

# Curriculum Vitae

## Clayton J. Williams

Iowa State University, EEOB  
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### **Education**

2008 – Ph.D., Biology, Department of Biological Sciences, Florida International University, Miami, FL, USA.

Dissertation Title: “Relative significance of pelagic, benthic, and allochthonous organic matter to microbial carbon cycling in a phosphorus-depleted estuary”.  
Adviser: Dr. Frank J. Jochem

2000 – B.S., Evolutionary Ecology and Organismal Biology (Formerly: Zoology), The Ohio State University, Columbus, OH, USA.

2000 – B.S., Psychology, The Ohio State University, Columbus, OH, USA.

### **Research Interests**

My research provides local and global understandings of the impacts human activity and natural mechanisms have on terrestrial to aquatic biogeochemical cycles and microbial ecology. Broadly, I am interested in human-land-water interactions, the environmental consequences of these interactions, and developing sustainable socio-economic-environmental systems. Topically, my interests cover the impact of landscape change on water resources, ecosystem management, agriculture, urbanization, ecosystem stability, ecological scale, organism- to global-level metabolic processes, resource & energy cycles, heterotrophic bacteria, organic matter chemistry, chemical biomarkers, stable isotope biogeochemistry, flow cytometry, and GIS-based applications.

### **Professional Experience**

#### *Postdoctoral Research:*

Iowa State University, Department of Ecology, Evolution and Organismal Biology, Ames, Iowa, USA

2012 – Present; Biogeochemical Limnology and Lake Management  
Adviser: Dr. John A. Downing

Trent University, Department of Biology, Peterborough, Ontario, Canada

2010 – 2012; Ministry of Research and Innovation Postdoctoral Fellowship for outstanding young scientists; Aquatic Biogeochemistry  
Adviser: Dr. Marguerite A. Xenopoulos

2008 – 2010; Aquatic Microbial and Biogeochemical Ecology

Adviser: Dr. Marguerite A. Xenopoulos

#### *Mentorship Activities:*

Mallory Nadon; Fall 2011 – Spring 2013; Masters Candidate, Trent University, Environmental and Life Sciences Graduate Program, “The impact of altered flow regimes on Boreal stream function”

Pranab Das; 2008 – 2012, Ph.D. Dissertation, Trent University, Environmental and Life Sciences Graduate Program, “Determining the effect of nano-sized industrial materials (silver and titanium dioxide) on natural aquatic microbial community function.”

Katelyn E. Doughty; Summer 2011 – Spring 2012, Honors Undergraduate Thesis, Trent University, “Impacts of land use on nutrient cycling and metabolism of stream biofilms.”

Myra Juckers; Summer 2010 – 2012, Undergraduate Research Project, Trent University, “Impact of urbanization on denitrification and nutrient cycling in stream ecosystems.”

Robert Buchkowski; Summer 2009 & 2010, NSERC – Undergraduate Student Research Award, Trent University and Lakehead University, “The impact of nanosilver, zero-valent iron, and land use on denitrification in freshwater ecosystems.”

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Jennifer Van Eindhoven; 2009 – 2010, Honors Undergraduate Thesis, Trent University, “The effect of golf courses on fungal and bacterial communities in southern Ontario streams.”

Jacob Brownscombe; 2008 – 2009, Honors Undergraduate Thesis, Trent University, “The effect of agricultural land use on the bioavailability of dissolved organic carbon in stream ecosystems”

Nina Wong; 2007 – 2008, AP Environmental Science and National Science Fair Project (USA, senior level), “Impact of tides and culture media on bacterial enzymatic activity, morphology, and phylogeny.”

