

January 22, 2013

Present position: Assistant Professor Department of Earth Sciences
Cross-Appointed to Environmental Science
Dalhousie University,
Halifax NS, Canada

1. Academic Credentials:

- B.Sc. • McGill University, 1993, Physical Geography.
- M.Sc. • University of British Columbia, 1997, Physical Geography.
- Ph.D. • Duke University, 2005, Department of Earth and Ocean Sciences, Nicholas School of the Environment and Earth Sciences.
- P.D.F. • Université de Paris VI, UMR 7619 Sisyphe, Hydrologie Appliquée.

2. Employment History:¹

- 2009-present • Assistant Professor, Department of Earth Sciences (primary department as of July 2011) and Environmental Science, Dalhousie University.
- 2008 • Sessional Lecturer, Department of Geography, University of Toronto.
- 2005-2007 • Marie Curie Intra-European Post-Doctoral Fellow, UMR 7619 Sisyphe, Université de Paris VI (Pierre et Marie Curie) Paris, France.
- 2002 • Teaching Assistant, Department of Earth and Ocean Sciences, Nicholas School of the Environment and Earth Sciences, Duke University.
- 2000-2001 • Research Assistant, Department of Earth and Ocean Sciences, Nicholas School of the Environment and Earth Sciences, Duke University.
- 1997-2000 • Geoscientist and Project Manager, Northwest Hydraulic Consultants, North Vancouver, BC.
- 1994-1998 • Forest Hydrology Consultant for BC Ministry of Forests, Research Division, Nanaimo, BC.
- 1995 • Research Assistant, Institute for Resources, Environment and Sustainability, UBC, Vancouver, BC.
- 1991-1993 • NSERC USRA Research Assistant (3x), Department of Geography, UBC, Vancouver.

¹ Note: work interruptions for maternity (2006/2007 and 2008/2009) and compassionate (2009/2010) reasons.

3. Administrative Contributions:

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|---------------------|---|
| Department
Level | <ul style="list-style-type: none"> • Undergraduate Advisor for Environmental Science (approximately 8 hours per week for 8 months in 2012-2013). • Member of the Environmental Science Curriculum Committee (2010-2012). • Served on Sessional Instructor Search Committee for Environmental Science (2010). |
| Faculty
Level | <ul style="list-style-type: none"> • Member of the Department of Oceanography Chair Search Committee (2010-2011). • Member of the Environmental Science Chair Search Committee (2011). • Member of the Environmental Science Advisory Committee (2011-2012). |

4. External Research Funding Obtained Since Appointment at Dalhousie University:

Investigator(s)	Funding Program	Title	Total Amount (CAD)	Dates of Tenure
B. Nodding, S. Sterling	Donner Foundation /Bluenose Coastal Action Foundation	Support to study effectiveness of catchment liming to improve water chemistry in NS	\$30,000	2013
S. Sterling	NS Strategic Cooperative Education Incentive	Water quality analyst salary support (<i>awarded for an undergraduate student to work in my lab</i>)	\$3,754	2013
S. Sterling	CFI Leaders Opportunity Fund	Infrastructure for the Facility for Watershed Chemistry and Hydrology	\$352,000	2012 -
S. Sterling	Environment Canada	Analysis of stream acidification data collected using advanced automated water quality monitoring instrumentation at a stream site in Nova Scotia (NS)	\$12,288	2012-2014
S. Sterling	NSERC	Early Career Researcher Supplement	\$5,000	2012
S. Sterling	NSERC Discovery	Using land surface model experiments to improve understanding of alteration of the global water cycle from land cover and climate change	\$110,000	2011-2016
S. Sterling	NS Environment	The NS Watershed Assessment Project, renewal	\$30,000	2011-2013

