

Curriculum Vitae

Derek K. Gray

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EMPLOYMENT

Assistant Professor, 2016-present, Department of Biology, Wilfrid Laurier University, Waterloo, ON

Assistant Professor, 2013-2016, Department of Biological and Environmental Sciences, California University of Pennsylvania, California, Pennsylvania.

Postdoctoral Associate, 2012-2013, National Center for Ecological Analysis and Synthesis, University of California Santa Barbara, Santa Barbara, California. Supervisor: Dr. Stephanie Hampton.

EDUCATION

Ph.D., 2008-2011, Department of Biology, Queen's University, Kingston, Ontario, Advisor: Dr. Shelley Arnott.

M.Sc., 2005-2007, Great Lakes Institute for Environmental Research, University of Windsor, Windsor, Ontario, Advisor: Dr. Hugh MacIsaac.

B.Sc., 2000-2004, Department of Biological Sciences, University of Windsor, Windsor, Ontario.

TEACHING EXPERIENCE

Instructor of record at California University:

Contemporary Issues in Biology, 2013-2015
Introduction to Environmental Science, 2014, 2015
Experimental Design and Analysis, 2013-2015
General Zoology, 2014-2016
General Ecology laboratory, 2014, 2015
Aquatic Invertebrate Zoology, 2016

Supervision of undergraduate research:

Stephanie Nalbone (2016). Zooplankton communities of Pittsburgh Area Rivers.

Luv Biswa (2015). Impacts of the spiny waterflea (*Bythotrephes*) on zooplankton communities in the Allegheny River.

- Christina Santmyer (2014). California University of Pennsylvania. Rates of plastic accumulation on beaches along the southern shore of Lake Erie.
- Martha Roege (2014). California University of Pennsylvania. Documenting the diversity of zooplankton in the Allegheny River.
- Dylan Cohen (2013). California University of Pennsylvania. Detecting phenological change in Lake Baikal's zooplankton communities.
- Diana Zeng (2011). Queen's University. Measuring outward dispersal of zooplankton from lakes using wind socks and sterile microhabitats.
- Kimberley Lemmen (2010). Queen's University. Using resurrection ecology as a tool to evaluate the recovery of acid-damaged Killarney Provincial Park lakes.
- Theresa Patenaude (2008). Queen's University. Humans as dispersal vectors for zooplankton, and possible implications for recovery from acidification, in Killarney Provincial Park, Ontario, Canada.

REFEREED PUBLICATIONS

- Gray, D.K.**, Santmyer, C., Browne, M.A. 2016. Rapid accumulation of plastic debris on southern Lake Erie beaches. *Journal of Great Lakes Research*. *In review*.
- Izmest'eva, L.R., Moore, M.V., Hampton, S.E., Ferwerda, C.J., **Gray, D.K.**, Woo, K., Pislegina, H.V., Krashchuk, L.S., Shimaraeva, S.V. and Silow, E.A. 2015. Lake-wide physical and biological trends associated with warming in Lake Baikal. *Journal of Great Lakes Research* 42: 6-7.
- O'Reilly, C.M.*, **Gray, D.K.***, Sharma, S.*, Hampton, S.E.*, Read, J.S. and ~50 additional coauthors. 2015. Rapid and highly variable warming of surface waters around the globe. *Geophysical Research Letters*. 42. doi: 10.1002/2015GL066235. ***Joint first authors**
- Sharma, S.*, **Gray, D. K.***, Read, J. S.*, O'Reilly, C. M.*, Schneider, P., Quadrat, A. and ~50 additional coauthors. 2015. A global database of lake surface temperatures (1985-2009) collected by in situ and satellite methods. *Nature Scientific Data* 2, Article number: 150008, doi:10.1038/sdata.2015.8 ***Joint first authors**
- Argent, D.G., W.G. Kimmel, **D.K. Gray**, B. Deleonibus, and D. Drescher. 2014. Invasion of the Allegheny River by the spiny water flea (*Bythotrephes longimanus*). *Bioinvasions Records*. doi:10.3391/bir.2014.3.2.06.
- Hampton, S.E., **D.K. Gray**, M.V. Moore, T. Ozersky, L.R. Izmest'eva. 2014. The rise and fall of plankton: long-term changes in the vertical distribution of algae and grazers in Lake Baikal, Siberia. *PLOS ONE*, doi: 10.1371/journal.pone.0088920
- Gray, D.K.** and S.E. Arnott. 2012. The role of dispersal levels, Allee effects, and community resistance as zooplankton communities respond to environmental change. *Journal of Applied Ecology* 49: 1216-1224.
- Gray, D.K.**, S.E. Arnott, J.A. Shead, and A.M. Derry. 2012. The recovery of acid-damaged zooplankton communities in Canadian lakes: the relative importance of abiotic variables, biotic variables, and dispersal. *Freshwater Biology* 57: 741-758.
- Gray, D.K.** and S.E. Arnott 2011. The interplay between environmental conditions and Allee effects during the recovery of stressed zooplankton communities. *Ecological Applications* 21: 2652-2663.

