

FRANK M. WILHELM

CONTACT

Department of Fish and Wildlife Resources
University of Idaho
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EDUCATION

- 1994-1999 **Ph.D.**, University of Alberta, Department of Biological Sciences
Supervisor: Dr. D. W. Schindler
- 1991-1993 **M.Sc.** Trent University, Watershed Ecosystems Graduate Program
Supervisor: Dr. D. C. Lasenby
- 1987-1991 **B.Sc. (Honours)**, Trent University, Biology/Environmental Resource Science
Supervisors: Drs. D. C. Lasenby and M. Fox

EMPLOYMENT HISTORY

- 2007- **Assistant Professor**, University of Idaho, Moscow, ID, USA
Adjunct faculty member, Department of Environmental Resources and Policy, Southern Illinois University, Carbondale, IL, USA
- 2001-2007 **Assistant Professor of Zoology**, Southern Illinois University, Carbondale, IL, USA
- 1999-2001 **NSERC Post-doctoral Researcher**, University of Otago, New Zealand
- 1998-1999 **University of Alberta Dissertation Fellowship**, University of Alberta, Canada
- 1996-1998 **Izaak Walton Killam Memorial Scholarship**, University of Alberta, Canada
- 1994-1996 **NSERC Post-graduate Scholarship**, University of Alberta, Canada
- 1993-1994 **Demonstrator/Technician**, Biology Department, Trent University, Canada
- 1994 **Contract**, Beak Consultants Limited, Trent Severn Waterway, Canada
- 1990-1993 **Teaching Assistant**, Biology Department, Trent University, Canada
- 1992 **Electron Microscopy Technician**, Biology Department, Trent University, Canada
- 1991 **NSERC Summer Research Award**, Biology Department, Trent University, Canada
- 1990 **NSERC Summer Research Award**, Biology Department, Trent University, Canada
- 1989 **Summer Research Assistant**, College of Biological Sciences, University of Guelph, and Department of Fisheries and Oceans Biological Station, St. Andrews, NB, Canada

RESEARCH FOCUS

My limnological research is focused on the examination of (i) surface- and (ii) ground water and (iii) the ecology and life history of benthic and epigeal invertebrates. The goal of the first two areas is to characterize and understand these environments; to recommend management strategies to improve water quality; and to examine the long-term effects of the implemented strategies. The focus of the third area is to understand the ecology of key invertebrates in aquatic ecosystems and to predict their response to changing environmental conditions. Thus, the first two research areas provide the environmental information necessary to place the biological and ecological findings in context.

Surface Water Research

Lakes and reservoirs are used for a variety of purposes including public drinking water supply, recreation and irrigation. Eutrophication and anoxic conditions are two major problems that impair water quality and use of many of these multi-purpose systems. My research focuses on the use of methods such as aeration and long-distance circulation to remediate and restore these water bodies. Because this represents a disturbance itself, I also examine the response of zooplankton communities to the methods implemented. In addition, I use GIS linked environmental visualization software to create time-series animations to effectively communicate results to the public, because changes in water chemistry often are not readily visible at the lake surface. For teaching purposes, I create and use easily accessible spreadsheet-based whole-lake models so students can explore lake dynamics.

Ground Water Research

The ground water research is focused in caves and wells of southern Illinois with the goal to relate water quality to surface land use. The cave research has been focused on understanding the biology of the federally listed Illinois cave amphipod. Plans are underway to expand this research to include multiple cave systems with contrasting surface-land uses to examine the linkages between water quality and cave-community composition. The ultimate goal of this research will be to protect underground communities and water resources. This is important because human survival is linked to the availability of clean water.

Ecology / Life History Strategy of Invertebrates

My research on the ecology and life history strategy of aquatic invertebrates, primarily amphipods and shrimp, aims to characterize their basic biology and determine their reproductive strategies across environmental gradients. The basic biology of many species remains to be discovered and provides an ideal training ground for students. By understanding reproductive strategies, I aim to develop models that predict the response of species to changes in environmental conditions such as those arising from climate warming. I am also interested in the lipid classes and dynamics of these invertebrates, as they may provide and an ideal alternative source of essential fatty acids currently derived from marine fish.

Collaborative Approach

I involve students (undergraduate and graduate) and colleagues in my research. I believe in a teamwork approach to draw on the knowledge and expertise of others to maintain rigorous scientific standards, reduce complex problems, and to cross disciplinary boundaries.

Refereed Publications:

- Wilhelm, F. M.** 2009. Pollution of aquatic ecosystems I. In G. E. Liken, editor. Encyclopedia of Inland Waters. Volume 3, pp 110-119. Oxford: Elsevier.
- Wilhelm, F. M.** and Venarsky, M. P. 2009. Variation in gnathopod morphology of cave amphipods and its use in determination of sex. *Journal of Crustacean Biology* 29: 26-33.
- Venarsky, M. P., Anderson, F. E. and **Wilhelm, F. M.** 2008. Population genetic study of the U.S. federally listed Illinois cave amphipod, *Gammarus acherondytes*. *Conservation Genetics*. DOI: 10.1007/s10592-008-9579-0
- Parker, B. R., Schindler, D. W., **Wilhelm, F. M.**, Donald, D. B. 2007. Bull trout population response to reductions in angler effort and retention limits. *North American Journal of Fisheries Management* 27: 848-859.
- Wilhelm, F. M.**, Closs, G. P., and Burns, C. W. 2007. The seasonal diet of juvenile common bully in a coastal South Island, New Zealand, lake. *Hydrobiologia* 586: 303-312.
- Venarsky, M. P., **Wilhelm, F. M.** and Anderson, F. E. 2007. Conservation strategies supported by non-lethal life history sampling of the U.S. federally listed Illinois cave amphipod, *Gammarus acherondytes*. *Journal of Crustacean Biology* 27:202-211.
- Lencioni, M*. 2006. Prey selection by *Chaoborus* in the field and laboratory. *Journal of Young Investigators* 15:1-9. [Undergraduate student supervised under a Southern Illinois University Office of Research and Development REACH (Research Enriched Academic Challenge) award].
- Panno, S. V., Hackley, K. C., Kelly, W. R., Hwang, H. H., **Wilhelm, F. M.**, Taylor, S. J. and Stiff, B. J. 2006. Potential effects of recurrent hypoxic conditions on the Illinois Cave amphipod. *Journal of Cave and Karst Studies* 68: 55-63.
- Venarsky, M. P. and **Wilhelm, F. M.** 2006. Use of clove oil to anaesthetize freshwater amphipods. *Hydrobiologia* 568: 425-432.
- Wilhelm, F. M.**, Taylor, S. J., and Adams, G. L. 2006. Comparison of routine metabolic rates of the stygobite, *Gammarus acherondytes* (Amphipoda: Gammaridae), and the stygophile, *Gammarus troglophilus*. *Freshwater Biology* 51:1162-1174
- Wilhelm, F. M.**, Venarsky, M. P.*, Taylor, S. J., and Anderson, F. E. 2003. Survival of *Gammarus troglophilus* (Gammaridae) after leg removal: Evaluation of a procedure to obtain tissue for genetic analysis of rare and endangered amphipods. *Invertebrate Biology* 122:369-374.
- Blais, J. M., **Wilhelm, F. M.**, Kidd, K. A., Muir, D. C. G., Donald, D. B., and Schindler, D. W. 2003. Concentrations of organochlorine pesticides and polychlorinated biphenyls in amphipods (*Gammarus lacustris*) along an elevation gradient in mountain lakes of western Canada. *Environmental Toxicology and Chemistry* 22: 2605-2613.
- Wilhelm, F. M.**, Hamann, J.* and Burns, C. W. 2002. Mysid predation on amphipods and *Daphnia* in a shallow coastal lake: prey selection and effects of macrophytes. *Canadian Journal of*

Fisheries and Aquatic Sciences **59**: 1901-1907.

- Wilhelm, F. M.** 2002. Estimating reproductive effort in small aquatic invertebrates from lipid dynamics. *Journal of Freshwater Ecology* **17**: 595-599.
- Wilhelm, F. M.**, and D. W. Schindler. 2000. Reproductive strategies of *Gammarus lacustris* (Crustacea: Amphipoda) along an elevation gradient. *Functional Ecology* **14**: 413-422. Featured in Editor's Choice *Science* **290**: 411.
- Wilhelm, F. M.** and Schindler, D. W. 2000. *Gammarus lacustris* (Crustacea: Amphipoda) zooplankton predation in a Canadian Rocky Mountain lake. *Verhaltenen der Internationalen Vereinigung für Limnologie* **27**: 783-784.
- Wilhelm, F. M.**, Schindler, D. W. and McNaught, A. S. 2000. The influence of experimental scale on estimating the predation rate of *Gammarus lacustris* (Crustacea: Amphipoda) on *Daphnia* in an alpine lake. *Journal of Plankton Research* **22**: 1719-1734.
- Wilhelm, F. M.**, Parker, B. R., Schindler, D. W. and Donald, D. B. 1999. Seasonal food habits of bull trout from a small alpine lake in the Canadian Rocky Mountains. *Transactions of the American Fisheries Society* **128**: 1176-1192.
- Wilhelm, F. M.**, Hudson, J. J. and Schindler, D. W. 1999. Contribution of *Gammarus lacustris* to phosphorus recycling in a fishless alpine lake. *Canadian Journal of Fisheries and Aquatic Sciences* **56**: 1679-1686.
- Wilhelm, F. M.** and Schindler, D. W. 1999. Effects of *Gammarus lacustris* (Crustacea: Amphipoda) on plankton community structure in an alpine lake. *Canadian Journal of Fisheries and Aquatic Sciences* **56**: 1401-1408.
- Wilhelm, F. M.**, Hardie, A. K., McNaught, A. S. and Clare, S. L.* 1998. Large suprabenthic *Daphnia middendorffiana* from an alpine lake in the Canadian Rocky Mountains. *Canadian Field Naturalist* **112**: 419-424.
- Wilhelm, F. M.** and Lasenby, D. C. 1998. Seasonal trends in the head capsule length and body length/weight relationships of two amphipod species. *Crustaceana* **71**: 399-410.
- Wilhelm, F. M.**, Lasenby, D. C., Wilhelm, R. M. and Plante, R. 1997. A new recorder for simultaneously recording the activity and oxygen consumption of small benthic invertebrates. *Canadian Journal of Fisheries and Aquatic Sciences* **54**: 2888-2893.
- Wilhelm, F. M.** and Lasenby, D. C. 1997. A sediment core sectioning method to minimize the post-sampling redistribution of organisms. *Aquatic Sciences* **59**: 34-38.
- Parker, B. R., **Wilhelm, F. M.** and Schindler, D. W. 1996. Recovery of *Hesperodiptomus* from diapausing eggs following elimination by stocked salmonids. *Canadian Journal of Zoology* **74**: 1292-1297.
- Wilhelm, F. M.** 1996. Comment on "Predation on *Mysis relicta* by Slimy Sculpins (*Cottus cognatus*) in southern Lake Ontario" J. Great Lakes Res. **21**: 275-283. *Journal of Great Lakes Research* **22**: 119-120.