S. Sterling	NS Department of Fisheries and Aquaculture	Riparian buffer strategy for NS (<i>awarded to E. Rideout to work in my lab</i>)	\$2,250	2012
S. Sterling	NS Strategic Cooperative Education Incentive	Water quality analyst salary support (<i>awarded for an undergraduate student to work in my lab</i>)	\$3,754	2011
S. Sterling	Environment Canada Science Horizons	Investigating freshwater and coastal buffer policy options for the province of NS (<i>awarded to E. Rideout to work in my lab</i>)	\$12,000	2011-2012
C. Conrad (PI) S. Sterling H. Castleden (Co-Is)	SSHRC Community University Research Alliance	Community-based integrated water monitoring and management in NS	\$994,831	2011-2016
S. Sterling	NS Environment	Riparian setbacks from fresh and coastal waters (<i>awarded to E. Rideout to work in my lab</i>)	\$5,000	2011-2012
S. Sterling	NS Environment	NS Watershed Assessment Project, renewal	\$10,000	2011
S. Sterling	NS Environment	NS Watershed Assessment Project	\$19,500	2010-2011
Pending*				
B. Nodding, S. Sterling, L. Hinks	Environment Canada Atlantic Ecosystem Initiatives /Bluenose Coastal Action Foundation	Catchment Liming within Lunenburg County Watersheds, NS	\$393,000	2013-2016

5. Teaching:

Sole Instructor

ENVS 4901	ENVS Honours Thesis Part A
ENVS 4902	ENVS Honours Thesis Part B
ENVS/ERTH 3601	Global Biogeochemical Cycles

Contributions to

ENVS/BIOL 4001	Environmental Impact Assessment
ERTH 2000	Earth Science Field School
ENVS 3001	Environmental Science Field School

5.1 Program and course development:

Year	Course	Contributions
2012-2013	ENVS/ERTH 3701 Fundamentals of Hydrology	I am currently developing a new course to address a need for an introductory hydrology course in the Faculty of Science; this course is designed to meet a Canadian Council of Professional Geoscientists knowledge requirement.
2010-2011	ENVS Curriculum Development	As a member of Environmental Science Curriculum Committee I worked to design a new curriculum for Environmental Science at Dalhousie.
2009-2010	ENVS/ERTH 3601 Global Biogeochemical Cycles	I developed a new course for students at Dalhousie University on Global Biogeochemical Cycles. This is now a core class for Environmental Science and part of other science programs at Dalhousie.

6. Primary Research Interests:

- Global Hydrology
- Acidified Catchment Hydrology
- Integrated Watershed Management
- Anthropogenic impact on global evapotranspiration and runoff, with particular emphasis on land cover change.
- Freshwater chemistry in acidified environments, effectiveness of mitigation efforts, acidic episodes, nutrient depletion.
- Geospatial indices of watershed health, water chemistry data uncertainty, approaches to manage riparian buffer zones.

7. Supervision of Highly Qualified Personnel:

7.1 Students supervised

Level	Year	Name	Thesis or Project	Notes
PhD	2012-present	Sonja Battia	Fibre-optic measurement of CO ₂	In progress; co-supervised with D. Risk.
MSc	2011-present	Ashley Shelton	Accuracy of water quality monitoring data	In progress; co-supervised with C. Conrad. Received award for runner up for best graduate student presentation at the 2012 National ACAG Conference.
BSc Hons	2013-present	Jeff Minichiello	Calcium depletion in acidified freshwaters and in a limed catchment in Nova Scotia	Currently finishing undergraduate degree.
BSc Hons	2012-present	Maria Armstrong	Modelling recovery from acidification using	Currently finishing co-op undergraduate degree.

			catchment liming.	
BSc Hons	2011-present	Kelly Biagi	Effectiveness of lime in reducing intensity and duration of acid pulses in a headwater catchment in Nova Scotia	Currently finishing co-op undergraduate degree.
BSc Hons	2010-2011	Gillian Fielding	Stream fragmentation from dam construction in Nova Scotia	Received Honorary Mention for best Environmental Science Poster at APICS Conference (March 2011). Starting Master's Degree in September 2012 at Simon Fraser University.
BSc Hons	2009-2010	Emily Rideout	Differential impacts of land use type on riparian forests	Received Dalhousie Governors Award, Owen Hertzman award. Environment Canada Science Horizons Researcher (2011-2012) and Water Resources Intern for Nova Scotia Environment (2010-2011).
NSERC USRA / Co-op	2012	Christine Angelidis	The efficacy of catchment liming to reduce acidic episodes in Nova Scotia	Currently finishing undergraduate degree. Awarded NSERC USRA Award 2012. Recipient of Keith Runcorn Travel Award to present our research together at EGU 2013.
Undergraduate Co-op	2011	Danielle Goodreau	High frequency water chemistry monitoring	Currently finishing undergraduate degree.