- Gray, D.K.** and S.E. Arnott. 2011. Does dispersal limitation impact the recovery of zooplankton communities damaged by a regional stressor? *Ecological Applications* 21: 1241-1256.
- Gray, D.K.** and H.J. MacIsaac. 2010. Diapausing zooplankton eggs remain viable despite exposure to open-ocean ballast water exchange: evidence from *in-situ* exposure experiments. *Canadian Journal of Fisheries and Aquatic Sciences* 67: 417-426.
- Gray, D.K.**, and S.E. Arnott. 2009. Recovery of acid damaged zooplankton communities: measurement, extent, and limiting factors. *Environmental Reviews* 17: 81-99.
- J.R. Muirhead, **D.K. Gray**, D.W. Kelly, S.M. Ellis, D.D. Heath and H. J. MacIsaac. 2008. Identifying the source of species invasions: sampling intensity vs. genetic diversity. *Molecular Ecology* 17: 1020-1035
- Bailey, S.A., D.W. Kelly, **D.K. Gray**, N. Kanavillil, and H.J. MacIsaac. 2008. Nonindigenous species in Lake Erie: A chronicle of established and projected aquatic invaders. Pages 579-603. *In: Checking the Pulse of Lake Erie*. M. Munawar and R. Heath (eds.), Aquatic Ecosystem Health and Management Society, Burlington, ON.
- Gray, D.K.**, T.H. Johengen, D.F. Reid and H.J. MacIsaac. 2007. Efficacy of open-ocean ballast water exchange as a means of preventing invertebrate invasions between freshwater ports. *Limnology and Oceanography* 52: 2386-2397
- Gray, D.K.**, I.C. Duggan, and H.J. MacIsaac. 2006. Can sodium hypochlorite reduce the risk of species introductions from diapausing invertebrate eggs in non-ballasted ships? *Marine Pollution Bulletin* 52: 689-695
- Gray, D.K.**, S.A. Bailey, I.C. Duggan, and H.J. MacIsaac. 2005. Viability of invertebrate diapausing eggs exposed to saltwater: implications for Great Lakes' ship ballast management. *Biological Invasions* 7: 531-539
- Duggan, I.C., S.A. Bailey, R.I. Colautti, **D.K. Gray**, J.C. Makarewicz & H.J. MacIsaac. 2003. Biological invasions in Lake Ontario: past, present and future. Pages 541-557 *in: M. Munawar (ed.) State of Lake Ontario: Past, Present and Future*. Backhuys Publishers, Leiden, the Netherlands.
- Grigorovich, I.A., A.V. Korniushev, **D.K. Gray**, I.C. Duggan, R.I. Colautti, and H.J. MacIsaac. 2003. Lake Superior: an invasion coldspot? *Hydrobiologia* 499: 191-210.