Wilhelm, F. M. and Hiebert, J. A. 1996. A simple and inexpensive method to separate live and preserved benthos from sediments. *Journal of Freshwater Ecology* **11**: 119-121.

Non-refereed Papers:

Venarsky, M. P., **Wilhelm, F. M.** and Taylor, S. J. 2003. Cave amphipod respiration in southwestern Illinois. *Illinois Natural History Survey Reports* **375**: 2.

Wilhelm, F. M., Parker, B. R. and Schindler, D. W. 1998. Harrison Lake bull trout: a rare gem in the Canadian Rockies. *Banff National Park Research Updates* **1**: 6-7.

Wilhelm, F. M. 1998. Bull charr observations from a small sub-alpine lake. *Alberta Naturalist* **28**: 6-8.

Wilhelm, F. M. 1998. Bull char assessment. *The Bear and The Butterfly Summer 1998*: 3.

Wilhelm, F. M. and D. W. Schindler. 1996. Life at the top: the biology of the amphipod *Gammarus l. lacustris* in alpine lakes. *Research Links* **4**: 7-11.

Reports:

Wilhelm, F. M. 2008. Limnological assessment of a small pond near Bonners Ferry, Idaho. 10p Completed for Idaho Department of Fish and Game, Coeur D'Alene Regional Office.

Wilhelm, F. M. 2007. Bathymetric Mapping and Sediment Analysis of Candlewick Lake, Illinois. Final Report to Candlewick Lake Association, Poplar Grove, IL. v+18 pp.

Panno, S. V., Hackley, K. C., Kelly, W. R., Hwang, H. H., **Wilhelm, F. M.**, Taylor, S. J., and Stiff, B. J. 2004. Effects of water quality on populations of *Gammarus acherondytes* in two caves in southwestern Illinois. Final Report to Illinois Department of Natural Resources, Springfield, IL. 24 pp.

Muchmore, C., Stahl, J., Talley, E. and **Wilhelm, F. M.** 2004. Phase I Diagnostic/Feasibility Study of Campus Lake, Jackson County, Illinois. Final Report. Illinois Environmental Protection Agency, Springfield, IL. 203 pp.

Taylor, S. J., **Wilhelm, F. M.**, Adams, G. L. and Venarsky, M. P. 2003. Establishing baseline data on seasonal physiological requirements for *Gammarus acherondytes* and *Gammarus troglophilus* in relation to microbial demand. Illinois Natural History Survey Center for Biodiversity Technical Report 2003(20): 1-50.

Wilhelm, F. M., Taylor, S. J. and Adams, G. L. 2002. Establishing baseline data on seasonal physiological requirements for *Gammarus acherondytes* and *Gammarus troglophilus* in relation to microbial oxygen demand. 12 p. Progress Report #5 submitted to Division of Natural Heritage, Illinois Department of Natural Resources.

Taylor, S. J., **F. M. Wilhelm**, Adams, G. L. 2002. Establishing baseline data on seasonal physiological requirements for *Gammarus acherondytes* and *Gammarus troglophilus* in relation to microbial oxygen demand. 3 p. Revised Objectives and Deliverables. Submitted to Division of Natural Heritage Illinois Department of Natural Resources.

Taylor, S. J., Adams, G. L. and **Wilhelm, F. M.** 2001. Establishing baseline data on seasonal physiological requirements for *Gammarus acherondytes* and *Gammarus troglophilus* in relation to microbial oxygen demand. 9 p. Progress Report #4 submitted to Division of Natural Heritage, Illinois Department of Natural Resources.

Wilhelm, F. M. 1998. Seasonal diet and population assessment of bull charr (*Salvelinus confluentus*) in Harrison Lake, Banff National Park. 37 p. Report prepared for The Friends of Banff National Park.

Wilhelm, F. M. 1998. A preliminary *Gammarus* and rainbow trout diet analysis investigation in the Livingstone Trout Farm Main Pond. 24 p. Report prepared for Livingstone Trout Farm.

Wilhelm, F. M. 1992. Lake sediment bioturbation by *Diporeia hoyi*: the importance of determining organism stratigraphy in the sediments. 47 p. Trent University, Peterborough, Ontario, K9J 7B8.

Wilhelm, F. M. 1991. A water quality impact study of Burleigh Bay waters for the proposed development of the Stony Lake Estates Condominium Complex. 20 p. Trent University, Peterborough, Ontario, K9J 7B8.

Publication of Photographs

2007. Photograph published on Illinois Department of Natural Resources “Illinois Threatened and Endangered Species” poster.

2007. Back cover and article photograph for OutdoorIllinois 14(1) January issue.

2006. Cover photograph of Freshwater Biology 51(6) June issue.

Interactions with the Media

July 14th, 2006. Gave interview regarding Cave Hill Cave and aquatic biota in it to Brian DeNeal, staff writer for Daily Register. News article appeared in printed and online version of The Daily Register on Monday July 17th,

March 24th, 2003. Gave a TV interview to CBS-KFVS 12 for Lake lab as part of Illinois Junior Science and Humanities Symposium, Carbondale IL. Show appeared on the 18:00 nightly news.

January 5th, 2002. Gave a TV interview to Kirstin Millgate on lake ice formation and safety for ABC-WSIL 3, Carbondale IL. Show appeared on the 22:00 nightly news.

Theses:

Wilhelm, F. M. 1999. The ecology of *Gammarus lacustris* (Crustacea: Amphipoda:) in lakes of the Canadian Rocky Mountains. PhD thesis, University of Alberta, Edmonton, Alberta, Canada, T6G 2E9.

