrich U. & Burns C.W. (2001) Postulated responses of phytoplankton and bacteria to predicted increases of inorganic suspended sediments in oligotrophic lakes. *New Zealand Journal of Marine and Freshwater Research* **35**: 763-779.

Schallenberg M. & Burns C.W. (2001) Tests of autotrophic picoplankton as early indicators of nutrient enrichment in an ultra-oligotrophic lake. *Freshwater Biology* **46**: 27-37.

Selected peer-reviewed papers published prior to 2001:

Schallenberg M. & Burns C.W. (1997) Phytoplankton biomass and productivity in two oligotrophic lakes of short hydraulic residence time. *New Zealand Journal of Marine and Freshwater Research* **31**: 119-134.

Burns C.W., Schallenberg M. (1996) Relative impacts of copepods, cladocerans and nutrients on the microbial food web of a mesotrophic lake. *Journal of Plankton Research* **18**: 683-714.

Bell G., Lechowicz M.J., Appenzeller A., Chandler M., DeBlois E., Jackson L., MacKenzie B., Preziosi R., Schallenberg M., Tinker N. (1993) The spatial structure of the physical environment. *Oecologia* **96**: 114-121.

Schallenberg M. & Kalff J. (1993) The ecology of sediment bacteria in lakes and comparisons with other aquatic ecosystems. *Ecology* **74**: 919-934.

Rasmussen J.B., Godbout L. & Schallenberg M. (1989) The humic content of lake water and its relationship to watershed and lake morphometry. *Limnology and Oceanography* **34**: 1336-1343.

Schallenberg M., Kalff J. & Rasmussen J.B. (1989) Solutions to problems in enumerating sediment bacteria by direct counts. *Applied and Environmental Microbiology* **55**: 1214-1219.

Published book chapters:

Schallenberg M. & Cadmus R.W. (2010). Chapter 4: Site interpretation 1. Pp. 38 – 47 *In*: Peters M. & Clarkson B. (eds). *Wetland Restoration: A Handbook for New Zealand Freshwater Systems*. Manaaki Whenua Press.

Schallenberg M. & Cadmus R.W. (2010). Chapter 5: Site interpretation 2. Pp. 48 – 59 *In*: Peters M. & Clarkson B. (eds). *Wetland Restoration: A Handbook for New Zealand Freshwater Systems*. Manaaki Whenua Press.

Schallenberg, M. (2004). Primary production in the open water. *In*: Harding, J. S.; Mosely, M. P.; Pearson, C. P.; Sorrell, B. K. (eds). *Freshwaters of New Zealand*, Chapter 22, New Zealand Hydrological Society, Christchurch. 16 p.

Rowe, D. & Schallenberg, M. (2004). Food webs in lakes. *In*: Harding, J. S.; Mosely, M. P.; Pearson, C. P.; Sorrell, B. K. (eds). *Freshwaters of New Zealand*, Chapter 23, New Zealand Hydrological Society, Christchurch. 16 p.

Published Book Reviews:

Schallenberg, M. (2010). Review of, “Assessing the conservation value of fresh waters” by P.J. Boon & C.M. Pringle. *Oryx* **44**: 305.

Schallenberg, M. (2005). Turn of the century limnological progress report. (Review of, “The Lakes Handbook Volume 1: Limnology and limnetic ecology” by P.E. O’Sullivan and C.S. Reynolds). *New Zealand Journal of Ecology* **29**: 157.

Commissioned limnology reports:

Schallenberg M. (2011). Ecological Values and Condition of the Kaihoka Lakes and Lake Otuhie, Northwest Nelson. Tasman District Council. 33 pp.

Bodger F., Shorrocks K., Schallenberg M. (2011). Wanaka water supply algae issues. Queenstown Lakes District Council report prepared by MWH. 67 pp.

Schallenberg M., Death R., Clapcott J., McNeil C., Young R., Sorrell B., Scarsbrook M. & Kelly, D. (2010). Approaches to assessing the ecological integrity of New Zealand's freshwaters. Science for Conservation. Department of Conservation, Christchurch. 86 pp.

Lovett A. & Schallenberg M. (2009). Sediment Accumulation and Dynamics in the Tidal, Waipori/Waiholo Lake-Wetland Complex, Otago. Prepared for the Otago Regional Council. 30 pp.

Drake D., Kelly D., Schallenberg M., Ponder-Sutton A. & Enright M. (2009). Shallow coastal lakes in New Zealand: assessing indicators of ecological integrity and their relationships to broad-scale human pressures. Prepared for the Department of Conservation. NIWA Client Report: CHC2009-005. 55 pp.