### *Academic Advising*

Florida International University, Department of Biological Sciences, Miami, Florida, USA

December 2006 – August 2007, Undergraduate Academic Advisor, Marine Biology Program

### *Course Instruction*

Des Moines Area Community College, Des Moines, Iowa, USA

Fall 2012, Introduction to Environmental Science Lecture and Laboratory

Trent University, Department of Biology, Peterborough, Ontario, Canada

Fall 2011, Limnology Lecture and Laboratory

### *Teaching Assistantships:*

Florida International University, Department of Biological Sciences, Miami, Florida, USA

Fall 2006, Ecology Laboratory

Summer 2006 & Fall 2004, 2003 General Biology II Laboratory

Spring 2005, 2004 Marine Biology and Oceanography Laboratory

Spring 2006 & Fall 2005, Human Biology Laboratory (Online Course)

Summer 2004, Introduction to Marine Biology Laboratory

### *Invited Lectures and Seminars:*

Trent University, Department of Biology, Peterborough, Ontario, Canada

Fall 2011, Honors Seminar. “Shining a light into the dissolved organic matter (DOM) of aquatic systems”

Fall 2011, Experimental and Observational Approaches to Ecology Workshop. “Aquatic community ecology: Microbial and chemical viewpoints”

Fall 2008, Honors Seminar. “Importance of seagrass as a carbon source for heterotrophic bacteria in a subtropical estuary (Florida Bay)”

Florida International University, Department of Biological Sciences, Miami, Florida, USA

Spring 2006, Limnology Lecture Course. “Microbial loop and carbon cycling in lake ecosystems”

### *Teaching Internships:*

Newfound Harbor Marine Institute, Big Pine Key, Florida, USA

Spring (January-May) 2003, Marine Ecology and Geology

### **Fellowships and Grants**

- Iowa Department of Natural Resources (primary author) (August 2012 to August 2013), Storm Lake, Iowa – \$143,618
- Ministry of Research and Innovation Postdoctoral Fellowship (2010 to summer 2012), Ontario, Canada
- Lake Simcoe Clean-Up Fund, Environment Canada (primary author) (August 2010 to March 2012) – \$159,950
- Dissertation Year Fellowship (2007 to 2008 academic year), University Graduate School, Florida International University, Miami, FL – \$40,000

### **Publications**

\*Indicates student co-author

**Williams, C.J.**, Frost, P.C., and Xenopoulos, M.A. In press. Beyond best management practices: pelagic biogeochemical dynamics in urban stormwater ponds. *Ecological Applications*.

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- Juckers\*, M., **Williams, C.J.**, and Xenopoulos, M.A. In press. Land use effects on net resource flux and O<sub>2</sub> demand in stream sediments. *Freshwater Biology*.
- Das\*, P., **Williams, C.J.**, Fulthorpe, R.R., Hoque, M.E., Metcalfe, C.D., and Xenopoulos, M.A. 2012. Changes in bacterial community structure after exposure to silver nanoparticles in natural waters. *Environmental Science and Technology* 46:9120-9128. doi: 10.1021/es3019918
- Williams, C.J.**, Scott, A.B., Wilson, H.F., and Xenopoulos, M.A. 2012. Effects of land use on water column bacterial activity and enzyme stoichiometry in stream ecosystems. *Aquatic Sciences* 74:483-494.
- Das\*, P., Xenopoulos, M.A., **Williams, C.J.**, Hoque, M.E. and Metcalfe C.D. 2012. Effects of silver nanoparticles on bacterial activity in natural waters. *Environmental Toxicology and Chemistry* 31:122-130.
- Williams, C.J.**, Yamashita, Y., Wilson, H.F., Jaffé, R., and Xenopoulos, M.A. 2010. Unraveling the role of land use and microbial activity in shaping dissolved organic matter characteristics in stream ecosystems. *Limnology and Oceanography* 55:1159-1171.
- McCarthy, M.J., Gardner, W.S., Lavrentyev, P.J., Jochem, F.J., and **Williams, C.J.** 2009. Water column nitrogen cycling and microbial plankton in Florida Bay. *Contributions in Marine Science* 38:49-62.
- Williams, C.J.**, Jaffé, R., Anderson, W.T., and Jochem, F.J. 2009. Importance of seagrass as a carbon source to heterotrophic bacteria in a subtropical estuary (Florida Bay). *Estuarine Coastal and Shelf Science* 85:507-514. doi: 10.1016/j.ecss.2009.09.019
- Williams, C.J.**, Boyer, J.N., and Jochem, F.J. 2009. Microbial activity and carbon, nitrogen, and phosphorus content in a subtropical seagrass estuary (Florida Bay): Evidence for limited bacterial use of seagrass production. *Marine Biology* 156:341-353.
- Williams, C.J.**, Lavrentyev, P.J., and Jochem, F.J. 2008. Bottom-up and top-down control of heterotrophic bacterioplankton growth in a phosphorus-deplete subtropical estuary (Florida Bay). *Marine Ecology Progress Series* 372:7-18.
- Williams, C.J.**, Boyer, J.N., and Jochem, F.J. 2008. Indirect hurricane effects on resource availability and microbial communities in a subtropical wetland - estuary transition zone. *Estuaries and Coasts* 31:204-214.
- Williams, C.J.** and Jochem, F.J. 2006. Ecto-enzyme kinetics in Florida Bay: Implications for bacterial carbon source and nutrient status. *Hydrobiologia* 569:113-127.