Department of Biological Sciences Nomination for Governor General’s Gold Medal for best PhD thesis at University of Alberta Fall 1999 Convocation.

Wilhelm, F. M. 1994. The growth, life history and respiration of *Diporeia* (Crustacea: Amphipoda) from two south central Ontario lakes. M.Sc. thesis, Trent University, Peterborough, Ontario, Canada K9J 7B8.

Wilhelm, F. M. 1991. The effects of low dissolved lake oxygen concentrations on gill surface area in *Pontoporeia hoyi* (Crustacea: Amphipoda). B.Sc. (Honours) thesis, Trent University, Peterborough, Ontario, Canada, K9J 7B8.

RESEARCH GRANTS (as P.I.)

- 2009 **Idaho Department of Fish and Game**
Determination of the role of *Mysis* in the nutrient budget of surface waters in Lake Pend Oreille and its relation to kokanee survival
Wilhelm, F. M.
- 2008 **University of Idaho Seed Grant Program**
Investigating mechanisms by which long distance circulation (LDC) enhances surface water quality
Wilhelm, F. M.
- 2008-2010 **US Geologic Service**
Investigating mechanisms by which long distance circulation (LDC) enhances surface water quality
Wilhelm, F. M.
- 2007-2012 **US Department of the Interior/US Fish and Wildlife Service**
A rearing protocol for the Illinois cave amphipod, *Gammarus acherondytes*, to supports its recovery.
Wilhelm, F. M.
- 2007 **Candlewick Lake Association**
Bathymetric Mapping and Sediment Analysis of Candlewick Lake, Illinois
Wilhelm, F. M.
- 2006-2011 **US Department of the Interior/US Fish and Wildlife Service**
A rearing protocol for the Illinois cave amphipod, *Gammarus acherondytes*, to supports its recovery.
Wilhelm, F. M.
- 2006-2007 **Lumpkin Family Foundation**
Summary and cost benefit analysis of projects to improve the water quality in Illinois Lakes.
Wilhelm, F. M.
- 2006-2007 **Illinois Environmental Protection Agency**
Monitoring the mixing of chloride in Living Light Ministry (Maru) Pond as part of its recovery.
Wilhelm, F. M.
- 2005-2006 **Southern Illinois University** (Undergraduate Student Technology Grant)

- A proposal to obtain 3 dimensional visualization and interpolation software at Southern Illinois University.
Wilhelm, F. M., Esling, S., Sun, W., Williard, K., Harpalani, S. and DeVantier, B.
- 2005 **Travel Grant** - Office of Research and Development, Southern Illinois University
 Supplemental grant to attend 6th International Crustacean Congress - Scotland, UK.
Wilhelm, F. M.
- 2005-2006 **US Department of Agriculture/US Forest Service**
 A bathymetric inventory of Lakes and Ponds on the Shawnee National Forest.
Wilhelm, F. M.
- 2005 **Southern Illinois University** (Graduate Student Technology Enhancement Grant)
 Technology to enhance groundwater related research in Zoology and Geology.
Wilhelm, F. M., and Esling, S.
- 2004-2007 **Illinois Environmental Protection Agency**
 Phase II long-term restoration and protection of Campus Lake.
 Wilhelm, F. M., Neuman, R. and Ruffing, A.
- 2004-2005 **US Department of Agriculture/US Forest Service**
 An inventory of biotic communities and water quality in homestead wells of the Shawnee National Forest: A first step to establish a groundwater monitoring network.
Wilhelm, F. M.
- 2004 **US Department of the Interior / US Fish and Wildlife Service**
 The population genetics and ecology of the Illinois cave amphipod.
Wilhelm, F. M.
- 2002-2003 **Faculty Research and Creative Grants** - Office of Research and Development, Southern Illinois University
 The ecology and lipid dynamics of amphipods in lakes of Southern Illinois.
Wilhelm, F. M.
- 2002 **Travel Grant** - Office of Research and Development, Southern Illinois University
 Supplemental grant to attend annual meeting of ASLO - Victoria, Canada
Wilhelm, F. M.
- 1999-2000 **Minor Equipment Grant** - Department of Zoology, University of Otago
Wilhelm, F. M.
- 1997-1999 **Canadian Circumpolar Institute/Alberta Boreal Research Grant**
 The importance of *Gammarus lacustris* in the regeneration of nutrients in small alpine and arctic lakes.
Wilhelm, F. M.
- 1997-1998 **Friends of Banff National Park Research Grant**
 An evaluation of the bull charr (*Salvelinus confluentus*) population and its diet seasonality in Harrison Lake, Banff National Park, Alberta, Canada.
Wilhelm, F. M.

- 1996-1998 **Izaak Walton Killam Memorial Scholarship Research Grant**
Wilhelm, F. M.
- 1995-1997 **Challenge Grants in Biodiversity (Alberta Environmental Protection)**
 An investigation of *Gammarus lacustris lacustris* (Crustacea: Amphipoda) life history from mountain lakes along an altitude gradient in southwestern Alberta.
Wilhelm, F. M.
- 1995-1997 **Canadian Circumpolar Institute/Alberta Boreal Research Grant**
 The life history and feeding habits of *Gammarus lacustris lacustris*, a crustacean amphipod in alpine and arctic lakes.
Wilhelm, F. M.

as Co-P.I.