Larned S. & Schallenberg M. (2006). Constraints on phytoplankton production in Lake Ellesmere/ Te Waihora. Report RU06/38. Environment Canterbury, Christchurch. 37pp.

Schallenberg M. & Tyrrell C. (2006). Report on risk assessment for aquatic flora of Waituna Lagoon. Prepared for the Department of Conservation. Invercargill. 55 pp.

Larned S., Biggs, B., Blair, N., Burns C., Jaarvie B., Jellyman D., Jellyman, P., Leathwick J., Lister K., Nagel, J., Schallenberg M., Sutherland S., Sykes J., Thompson W., Vopel, & Wilcock, B. (2006). Ecology of *Didymosphenia geminata* in New Zealand: habitat and ecosystem effects – Phase 2. Prepared for Biosecurity New Zealand. NIWA Client Report: CHC2006-086. 53 pp.

Limnology reports for stakeholders (not commissioned):

Reid, T. & Schallenberg M. (2009). Limnology survey of four drinking water reservoirs, Dunedin (summer 2008/09). Limnology Report No. 11, Department of Zoology, University of Otago. 22 p.

Schallenberg, M. & Burns C.W. (2004) The Waipori/Waiholo Lake-Wetland Complex: summary of research programme (1997-2003) and recommendations. Limnology Report No. 10, Department of Zoology, University of Otago. 16 p.

Schallenberg M. & Waite E. (2004) Survey of aquatic macrophytes in Lake Waiholo - summer 2002-2003. Limnology Report No. 9 Department of Zoology, University of Otago. 18 p.

Schallenberg, M. & Krebsbach, A. (2002) Assessment of antimicrobial (antibiotic) activity in surface water of the lower Taieri Plain and impacts on native bacteria in Lake Waipori. Limnology Report No. 8. Department of Zoology, University of Otago. 20 p.

Schallenberg, M. & Burns, C.W. (2001) Nitrogen and phosphorus budgets of the Waipori/Waihola Lake-Wetland Complex. Limnology Report No. 7. Department of Zoology, University of Otago. 26 p.

Schallenberg, M. & Krebsbach, A. (2001) Salinity in the Taieri Estuary and the Waipori/Waihola Lake-Wetland Complex, summer and autumn, 2001 - a brief report. Limnology Report No. 6, Department of Zoology, University of Otago. 9 p.

Schallenberg, M., Peake, B.M. & Burns, C.W. (2000) Hydrological mass-balance model of the Waipori/Waihola Lake-Wetland Complex: evidence of significant groundwater input. Limnology Report No. 5, Department of Zoology, University of Otago. 19 p.

Schallenberg, M., Bishop, J.N., Copson, J. & Burns, C.W. (2000) Effect of inflows from the Taieri Main Drain and the Taieri River on water quality and planktonic organisms in Lake Waipori. Limnology Report No. 4, Department of Zoology, University of Otago. 30 p.

Schallenberg, M. & Burns, C.W. (1999) The trophic state of lake Wakatipu: past, present and future. Limnology Report No. 3. Department of Zoology, University of Otago, Dunedin. 16 p.

Schallenberg, M. & Burns, C.W. (1999) Ecological effects of inorganic suspended sediments on lake plankton in some South Island lakes. Limnology Report No. 2. Department of Zoology, University of Otago, Dunedin. 9 p.

Schallenberg, M. & Burns, C.W. (1997) Report on phytoplankton biomass and productivity in lake Dunstan and in the Frankton Arm of Lake Wakatipu. Limnology Report No. 1. Department of Zoology, University of Otago, Dunedin. 8 p.

6. CONFERENCE PRESENTATIONS

Invited keynote:

2008: Lakes Water Quality Society Symposium, Rotorua. "What are nutrient-sensitive zones and why do we need to manage nutrients at the catchment scale?"

2006: Public forum, New Zealand Freshwater Society Conference, Rotorua. "The state of New Zealand's lakes - why is it deteriorating?"

International (1999 to present):

2011: Joint Australian Limnological Society/New Zealand Freshwater Science Society Conference, Brisbane, Australia. "Can Freshwater Ecological Integrity and Intensive Catchment Land Use Co-exist? Evidence from 46 Shallow New Zealand Lakes."