CONFERENCE PRESENTATIONS (*presenter)

- Gray, D.K.*** Rapid and highly variable warming of lakes around the globe. Youghiogheny River Symposium at Penn State Fayette. Lemont Furnace, Pennsylvania. June 2016
- Gray, D.K.***, Santmyer, C., and Browne, M.A. Rapid accumulation of plastic debris on southern Lake Erie beaches. 59th Annual Conference on Great Lakes Research. Guelph, Ontario. June 2016
- Hampton, S.E.*, Izmet'eva L.R, **Gray, D.K.**, Moore, M.V., and Ozersky, T. Implications of shifting plankton depth distribution over 45 years in Lake Baikal, Siberia. 9th Symposium for European Freshwater Sciences. Geneva, Switzerland. July 2015
- Gray, D.K.***, Sharma, S., Read, J., O'Reilly, C., Schneider, P., Lenters, J., Hook, S., Dong, B., Gries, C., Hampton, S., and GLTC contributors. A global database of lake surface temperatures collected

- by in situ and satellite methods from 1985-2009. 58th Annual Conference on Great Lakes Research. Burlington, Vermont. May 2015.
- Lenters, J.D.* , Read, J.S., Sharma, S., O'Reilly, C.M., Hampton, S., **Gray, D.K.**, McIntyre, P.B., Hook, S.J., Schneider, P., and GLTC contributors. Global record of lake surface temperature reveal a century of warming. 58th Annual Conference on Great Lakes Research. Burlington, Vermont. May 2015.
- Santmyer, C.* , and **Gray, D.K.** Rates of plastic accumulation on beaches along the southern shore of Lake Erie. 10th Annual Regional Science Consortium Research Symposium at the Tom Ridge Center at Presque Isle. Erie, Pennsylvania. November 2014.
- Gray, D.K.***, Read, J. Hook, S., Schneider, P., Lenters, J., Ruppert, J., O'Reilly, C., Sharma, S., Hampton, S. Impact of measurement frequency and data gaps on the calculation of summer-mean lake temperatures and warming trends. Joint Aquatic Sciences Meeting 2014, Portland, Oregon, May 2014.
- Lenters, J.D.* , Read, J.S., **Gray, D.K.**, Sharma, S., O'Reilly, C.M., Hook, S.J., Schneider, P., Hampton, S., McIntyre, P.B. Rapid warming of the world's lakes from in situ and satellite-based measurements. Joint Aquatic Sciences Meeting 2014, Portland, Oregon, May 2014.
- Roegge, M.A.* , **Gray, D.K.**, Argent, D.G., and Kimmel, W.G. Documenting the diversity of zooplankton in the Allegheny River. Commonwealth of Pennsylvania University Biologists Annual Meeting. Bloomsburg, Pennsylvania, April 2014.
- Gray, D.K.***, Izmet'eva, L., and Hampton. S.E. Long-term changes in the depth distribution of Lake Baikal plankton: a consequence of warming? Association for the Sciences of Limnology and Oceanography 2013 Aquatic Sciences meeting. New Orleans, Louisiana, February 2013.
- Hampton, S.E.* , O'Reilly, C.M. Sharma, S. **Gray, D.K.**, Read, J.S., Lenters, J.D., and Hook, S.J. Global lake warming trends and regional hotspots. Associated for the Sciences of Limnology and Oceanography 2013 Aquatic Sciences meeting. New Orleans, Louisiana, February 2013.
- Gray, D.K.***, Linley, R.D., Yan, N.D., Keller, W., and Arnott, S.E. Using two-phased species-time relationships to separate ecological dynamics from census error in the assessment of stressed communities. 96th Annual Meeting of the Ecological Society of America. Austin, Texas, August, 2011.
- Gray, D.K.***, and Arnott, S.E. The interplay between local environmental conditions and Allee effects in determining the population growth and establishment of a zooplankton species impacted by a regional stressor. Canadian Council for Fisheries Research and the Society of Canadian Limnologists meeting. Toronto, Ontario, January 2011
- Lemmen, K.D.* , **Gray, D.K.**, and Arnott, S.E. Species turnover of *Daphnia* in lakes of central Ontario. Canadian Council for Fisheries Research and the Society of Canadian Limnologists meeting. Toronto, Ontario, January 2011
- Gray, D.K.***, and Arnott, S.E. Does dispersal limitation impact the recovery of zooplankton communities damaged by a regional stressor? 95th Annual Meeting of the Ecological Society of America. Pittsburgh, Pennsylvania, August 2010.