- 2003-2004 **Illinois Department of Natural Resources**
 Differences in water quality between the upper and lower reaches of Illinois Caverns: Potential effects on population s of *Gammarus acherondytes*.
 Panno, S. V., Hackley, K. C., Kelly, W. R., Hwang, H. H., **Wilhelm, F. M.**, Taylor, S. J.
- 2003-2004 **USDA Forest Service Shawnee National Forest**
 Illinois Spring Cave Fish
 Burr, B. M. Adams, G.L., **Wilhelm, F. M.**, Adams, R.
- 2003 **Division of Natural Heritage, Illinois Department of Natural Resources**
 Supplemental funds for: Establishing baseline data on seasonal physiological requirements for *Gammarus acherondytes* and *Gammarus troglophilus* in relation to microbial oxygen demand.
 January - June 30, 2003 (Total award beginning in 2000: \$20,912).
 Taylor, S. J. (INHS), and **Wilhelm, F. M.** (SIUC)
- 2001-2002 **Division of Natural Heritage, Illinois Department of Natural Resources / USFWS**
 Establishing baseline data on seasonal physiological requirements for *Gammarus acherondytes* and *Gammarus troglophilus* in relation to microbial oxygen demand.
 Taylor, S. J., **Wilhelm, F. M.**, Adams, G. L.
- 2000-2001 **Otago Research Grant (University of Otago)**
 Effects of climate change on coastal freshwater and brackish ecosystems.
 Burns, C. W., Schallenberg, M., **Wilhelm, F. M.**, Zehrer, R., Floeder, S., Fitzharris, B., Koons, P., Schulmeister, J.

TEACHING EXPERIENCE

- 2009- (Spring) **Advanced Limnology** (FISH 503 3 credit hours), College of Natural Resources, University of Idaho, Moscow, ID, USA.
- 2008- (Fall) **Introduction to Fish and Wildlife Profession** (FISH/WLF 102 1 credit hour), College of Natural Resources, University of Idaho, Moscow, ID, USA.

- 2008 **Natural Resources (NR 101** 1 credit hour), College of Natural Resources, University of Idaho, Moscow, ID, USA.
(Fall)
- 2007,2008 **Limnology (FISH 415** 4 credit hours), Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID, USA
(Fall)
- 2001-2006 **Limnology (ZOOL 415** 3 credit hours), Department of Zoology, Southern Illinois University, Carbondale, IL, USA
(Fall)
- 2006 **ZOOL 493 (Honors Research** 3 credit hours), Department of Zoology, Southern Illinois University
(Fall)
- 2003-2006 **ZOOL 118 (Principles of Animal Biology** 4 credit hours), Department of Zoology, Southern Illinois University, Carbondale, IL, USA.
(Spring)
- 2003-2006 **ZOOL 458 (Issues in Aquatic Ecology** 3 credit hours), Department of Zoology, Southern Illinois University, Carbondale, IL, USA.
(Spring)
- 2004 **ZOOL 493 (Honors Research** 3 credit hours), Department of Zoology, Southern Illinois University
(Fall)
- 2003 **ZOOL 493 (Honors Research** 3 credit hours), Department of Zoology, Southern Illinois University
(Fall)
- 2003 **ZOOL 493 (Honors Research** 3 credit hours), Department of Zoology, Southern Illinois University
(spring)
- 2001 **Assistant Lecturer (Freshwater Ecology ZOOL 416)**, Department of Zoology, University of Otago, Dunedin, New Zealand
Co-supervisor of John Henderson, post graduate Diploma of Science (Ecology).
- 2000 **Co-supervisor** of Juliane Hamann, 3rd year practicum student, from Technical University of Dresden, Germany - Practicum at University of Otago, Dunedin, New Zealand.
- 2000 **Teaching Assistant (Aquatic Ecology ZOOL 331)**, Department of Zoology, University of Otago, Dunedin, New Zealand.
- 1993-1994 **Demonstrator/Technician (Limnology BI 305 and Ecology BIES 202)**, Biology Department, Trent University, Peterborough, ON, Canada.
- 1990-1993 **Teaching Assistant (Ecology BIES 202)**, Biology Department, Trent University, Peterborough, ON, Canada.
- 1992 **Electron Microscopy Technician (Electron Microscopy BI 401)**, Biology Department, Trent University, Peterborough, ON, Canada.
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CONFERENCE PRESENTATIONS

* indicates undergraduate student

Gillespie, K. and **Wilhelm, F. M.** 2008. Advising 101: Getting your feet wet. University of Idaho Academic Advising Association 5th Annual Advising Symposium. Moscow, Idaho, USA. September 5, 2008.

Wilhelm, F. M. 2008. Using aerators to restore lakes: avoiding nutrient pumps. 23rd Annual Meeting of the Illinois Lake Management Association. Springfield, Illinois, USA. February 28-March 1, 2008.

Wilhelm, F. M. 2007. A touch of realism: service-learning in a natural sciences course - FISH 415 Limnology. Service-Learning Faculty Fellows Workshop. University of Idaho Career and Professional Planning, Moscow, ID, USA. December 18-20, 2007.

Wilhelm, F. M. and Martin, D. L. 2007. How effective are restorations focused on reducing phosphorus in Illinois lakes? 27th Annual Meeting of the North American Lakes Management Society. Orlando, Florida, USA. October 30 - November 2.