### **Manuscripts – In prep or review process**

- McEnroe, N.A., **Williams, C.J.**, Xenopoulos, M.A., Porcal, P., and Frost, P.C. In prep. Distinct optical chemistry of dissolved organic matter in small urban freshwater systems PLOS One.
- Williams, C.J.**, Van Eindhoven, J.E., Theberge, E., and Xenopoulos, M.A. in prep. Effects of golf course facilities on water quality, dissolved organic matter characteristics, and leaf decomposition in anthropogenically impacted streams. Anthropocene.

### **Scientific Presentations**

- Williams, C.J.**, and Xenopoulos, M.A. 2013. Point-scale carbon cycling and watershed-scale landscape influences on stream dissolved organic matter pools. Aquatic Sciences Meeting, Association for the Sciences of Limnology and Oceanography, New Orleans, Louisiana, USA
- Xenopoulos, M.A. Porter-Goff, E., Spooner, D.E., **Williams, C.J.**, and Wilson, H.F. 2013. The prevalence of nonlinearity and detection of ecological thresholds for dissolved organic matter, nutrients and ecosystem functions across land use gradients. Aquatic Sciences Meeting, Association for the Sciences of Limnology and Oceanography, New Orleans, Louisiana, USA
- Williams, C.J.**, Porter-Goff, E., Frost, P.C., and Xenopoulos, M.A. 2011. The impact of winter road salt and sand applications on benthic-pelagic nutrient cycling and oxygen demand in Lake Simcoe and its tributaries. Lake Simcoe Protection Plan Science Forum, Barrie, Ontario, Canada.
- Williams, C.J.**, Frost, P.C., and Xenopoulos, M.A. 2011. Environmental regulators on pico- and nanoplankton abundance and extracellular enzyme activity in urban stormwater ponds. Aquatic Sciences Meeting, American Society of Limnology and Oceanography, San Juan, Puerto Rico, USA.
- Morales\*, A.M., **Williams, C.J.**, Xenopoulos, M.A., and Frost P.C. 2011. Assessing the role of dissolved organic matter in the community structure and stoichiometry of lake pico- and nanoplankton. Aquatic Sciences Meeting, American Society of Limnology and Oceanography, San Juan, Puerto Rico, USA.
- Williams, C.J.**, and Xenopoulos, M.A. 2010. Effects of land use and spatial scale on dissolved organic

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matter structure and bacterial activity in streams. Joint Aquatic Sciences Summer Meeting, American Society of Limnology and Oceanography and North American Benthological Society, Sanat Fé, New Mexico, USA.