2007: International Society for Limnology Conference, Montreal. "Patterns of nutrient stoichiometry and algal nutrient limitation from headwaters to estuary". I also co-organised and co-convened a special session on "Catchment-scale limnology".

2003: International Conference on Environmental Future, Zurich. "Climate-induced salinity increase: effects on zooplankton in a coastal lake". (poster)

2003: Joint Australian Limnological Society/New Zealand Limnological Society Conference, Warnambool, Australia.

2001: International Society for Limnology Conference, Melbourne. "Effects of salinity on zooplankton in a tidal, coastal lake in New Zealand."

1999: International Lake Environment Committee Conference, Copenhagen.

New Zealand Freshwater Sciences Society conferences:

I have given at least one scientific presentation at every NZFSS conference since 1994.

Other presentations:

I give on average 4-5 presentations per year to research groups, regional councils, DoC, and community groups about the lake research that I carry out.

Workshops:

I have been invited to attend and present at numerous workshops organised mainly by NIWA, Landcare, community groups and regional councils.

7. HEARINGS AND ADVICE

In addition to commissioned reports that I have authored, I have been active as an expert witness in hearings and as a technical consultant (advice).

- 2011 Appointed by Environment Southland as member of the technical advisory group for Waituna Lagoon.
- 2011 Preparing evidence for the Department of Conservation for environment court hearings on the Mokihinui hydroelectric development.
- 2009 Appointed by the Minister of Conservation as a member of the Guardians of Lakes Monowai, Manapouri and Te Anau (3 year term).
- 2009 Expert witness for Environment Canterbury in the consent hearings for the Upper Waitaki irrigation development.
- 2008 Expert witness for the Department of Conservation at West Coast Regional Council hearings concerning the proposed Mokihinui Dam
- 2006 Expert witness for the Department of Conservation at Environment Southland hearings concerning the updating of Environment Southland's water plan
- 2005 Submitter and scientific advisor regarding Otago Regional Council consent hearing concerning the continued use of copper sulphate algicide in drinking water reservoirs by the Dunedin City Council

- 2002 Expert witness for the Save Mahinerangi Society Inc. at Environment Court, concerning the renewal of TrustPower Ltd's resource consents for the Lake Mahinerangi Dam
- 2001 Expert witness for Protect Our Oceans Inc. at Otago Regional Council hearings concerning Dunedin City Council resource consents to discharge Dunedin's untreated sewage into the ocean at Tahuna

I also provide technical advice informally on a regular basis to regional councils, the Department of Conservation and numerous community groups concerning water issues.

8. RESEARCH GRANTS

2011-2014	\$200K	FRST (via NIWA) – Effects-based Protection and Management of Aquatic Ecosystems programme and Aquatic Rehabilitation programme (with Carolyn Burns)
2011	\$20K	DoC funding for research on nutrient limitation in Waituna Lagoon
2010	\$170K	FRST (via NIWA) - Multiple Stressors programme and Restoration programme (with Carolyn Burns)
2009-2012	\$50K p.a.	Otago Regional Council - Amy Weaver's PhD scholarship for work on Lakes Wanaka and Wakatipu (with Carolyn Burns)
2009	\$3.5K	Otago Regional Council - Abbey Lovett's Summer Bursary scholarship for work on Lake Waiholo
2009	\$25K	DoC - Sarai Cosgrove's MSc Scholarship for work on Waituna Lagoon
2008-2009	\$20K p.a.	NIWA - for work on Lake Ellesmere
2006	\$10K	DoC - for work on Waituna Lagoon macrophytes
2004-2009	\$170K p.a.	FRST (via NIWA) - Multiple Stressors and Restoration (with Carolyn Burns)
2003	\$35K	UORG - <i>Campylobacter</i> work (with Carolyn Burns and Phil Bremer)
2001-2003	\$104K p.a.	FRST - <i>Southern Aquatic Ecosystems and Biodiversity</i> (with Carolyn Burns)
2000	\$24K	UORG - Impacts of multiple stressors on pelagic processes in wetlands
1999-2000	\$104K p.a.	FRST - <i>Southern Aquatic Ecosystems and Biodiversity</i> (with Carolyn Burns)
1999	\$38K	UORG - <i>Water-borne Pathogens in Otago</i> (with Carolyn Burns and Philip Weinstein)
1999	\$20K	Otago Regional Council - <i>Pelagic Processes in Lakes</i>
1997-98	\$104K p.a.	FRST - <i>Pelagic Processes in Lakes</i> (with Carolyn Burns)
1997	\$20K	UORG - <i>Pelagic Processes in Lakes</i> (with Carolyn Burns)
1997	\$22K	UORG - <i>Pelagic Processes in Lakes</i> (with Carolyn Burns)
1995	\$13K	Lottery Science Grant (with Carolyn Burns)
1994-96	\$110K p.a.	FRST - <i>Pelagic Processes in Lakes</i> (with Carolyn Burns)