7.2 Other Highly Qualified Personnel trained in my research group

Level	Year	Name	Project	Position obtained after leaving my research group
Research Associate	2012-2013	Yue Guan	Nova Scotia Watershed Assessment Project	GIS Technician at Nova Scotia Power
Research Assistant	2012	Hussien Oumer	Global Evapotranspiration Database	Professor at Jimia University, Ethiopia
Research Associate	2010-2011	Peter Horne	Nova Scotia Watershed Assessment Project	GIS Specialist for Nova Scotia Power
Research Assistant	2010	Lyndsay Bozec	Global Evapotranspiration Database	Graduate Student in Audiology

8. Peer-Reviewed Journal Articles (**bold*** indicates personnel from my laboratory)

Sterling, S.M., A. Ducharne, J. Polcher, 2012. Impact of land cover change on the terrestrial water cycle. *Nature Climate Change*, doi: 10.1038/NCLIMATE1690.

Sterling, S.M., and A. Ducharne, 2008, Comprehensive data set of global land cover change for land surface model applications, *Global Biogeochem. Cycles*, 22, GB3017, doi:10.1029/2007GB002959.

Sterling, S.M., O. Slaymaker, 2007. Lithologic Controls over Debris Torrent Sediment Flux in Supply Limited Basins. *Geomorphology* 86 (3-4), 307-309.

Sterling, S.M., M. Church, 2002. Sediment trapping characteristics of a pit trap and the Helley-Smith sampler in a cobble gravel bed river. *Water Resources Research*, 38 (8), 11 p.

Rojstaczer, S., **S.M. Sterling**, and N. Moore, 2001. Human appropriation of photosynthesis products. *Science*, 294, pp. 2549-2552.

8.3 Manuscripts in preparation

Rideout, E.,* S.M. Sterling. Level of deforestation in riparian zones varies with land use type. To be submitted to *Journal of Applied Ecology*.

Goulden, T., Hopkinson, C., Jamieson, R., **Sterling, S.**, Sensitivity of watershed attributes to spatial resolution and interpolation method of LiDAR DEMs in three distinct landscapes. To be submitted to the *Journal of the American Water Resources Association (JAWRA)*.

Goulden, T., Jamieson, R., Hopkinson, C., **Sterling, S.**, Sensitivity of hydrological outputs from SWAT to DEM spatial resolution. To be submitted to *Hydrological Processes*.

Rideout, E.,* S.M. Sterling, J. Huston, K. Hilchey, Aquatic Setbacks and Buffers: a new framework for policy adoption. To be submitted to the *Journal of the American Water Resources Association*.

Fielding, G.*, Horne, P.*, Guan, Y.*, S. Sterling. Evolution of stream fragmentation from 1800 to 2010 in Nova Scotia. To be submitted to *Canadian Journal of Fisheries and Aquatic Science*.

S. Sterling, P. Horne*, P., G. Fielding*, K. Garroway, G. Kennedy. Integrated Geospatial Assessments as a Policy Tool – the case of the Nova Scotia Watershed Assessment Program. To be submitted to *Journal of Environmental Management*.

8.4 Non-reviewed contributions

Garroway, K., **S. Sterling, Horne*, P., G. Fielding***, G. Kennedy, 2012. Nova Scotia Watershed Assessment Program: Part A – Discussion Paper, Nova Scotia Environment, June 12, 2012.

Rideout, E.,* S.M. Sterling, J. Huston, K. Hilchey, 2012, *Setbacks & Vegetated Buffers in Nova Scotia: A review and analysis of current practices and management options*, a project supported by Nova Scotia Environment, and Nova Scotia Fisheries and Aquaculture, with additional funding from the Environment Canada Science Horizons Program.

Between 1997 and 2000 I wrote ten technical reports for Northwest Hydraulic Consultants on Hydrology

and Geomorphology Studies of watersheds in British Columbia.