- Das\*, P., Xenopoulos, M.A., **Williams, C.J.**, and Metcalfe C.D. 2010. Nanosilver effects on natural aquatic microbial communities. SETAC Europe 20<sup>th</sup> Annual Meeting, Seville, Spain.
- Xenopoulos, M.A., Luu, B., Scott, A.B., Spooner, D.E., **Williams, C.J.**, Wilson, H.F., and Evrard, V.E. 2009. The role of land use in mediating denitrification and other stream ecosystem processes. Aquatic Sciences Meeting, American Society of Limnology and Oceanography, Nice, France.
- Williams, C.J.**, Scott, A.B., Wilson, H.F., and Xenopoulos, M.A. 2008. Influence of land use on bacterial activity and organic matter characteristics in southern Ontario Streams. Canadian Conference for Fisheries Research and Society of Canadian Limnology, Ottawa, Ontario, Canada.
- Williams, C.J.**, Jaffé, R., and Jochem, F.J. 2008. Spatial patterns in microbial fatty acid composition and carbon cycling in a seagrass estuary. Ocean Science Meeting, Orlando, Florida, USA.
- Williams, C.J.**, Jaffé, R., and Jochem, F.J. 2007. Tracking carbon sources for heterotrophic bacteria in a subtropical seagrass estuary. Coastal and Estuarine Research Federation, Providence, Rhode Island, USA.
- Williams, C.J.** and Jochem, F.J. 2007. Relative contribution of microbial communities to organic matter cycling in a subtropical seagrass estuary. Aquatic Sciences Meeting, American Society of Limnology and Oceanography, Santa Fé, New Mexico, USA.
- Williams, C.J.**, Boyer, J.N., and Jochem, F.J. 2006. Impacts of hurricane induced freshwater release to pelagic microbial communities in Northeastern Florida Bay. Semiannual meeting, Southeastern Estuarine Research Society, Ponte Vedra Beach, Florida, USA.
- Williams, C.J.**, Lavrentyev, P.J., and Jochem, F.J. 2006. Evidence for top-down and bottom-up control of microbial populations in Florida Bay, USA. Ocean Sciences Meeting, American Society of Limnology and Oceanography with The Oceanography Society and American Geophysical Union, Honolulu, Hawaii, USA.
- Williams, C.J.** and Jochem, F.J. 2006. Ectoenzyme kinetics in Florida Bay: Implications for bacterial carbon source and nutrient status. Annual Biology Symposium, Department of Biological Sciences, Florida International University.
- Williams, C.J.**, Boyer, J.N., and Jochem, F.J. 2005. Serial hurricane impacts in Florida Bay: Implications for aminopeptidase activity and NH<sub>4</sub><sup>+</sup> regeneration. Aquatic Sciences Meeting, American Society of Limnology and Oceanography, Salt Lake City, Utah, USA.
- Williams, C.J.**, Lavrentyev, P.J., and Jochem, F.J. 2005. Microbial grazing impacts on ectoenzyme activity and substrate affinity in Florida Bay. Annual Biology Symposium, Department of Biological Sciences, Florida International University.
- Jochem, F.J. and **Williams, C.J.** 2005. Effects of post-hurricane freshwater imports from the Everglades on bacterial community composition, ectoenzyme activities, and nitrogen cycling in northern Florida Bay. 2005 Florida Bay and Adjacent Marine Systems Science Conference, Duck Key, Florida, USA.

### Academic Service

- Peer Reviewer – Biogeosciences, Canadian Journal of Soil Science; Chemical Geology; Ecosystems; Inland Waters, Journal of Geophysical Research; Limnology and Oceanography; Science of the Total Environment; Wetlands
- Judge – Canada Wide Science Fair (2010)
- President, National Science Foundation (NSF) – Florida Coastal Everglades (FCE) – Long Term Ecological Research (LTER) Student Organization (2007-2008)
- Vice-President, NSF-FCE-LTER Student Organization (2006-2007)

### Society Memberships

- Association for the Sciences of Limnology and Oceanography (ASLO)

### Relevant Work Experience

Northwest Marine Groundfish Observer

July 2001 – December 2002, National Marine Fisheries Service subcontract in association with Alaska Department of Fish and Game and Saltwater Incorporated

## Curriculum Vitae

### Reference Contacts

- (1) John A. Downing, Ph.D.  
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- (6) Wayne S. Gardner, Ph.D.  
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