- Wahl, N. C., Zeigler, J. M., Whitley, G. W., Jacobs, A. M. and **Wilhelm, F. M.** 2007. Relationship between bluegill diet and cladoceran size in Campus Lake. 136th Annual meeting of the American Fisheries Society, San Francisco, California, USA. September 2-6.
- Wilhelm, F. M.**, Flood, S.* and Seifert, K.* 2007. The use of whole-lake aeration to restore a small pond impacted by a brine spill from oil and gas development. 22nd Annual Illinois Lake Management Association Conference, Q Center, St. Charles, Illinois, USA. February 22-24.
- Martin, D. L. and **Wilhelm, F. M.** 2007. The phosphorus reductions of draining and dredging a pond and a cost-benefit analysis of the project. 22nd Annual Illinois Lake Management Association Conference, Q Center, St. Charles, Illinois, USA. February 22-24.
- Wilhelm, F. M.**, Jacobs, Alicia, A. M., and Musgrove, C. S*. 2006. Aeration of Campus Lake: Controlling internal phosphorus loading and environmental visualization of the whole-lake aeration. 26th Annual Meeting of the North American Lake Management Society. Indianapolis, Indiana, USA. November 8-10
- Martin, D. L. and **Wilhelm, F. M.** 2006. Draining and dredging of a pond as a watershed management strategy to improve the water quality of a downstream lake. 26th Annual Meeting of the North American Lake Management Society. Indianapolis, Indiana, USA. November 8-10.
- Jacobs, A. M. and **Wilhelm, F. M.** 2006. The impact of a reservoir management strategy on the zooplankton community in the Illinois EPA Clean Lakes Phase II Restoration of Campus Lake. . 26th Annual Meeting of the North American Lake Management Society. Indianapolis, Indiana, USA. November 8-10. Abstract accepted for poster presentation.
- Jacobs, A. M., **Wilhelm, F. M.** 2006. The impact of artificial lake destratification on the zooplankton community in the Phase II restoration of Campus Lake. 26th Annual Midwest Ecology and Evolution Conference, Washington University, St. Louis, Missouri, USA. March 17-19.
- Wilhelm, F. M.**, Jacobs, A. M. and Musgrove, C. S*. 2006. Estimating and visualizing the whole-lake effect of year 1 aerator operation on physical and chemical parameters in the Phase II restoration of Campus Lake. 21st Annual Illinois Lake Management Association Conference, Eagle Creek Resort & Conference Center, Lake Shelbyville, Illinois, USA. March 9-11.
- Jacobs, A. M., **Wilhelm, F. M.** and Musgrove, C. S*. 2006. The impact of lake destratification on the zooplankton community in the Phase II restoration of Campus Lake. 21st Annual Illinois Lake Management Association Conference, Eagle Creek Resort & Conference Center, Lake Shelbyville, Illinois, USA. March 9-11.
- Martin, D. L. and **Wilhelm, F. M.** 2006. The efficacy of pond draining and dredging as a watershed management strategy to improve the water quality of Campus Lake. 21st Annual Illinois Lake Management Association Conference, Eagle Creek Resort & Conference Center, Lake Shelbyville, Illinois, USA. March 9-11.
- Wilhelm, F. M.**, Wongsopawiro, D., Arts, M. T. 2005. Seasonal lipid dynamics and inter-annual differences in life history characteristics of the grass shrimp, *Palaemonetes kadiakensis*, in a Midwestern US lake. 6th International Crustacean Congress, University of Glasgow, Glasgow, Scotland. July 18-22.

- Venarsky, M. P., Anderson, F. E., Abbasi, W.*, and **Wilhelm, F. M.** 2005. Population genetics and phylogenetic position of the endangered Illinois cave amphipod *Gammarus acherondytes*. Annual Meeting of the Society of Systematic Biologists. University of Alaska, Fairbanks, Alaska, USA. June 11-14.
- Venarsky, M. P., **Wilhelm, F. M.**, Anderson, F. E. and Taylor, S. J. 2005. Life history and reproductive timing of the endangered Illinois cave amphipod. 53rd Annual Meeting of the North American Benthological Society, New Orleans, Louisiana, USA. May 22-27.
- Venarsky, M. P., Anderson, F. E., **Wilhelm, F. M.**, and Taylor, S. J. 2005. Population genetics of the endangered Illinois cave amphipod, *Gammarus acherondytes* (Gammaridae). 25th Annual Midwest Ecology and Evolution Conference, Carbondale, Illinois, USA. March 11-13, 2005.
- Taylor, S. J., **Wilhelm, F. M.**, Venarsky, M. P.*, and Adams, G. L. 2003. Oxygen consumption / body mass relationships of *Gammarus acherondytes* and *G. troglophilus* (Amphipoda) in an Illinois cave. National Speleological Society Annual meeting, CA. USA. August 1-5.
- Wilhelm, F. M.**, Taylor, S. J., Venarsky, M. P.*, and Adams, G. L. 2003. Oxygen consumption of *Gammarus acherondytes* and *G. troglophilus*, two cave amphipods from Illinois Caverns. The Crustacean Society Annual Conference, Williamsburg, VA. USA. June 1-5.
- Wilhelm, F. M.**, Burns, C. W., and Schindler, D. W. 2002. The response of aquatic invertebrates to climate change: Predictions from temperature-mediated reproductive strategies. American Society of Limnology and Oceanography Annual Conference, Victoria Conference Centre, Victoria, B. C. Canada. June 10-14.
- Wilhelm, F. M.** 2001. Climate warming and the fate of aquatic invertebrates: Using seasonal reproductive strategies to predict long-term trends in populations. DIALOG IV (Dissertations Initiative for the Advancement of Limnology and Oceanography), Bermuda Biological Station for Research, Bermuda. October 13-20.
- Wilhelm, F. M.** 2001. Amphipods on top of the world. DIALOG IV (Dissertations Initiative for the Advancement of Limnology and Oceanography), Bermuda Biological Station for Research, Bermuda. October 13-20.
- Blais, J. M., **Wilhelm, F. M.**, Kidd, K. A., Muir, D. C. G., Donald, D. B. and Schindler, D. W. 2001. Organochlorine pesticide and PCB concentrations in amphipods (*Gammarus lacustris*) along an elevation gradient in mountain lakes of Banff National Park, Canada. Aquatic Toxicity Workshop, Winnipeg, Canada. September 30-October 04.
- Wilhelm, F. M.** and Burns, C. W. 2001. Predation by mysids on amphipods: An overlooked interaction in aquatic ecosystems. XXVIII Societas Internationalis Limnologiae Congress, Melbourne, Australia. February 4-10.
- Wilhelm, F. M.** and Burns, C. W. 2000. The life history of *Paracalliope fluviatilis* (Crustacea: Amphipoda) in a South Island, New Zealand lake: Implications of warmer temperatures. Annual Conference of the New Zealand Limnological Society, Christchurch, New Zealand. November 20-24.
- Wilhelm, F. M.** and Schindler, D. W. 1999. The life history strategy of *Gammarus lacustris*