9. Invited Lectures and Other Presentations

9.1 Invited lectures

- 2012 **Sterling, S.M.**, 2012. Relative forcing of anthropogenic alterations to the global water cycle. Acadia University, January 23, 2012
- 2011 **Sterling, S.M.**, 2011. Human alteration of the Global Water Cycle through Land Cover Change and Implications for Climate. NSERC CREATE workshop in Climate Science invited Speaker at Saint Francis Xavier University, June 20, 2011.
- 2010 **Sterling, S.M.**, 2010. Human alteration of the global water cycle through land cover change. Department of Oceanography, Dalhousie University, May 21, 2010.
- Sterling, S.M.**, 2010. Human alteration of the global water cycle through land cover change. Department of Atmospheric Science, Dalhousie University, June 2, 2010.
- Sterling, S.M.** 2010. The impact of Land Cover Change on the Global Water Cycle. University of Victoria, School of Earth and Ocean Sciences. March, 2010 (did not deliver due to compassionate leave).
- 2007 **Sterling, S.M.**, 2007. A comprehensive land cover mapping dataset for Land Surface Model studies. Department of Geography, McGill University, Montreal, PQ, March 9, 2007 (did not deliver due to death in family).
- Sterling, S.M.**, 2007. How global land cover change impacts the water system. Department of Geography, Cambridge University, Cambridge, UK, January, 18, 2007

9.2 Invited presentations at conferences or workshops of work produced at Dalhousie

- 2012 **Sterling, S.M.**, 2012 (invited). The Nova Scotia Watershed Assessment Project. SSHRC Integrated Water Innovation Forum. University of Alberta, August 9, 2012.
- Shelton, A.*, S.M. Sterling, C. Conrad**, 2012 (invited). Can citizen-science water quality data be used to inform policy decisions? SSHRC Integrated Water Innovation Forum. University of Alberta, August 9, 2012.
- Garroway, K., **S.M. Sterling, P. Horne***, G. Kennedy, 2012 (invited). The Nova Scotia Watershed Assessment Project. Canadian Water Resources Association Symposium on Freshwater management in Atlantic Watersheds and Municipalities, University of Moncton, NB, February 3rd, 2012.
- Sterling, S.M., Horne*, P., G. Fielding***, Garroway, K., G. Kennedy, 2012 (invited). Nova Scotia Watershed Assessment Program: 2nd Atlantic Canada Water Symposium and Planning Forum. March 23 2012, NSAC, Truro, NS, (delivered by K. Garroway).

9.3 Contributed conference and workshop presentations from work produced at Dalhousie

- 2012 **Biagi, K.*, Sterling, S., Angelidis, C.*, T. Clair, A. Breen,** 2012. Remote assessment of instantaneous changes in water chemistry following liming in an acidified Nova Scotia Catchment. Oral presentation. First Annual Scientific Conference, Mersey Tobiatric Research Institute. November 2, 2012. Kejimkujik Park, Nova Scotia.
- Shelton, A.*, Conrad, C.*, Sterling, S.,** 2012. A comparative study: water quality monitoring data credibility of citizen scientists and professionals. Meeting of the Atlantic Division of the Canadian Association of Geographers (ACAG), Saint Mary's University, October 19-21, 2012. Halifax, NS. *Received ACAG Presentation award.*
- Sterling, S.M., K. Biagi*, C. Angelidis*,** A. Breen, T.A. Clair, 2012. Remote assessment of instantaneous changes in water chemistry after liming a Nova Scotia catchment. BIOGEMON 2012: The 7th International Symposium on Ecosystem Behavior. July 15-20, 2012, Penobscot Bay, Maine USA.
- Garroway, K., **S. Sterling, Horne*, P., G. Fielding*,** G. Kennedy, 2012. Nova Scotia Watershed Assessment Program: Part A. Canadian Water Resources Association Mid-Term Meeting Workshop on Fresh water management in Atlantic watersheds and municipalities. Friday February 3rd, 2012, Universite de Moncton, New Brunswick, Canada.
- 2011 **S. Sterling, Horne*, P., G. Fielding*,** K. Garroway, G. Kennedy, 2011. Nova Scotia Watershed Assessment Program: Results of the Preliminary Assessment. CWRA National Conference "Our Water – Our Life", June 27-30, 2011, St. John's Newfoundland, Canada.
- S. Sterling, Fielding, G*, P. Horne*,** 2011. Evolution of length of streams accessible for fish habitat in Nova Scotia: changes due to dam construction from 1800 to 2010. Canadian Water Resources Association National Conference "Our Water – Our Life", June 27-30, 2011, St. John's Newfoundland, Canada.
- Fielding, G*, S. Sterling, P. Horne*,** 2011. Evolution of length of streams accessible for fish habitat in Nova Scotia: changes due to dam construction from 1800 to 2010. Atlantic Provinces Council on the Sciences (APICS) Joint Aquaculture and Fisheries, Biology and Environmental Science Conference. March 11-13, 2011, Halifax, Nova Scotia, Canada (Honorable mention for best Environmental Science poster).
- 2010 **Rideout, E.*, S. Sterling,** 2010. Riparian buffer removal and associated land used drivers in the Sackville River Watershed. Atlantic Agricultural Riparian Health Workshop. Moncton NB, September 29-30th, 2010.
- Rideout, E.*, S. Sterling,** 2010. Riparian Buffer Removal and Associated Land Use in the Sackville River Watershed, Nova Scotia, Canada. Atlantic Provinces Council on the Sciences. APICS March, 2010.