- Gray, D.K.***, and Arnott, S.E. Dispersal and local environmental conditions interact to determine the probability of reestablishment for zooplankton species impacted by a regional stressor. Canadian Society for Ecology and Evolution Conference 2010. Quebec City, Quebec, May 2010.
- Gray, D.K.***, and Arnott, S.E. The role of dispersal in the recovery of acid-damaged zooplankton communities: sources of colonists for recovering lakes and the relative importance of regional vs. local variables. Canadian Society for Ecology and Evolution Conference 2009. Halifax, Nova Scotia, May 2009.
- Gray, D.K.**, Johengen, T.H., Reid, D.F.* & MacIsaac, H.J. Biological effectiveness of open-ocean ballast exchange for preventing invertebrate invasions between freshwater ports. 15th International Conference on Aquatic Invasive Species. Nijmegen, The Netherlands. September 2007
- Gray, D.K.**, Johengen, T.H., Reid, D.F. & MacIsaac, H.J*. Can open-ocean ballast exchange prevent invasions between freshwater ports? 5th International Conference on Marine Bioinvasions. Cambridge, Massachusetts., U.S.A. May 2007
- Gray, D.K.***, van Overdijk, C.D.A., Johengen, T.H., Reid, D.F. & MacIsaac, H.J. Does open-ocean ballast exchange prevent the transfer of invertebrates between freshwater ports? 14th International Conference on Aquatic Invasive Species. Key Biscayne, Florida, U.S.A. May 2006
- Gray, D.K.***, van Overdijk, C.D.A., Johengen, T.H., Reid, D.F. & MacIsaac, H.J. Does open-ocean ballast exchange reduce the risk of future Great Lakes' introductions from transoceanic vessels? 49th Annual Conference on Great Lakes Research. Windsor, ON, Canada. May 2006
- Gray, D.K.***, Bailey, S.A., Duggan, I.C. & MacIsaac, H.J. Viability of invertebrate diapausing eggs exposed to saltwater: implications for Great Lakes' ship ballast management. 13th International Conference on Aquatic Invasive Species. Ennis, County Clare, Ireland. September 2004.
- Gray, D.K.***, Duggan, I.C., Bailey, S.A. & MacIsaac, H.J. Can partial ballast exchange reduce the viability of resting stages in the ballast tanks of NOBOB Ships? 46th Conference on Great Lakes Research. Chicago, Illinois, U.S.A. June 2003.

FUNDING AWARDS

Name of Award	Value (\$)	Type	Period Held
FPDC Small Grant (Teaching development)	957	Institutional	2016/01-2016/05
PASSHE Annual Research Grant	9896	State	2014/05-2015/05
FPDC Small Grant (Research)	980	Institutional	2014/01-2014/05
E.G. Bauman Fellowship	15 000	Institutional	2010/09-2011/09
Alexander Graham Bell Canada Graduate Scholarship	35 000/year	National	2008/05-2010/05
Dean's Travel Grant for Doctoral Research	3 000	Institutional	2009
Queen's University Graduate Award	4 900	Institutional	2008/01-2008/04
NSERC Canada Graduate Scholarship-M	17 500/year	National	2005/05-2007/03
Ontario Graduate Scholarship	15 000/year	Provincial	2005/05-2006/05 (declined)
Ontario Graduate Scholarship in Science and Technology	15 000/year	Provincial	2005/05-2006/05 (declined)
University of Windsor Tuition Scholarship	5 316	Institutional	2005/01-2007/12