- (Crustacea: Amphipoda) in lakes at different elevations in the Canadian Rocky Mountains: Predictions for climate change. Annual Conference of the New Zealand Limnological Society, Wairakei, New Zealand. November 29-December 3.
- Parker, B.R. and **Wilhelm, F. M.** 1999. Harrison Lake Bull Trout. Ecology and Management of Northwest Salmonids: Bull trout II Conference. Canmore, Alberta, Canada. November 17-20.
- Wilhelm, F. M.**, Hudson, J. J. and Schindler, D. W. 1999. Benthic to pelagic phosphorus transport by the amphipod *Gammarus lacustris* in an alpine lake. 18th Annual Conference of the Society of Canadian Limnologists. Edmonton, Alberta. January 7-10.
- Wilhelm, F. M.**, Parker, B. R. Schindler, D. W. and Donald, D. B. 1998. Bull charr (*Salvelinus confluentus*): A desirable species in small mountain lakes. 18th International Symposium of the North American Lake Management Society, Banff, Alberta, Canada. November 10-13.
- Wilhelm, F. M.** and Schindler, D. W. 1998. *Gammarus lacustris* (Crustacea: Amphipoda) zooplankton predation in a Canadian Rocky Mountain alpine lake. XXVII Societas Internationalis Limnologiae Congress, Dublin, Ireland. August 9-14.
- Wilhelm, F. M.** 1997. *Gammarus* survival under bull trout predation in a sub-alpine Rocky Mountain lake. Graduate Student Research Symposium, University of Alberta, Edmonton, Alberta, Canada. October 24-25.
- Wilhelm, F. M.** 1997. *Gammarus lacustris* life history trade-offs between prairie and alpine lakes in southwestern Alberta. Prairies University Biological Seminar, University of Alberta, Edmonton, Alberta, Canada. February 20-22.
- Wilhelm, F. M.** 1996. *Gammarus lacustris* - nocturnal marauders. Sharing Ideas: Graduate Student Research Symposium, Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada. November 8-9.
- Wilhelm, F. M.** 1996. *Gammarus lacustris* - pelagic predators from the benthos. 44th Annual Meeting of the North American Benthological Society, Kalispell, Montana, USA. June 3-7.
- Wilhelm, F. M.** 1996. High altitude amphipod research. The Future of Our Environment: research at the University of Alberta, Edmonton, Alberta, Canada. April 29-30.
- Wilhelm, F. M.** and Schindler, D. W. 1995. The life history of *Gammarus lacustris* (Crustacea: Amphipoda) from two southwestern Alberta alpine lakes. American Society of Limnology and Oceanography Annual Conference, University of Nevada, Reno, Nevada, USA. June 11-15.
- Wilhelm, F. M.** and Hiebert, J. A. 1995. A cheap and easy method to separate benthos from sediments (just add water!). 43rd Annual Meeting of the North American Benthological Society, Keystone, Colorado, USA. May 30-June 3.
- Wilhelm, F. M.** and Lasenby, D. C. 1995. Activity and respiration rates of *Diporeia hoyi* (Crustacea: Amphipoda) from two south central Ontario lakes. Prairies Universities Biological Seminar, University of Winnipeg, Winnipeg, Manitoba, Canada. February 16-18.
- Wilhelm, F. M.** and Lasenby, D. C. 1995. How useful are one-time head capsule length - body

size/weight relationships? 14th Annual Conference of the Society of Canadian Limnologists, Ottawa, Ontario, Canada. January 5-7.

Wilhelm, F. M. and Lasenby, D. C. 1993. Sediment processing by *Diporeia hoyi* from two south central Ontario lakes. American Society of Limnology and Oceanography Annual Conference, University of Alberta, Edmonton, Alberta, Canada. May 30-June 4.

Wilhelm, F. M., Wilhelm, R. M., Plante, R. and Lasenby, D. C. 1993. A new activity recorder for continuous monitoring of small invertebrates, even in substrates. 41st Annual Meeting of the North American Benthological Society, University of Calgary, Calgary, Alberta, Canada. May 25-30.

Wilhelm, F. M. and Lasenby, D. C. 1993. Vertical distribution of *Diporeia hoyi* in Twelve Mile Lake sediments. 12th Annual Conference of the Society of Canadian Limnologists, Trent University, Peterborough, Ontario, Canada. January 2-4.

Wilhelm, F. M. and Lasenby, D. C. 1993. Life history of *Diporeia hoyi* (Crustacea: Amphipoda) from two south central Ontario lakes. 12th Annual Conference of the Society of Canadian Limnologists, Trent University, Peterborough, Ontario, Canada. January 2-4.