10. Service to Academic Community

10.1 Service on graduate student committees:

Saad Mohammed, PhD Thesis Reader and Defense Examiner, 2012-2013 (Dalhousie University, Department of Earth Sciences, D. Scott, supervisor).

Patrick Longobardi, MSc External Reviewer, 2012 (St. FX, Dept of Earth Sciences).

Tristan Goulden, PhD Committee Member, 2010 - present (Dalhousie, Faculty of Engineering, R. Jamieson, supervisor).

Jennifer Frail-Gautier, PhD Committee Member, 2010 - present (Dalhousie, Faculty of Science, D. Scott, supervisor).

Tim Bachiu, MSc Thesis Reader, 2010 (Dalhousie, Department of Earth Sciences, AM Ryan and T Clair supervisors).

10.2 Peer review

Reviewer for NSERC Discovery Grant Applications (Dec 2011, Dec 2012).

Reviewer for *Journal of Environmental Management* (2009, 2011, 2012).

10.3 Other service to academic community

Organizer and Host of Kejimikujik Ecohydrology Workshop, April 2011, Dalhousie University.

Session Chair, Water Quality Monitoring, Canadian Water Resources Association National Conference, St. John's Newfoundland, June 27-20, 2011.

Served on SSHRC CURA H2O research committee (2011-2012).

10.4 Affiliations

Member, European Geophysical Union

Member, American Geophysical Union

Member, Canadian Geophysical Union

11. Outreach and Community Service

11.1 Community service

- May 22-25, 2012

 - Served as invited scientist for the Recovery Potential Assessment for the Southern Uplands Atlantic Salmon to inform decisions about recovery planning as required under the Species at Risk Act (SARA). My role was to provide science-based advice on current status, impact of human activities on the potential for recovery, and options to mitigate human threats to achieve recovery objectives for the salmon.

- June 12, 2012

 - Co-produced report: *Nova Scotia Watershed Assessment Program: Part A – Discussion Paper*, to Nova Scotia Environment, June 12, 2012.

- May, 2012

 - Produced and released a scientific policy report for the Nova Scotia Government: *Setbacks & Vegetated Buffers in Nova Scotia: A review and analysis of current practices and management options*, a project supported by Nova Scotia Environment, and Nova Scotia Fisheries and Aquaculture, with additional funding from the Environment Canada Science Horizons Program.

- October 4, 2011

Advised on climate change issues for Dept of Foreign Affairs to help prepare the Canadian delegation for the RIO+20 Earth Summit 2012.

- September, 2011

 - Advised the Deputy Minister of Environment, Nova Scotia (S.J. Snook) on watershed issues in Cape Breton

- July 25, 2011

 - Presented research on the Nova Scotia Watershed Assessment Project to the Deputy Minister of Environment, Nova Scotia (S.J. Snook) and the Water Resources Branch at Nova Scotia Environment.