9. STUDENT SUPERVISION/CO-SUPERVISION

PhD Students

Vanessa Hammond	Zoology	continuing
Amy Weaver	Zoology	continuing
Tina Bayer	Zoology	continuing
Beate Bierschenk	Zoology	continuing
Adrian Lill	Zoology	completed
Katrin Geist	Zoology	withdrew

MSc Students

Sarai Cosgrove	Ecology	completed
Ian Smith	Env. Sci.	completed
Theresa Downs	Ecology	completed
Tina Bayer	Env. Sci.	completed
Rob Cadmus	Ecology	completed
Adrian Lill	Ecology	completed
Michelle Brunton	Mar. Sci.	completed

PGDipSci Students

Katrina Spencer	Ecology	completed
Udo Friedrich	Zoology	completed

Honours Students

Daniel Thomas	Ecology	completed
Lynda McCann	Ecology	completed

10. TEACHING

Experience

ZOOL416 Freshwater Ecology (1995 - present)

I have been a member of the ZOOL416 teaching team for 14 years. I initiated a major research component in this paper which involves the students carrying out a meta-analysis on their own research hypothesis, based on data they are able to collect from the literature and unpublished sources. This study is then presented in a 15 minute seminar and written up in the format of a scientific manuscript for submission to a journal.

ZOOL318 Freshwater Ecology (2004 - present)

I have been a member of the ZOOL318 teaching team for 5 years, although I have had less formal associations with the paper (as Carolyn's Tomahawk Lagoon teaching assistant) for at least 10 years. Nowadays, I provide ideas for student projects, supervise the projects and increasingly contribute to presenting lectures (c. 10 lectures in 2008 and 2009).

ECOL313 Ecology Field Course (5 field courses)

I am an enthusiastic participant in the ECOL313 field course and have run a limnology module in this paper from the Bannockburn, Borland and Tautuku field camps. I love teaching this course as I perceive that the student obtain huge benefits from it. It is challenging and energy intensive to succeed at teaching this course. Nevertheless, it is my favorite paper to teach.

ECOL111 Introduction to Ecology (2010, 2012)

I have taught the module on population ecology, including a computer lab session in which the students develop simple population models in Excel.

ENVI401 Basic Principles of Environmental Science (2 years)

I have contributed to ENVI401 on two occasions, most recently running a palaeo-limnology module for the students, which involved a field trip and the students analysing some sediment core data, followed by the preparation of conference-style posters illustrating their results.

11. THESIS EXAMINATIONS

2009 - University of Waikato, PhD external examiner

2006 - University of Otago, PhD internal examiner

2006 - University of Waikato, PhD external examiner

2005 - University of Otago, MSc internal examiner

2005 - University of Tasmania, PhD external examiner

2002 - University of Otago, PhD internal examiner

2002 - University of Otago, MSc internal examiner

2001 - Victoria University, MSc external examiner

12. EDITING AND PEER REVIEWING

I have peer reviewed for:

1. Since 2010, I have been an associate editor of the New Zealand Journal of Marine and Freshwater Research
2. Peer reviewer for The Intergovernmental Panel on Climate Change 4th Assessment, Chapter 11
3. Reviewer for The National Science Foundation (USA) - a grant proposal
4. Peer reviewer for the NZ Ministry for the Environment
5. Peer reviewer for the Greater Wellington Regional Council
6. Have reviewed for the following journals:
 - Limnology and Oceanography
 - Freshwater Biology
 - Hydrobiologia
 - Journal of Plankton Research
 - New Zealand Journal of Marine and Freshwater Research
 - Marine and Freshwater Research
 - Frontiers of Ecology
 - Ecography
 - Archiv für Hydrobiologie
 - Internationale Revue der Gesamten Hydrobiologie
 - EcoHealth
 - Functional Ecology
 - Journal of the North American Benthological Society
 - Water Research
 - Journal of Environmental Quality
7. The University of Waikato Department of Biological Sciences - I have been the external examiner (reviewer of grading) for the final exams from the department's postgraduate freshwater ecology paper (2001 - present)