Wilhelm, F. M. and Lasenby, D. C. 1991. The effect of low dissolved lake oxygen concentration on gill surface area in *Pontoporeia hoyi* (Crustacea: Amphipoda). Ontario Ethology and Ecology Colloquium, University of Guelph, Guelph, Ontario, Canada. May 12-14.

Wilhelm, F. M. 1991. The effect of low dissolved lake oxygen concentrations on gill surface area in the amphipod *Pontoporeia hoyi* (Crustacea: Amphipoda). Ontario Biology Day, McMaster University, Hamilton, Ontario, Canada. March 16.

INVITED PRESENTATIONS

Wilhelm, F. M. 2008. Pitfalls of using aerators to control nutrients in lakes. Idaho Water Resources Reserch Institute, Water Resources, Hydrology Seminar Series. University of Idaho, Moscow, Usa. April 02, 2008.

Wilhelm, F. M. 2008. Review of the Illinois EPA clean lakes program. Presented to IEPA Bureau of Water, Surface Water Section, Springfield, Illinois, USA. Feb 27.

Wilhelm, F. M. 2008. Using aerators to restore lakes: avoiding nutrient pumps. Inland Northwest Aqautic , Riparian, and Wetland Symposium. Eastern Washington University, Spokane, Washington, USA. February 22, 2008.

Wilhelm, F. M. 2006. Limnological aspects of Campus Lake. Guest speaker for Rotary Club of Carbondale-Breakfast meeting, Southern Illinois University, Carbondale, Illinois, USA. May 16.

Wilhelm, F. M. 2005. The respiration of cave amphipods and the restoration of Campus Lake. Center for Ecology Seminar Series, Southern Illinois University, Carbondale, Illinois, USA. October 5.

Wilhelm, F. M. 2005. Insights into the life history strategy of invertebrates at the extreme edge of

life” Watershed Ecosystems Graduate Program Seminar Series, Trent University, Peterborough, Ontario, Canada. May 19.

Wilhelm, F. M. 2001. Implications of climate change for populations of benthic invertebrates. Department of Zoology, Guelph University, Guelph, Ontario, Canada. September 24.

Wilhelm, F. M. 2001. Surprises from the deep: The ecology and role of amphipods in lakes. Department of Zoology, Southern Illinois University, Carbondale, Illinois, USA. March 5.

Wilhelm, F. M. 2000. Life at the top: The ecology of *Gammarus lacustris* in lakes of the Canadian Rocky Mountains. Entomological Society of New Zealand, Otago Branch, Dunedin, New Zealand. August 24.

Wilhelm, F. M. 2000. Life at the edge: The ecology of *Gammarus lacustris* in lakes of the Canadian Rocky Mountains. Zoology Seminar Series, Department of Zoology, University of Otago, Dunedin, New Zealand. March 17.

Wilhelm, F. M. 1999. Life at the edge: The ecology of *Gammarus lacustris* from alpine lakes in the Canadian Rocky Mountains. Biology Seminar Series, Biology Department, Trent University, Peterborough, Ontario, Canada. November 24, 1999.

Wilhelm, F. M. 1999. The ecology of *Gammarus lacustris* in mountain lakes: From life history to plankton community structure. Ecology Seminar Series, Department of Biological Sciences, University of Calgary, Calgary, Alberta, Canada. February 24.

Wilhelm, F. M. 1997. An overview of amphipod and bull trout research in Banff National Park. Grade 12 Biology, Margaret Barbour Collegiate Institute, The Pas, Manitoba, Canada. November 10.

Wilhelm, F. M. 1997. An evaluation of the bull charr (*Salvelinus confluentus*) population and its diet seasonality in Harrison Lake, Banff National Park, Alberta, Canada. The Friends of Banff National Park, Banff, Alberta, Canada. May 26.

WORKSHOPS ATTENDED

30th International Kokanee Workshop, Idaho Fish and Game, Coeur D’Alene Regional Office sponsored workshop. Red Lion, Templins Hotel, Post Falls, Idaho, USA. March 25, 2009.

Service-Learning Faculty Fellows Workshop. University of Idaho Career and Professional Planning, Moscow, ID, USA. December 18-20, 2007.

4th Annual Advising Symposium. University of Idaho, Moscow, Idaho, September 7, 2007.

Future Directions in Karst Research. Karst Waters Research Institute, San Antonio, TX, USA. May 3-5, 2007.

New Approaches and Techniques for Teaching Science: Addressing Environmental Problems to Stimulate Undergraduate Learning. National Science Foundation sponsored workshop. Bemidji State University, Bemidji, Minnesota, June 15-19, 2003.

C2000 Karst Short Course. Taught by Ozark Underground Laboratories. Monroe County Annex, Waterloo, IL, USA, March 12, 2003.

DIALOG IV (Dissertation Initiative for the Advancement of Limnology and Oceanography. Bermuda Biological Station for Biological Research, St. Georges, Bermuda, October 13-20, 2001.

4th International Workshop on Ecosystem Manipulation. Palisades Centre, Jasper National Park, Alberta, Canada, October 14-17, 1997.

3rd Canadian Continuous-Flow Isotope Ratio Mass-Spectrometry Workshop. National Hydrology Research Institute, Saskatoon, Saskatchewan, Canada, September 9-11, 1996.

The Interactions of Climate Change, Increasing UV-B Exposure and Dissolved Organic Carbon, and their Implications for Aquatic Ecosystems. Palisades Centre, Jasper National Park, Alberta, Canada, November 4-7, 1994.