- July 2009 - July 2010

 - Advised the Provincial Government (Nova Scotia Environment) on the Nova Scotia Water Strategy, particularly related to scientific needs required to implement the strategy.

11.2 Media coverage of my research

Date	Venue	Title	Featured Research
November 23, 2012	<i>CBC 6 pm Evening News, Nova Scotia</i>	“Acid Rain”	Catchment liming experiment (S. Sterling, PI)
November 23, 2012	<i>CBC Radio “Mainstreet” and “Information Morning”, Nova Scotia</i>	“Acid Rain”	Catchment liming experiment (S. Sterling, PI)
November 23, 2012	<i>CBC News website story</i>	“New culprit identified in chronic acid rain problem”	Catchment liming experiment (S. Sterling, PI) http://www.cbc.ca/news/canada/nova-scotia/story/2012/11/22/ns-acid-rain.html

June 25, 2012	<i>Water Canada: The complete water magazine</i>	"Report: Watershed Health in Nova Scotia"	Nova Scotia Watershed Assessment Project (S. Sterling, PI)
June 5, 2012	<i>CBC Information Morning, Halifax NS</i>	Delivered a live studio interview for "A new liming project on the South Shore"	Catchment liming experiment (S. Sterling, PI) (http://www.cbc.ca/informationmornings/2012/06/05/a-new-liming-project-on-the-south-shore/)
December 17, 2010	<i>Dal News</i>	"Assessing the health of watersheds"	Nova Scotia Watershed Assessment Project (S. Sterling, PI)
December 16, 2010	<i>CBC News, Nova Scotia</i>	"N.S. water strategy focused on conservation, protection"	Nova Scotia Watershed Assessment Project (S. Sterling, PI)

11.3 Outreach

January 3, 2013	<ul style="list-style-type: none"> Invited speaker at the Sackville Rivers Association. Title: "The efficacy of catchment liming to reduce chronic acidification impacts."
May 31, 2012	<ul style="list-style-type: none"> Field visit and lecture on water chemistry monitoring and acidification of freshwaters to New Germany Rural High School students, class of Hester Gibson.
March 23, 2012	<ul style="list-style-type: none"> Invited plenary speaker for the Annual General Meeting of the Registered Professional Foresters Association of Nova Scotia (RFPANS) to speak on The Nova Scotia Watershed Assessment Project. Truro, Nova Scotia, March 23, 2012 (delivered by K. Garroway).
December 12, 2011	<ul style="list-style-type: none"> Invited presenter with research associate, E. Rideout, to a joint meeting of the Nova Scotia Water Strategy Implementation Committee and the Provincial Oceans Network. We presented our research on setbacks and buffers in riparian and coastal zones: current status and future recommendations for Nova Scotia.
April 30, 2011	<ul style="list-style-type: none"> Contributed a featured project for "Community Group Workshop" hosted by NSLC Adopt a Stream and the Nova Scotia Salmon Association.
August, 2010	<ul style="list-style-type: none"> Delivered an invited presentation to the Annual Meeting of the Sackville Rivers Association on "Land Use Drivers of Riparian Forest Removal", with my Honours student, Emily Rideout.

12. Honours and Awards

- 2011 Elected Best Environmental Science Professor for 2010/2011 by Dalhousie University Environmental Science students.
- 2007 Environment Canada / NSERC Visiting Fellowship to Government Laboratories (\$45,000 CAD/yr – did not accept).
- 2005 Marie Curie Intra-European Post-Doctoral Fellow Award (180,000 Euros).
- 2004 Government of France – Embassy of the United States Chateaubriand Fellowship Award (25,000 Euros).
- 2001-2005 Graduate Student Award, Duke University (\$120,000 USD).
- 2003-2004 Duke Graduate School Award for International Research (\$5,000 USD).
- 1993-1995 NSERC Post-Graduate Scholarship (~\$36,000 CAD).
- 1993-1995 Forestry Canada Award (\$5,000 CAD/yr).
- 1991-1993 NSERC USRA Award (~\$4,000 CAD/yr).