



ANNE MARIE (O'BEIRNE) RYAN

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Cross-Appointment: Environmental Programs
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RESEARCH INTERESTS

My research interests are 2-fold:

- (1) Environmental geoscience – mostly undertaken with undergraduate students. Metals in soils in the urban environment, and uranium (and other metal) mobility in the natural environment
- (2) Education-related research:
 - Teaching geoscience at the intersection of geology and society
 - Geoethics
 - Threshold Concepts across the sciences, and within the geosciences, and at the intersection of the affective domain
 - Critical and creative thinking in the earth and environmental sciences
 - Visual literacy and geo-cognition
 - Teaching communities in science: development and sustainability

EDUCATION

PhD. (Earth Sciences) Dalhousie University, Nova Scotia
MEd (Literacy Education) Mount Saint Vincent University, Nova Scotia
BEd (Secondary Education) Acadia University, Nova Scotia
MSc (Geology) Acadia University, Nova Scotia
BSc (Geology, Chemistry, Maths) UCD (University College Dublin), Ireland

EMPLOYMENT HISTORY

University Teaching Fellow, Earth Sciences, Dalhousie University (2016-present)

Senior Instructor, Earth Sciences, Dalhousie University (2006-16)

Instructor, Earth, Sciences, Dalhousie University (2001-2006)

Part-Time Instructor, Earth Sciences, Dalhousie University (1997-2001)

Part-Time Instructor, Geology, Saint Mary's University (1992-1999)

Teacher (50%) Grade 4, Duc D'Anville, Halifax (1993-94)

COURSES TAUGHT

Leadership in science (SCIE 4444): co-developer and co-instructor since 2014

Geology I and II (ERTH 1080 / 1090): Introductory earth sciences courses

Environmental Issues in Earth Sciences (ERTH/ENVS 2410) second year elective course

Environmental Geoscience (ERTH 4410): capstone course in environmental geosciences

New course (2019-20): **Science Teaching: Principles and practice** (SCIE 3333)

Previously taught: 2nd Year geochemistry; sediments and sedimentary rocks. 1st year Intro to physical geography

Co-coordinator: Leadership and Communication Certificate in Science

Developer and Leader, community of teaching practice in science (CoPSci)

AWARDS AND GRANTS

AWARDS

3M National Teaching Fellow 2019

Anne Marie McKinnon Educational Leadership Award, Association of Atlantic Universities 2017

Dalhousie Alumni Teaching Award, Dalhousie University 2016

Faculty of Science, Dalhousie Award for Excellence in Teaching 2015

Dalhousie University Educational Leadership Award 2014

GRANTS

2018: Academic Innovation Fund, Dalhousie University (\$2000) – First year in-class undergraduate research

2018: Centre for Learning and Teaching Enhancement Grant, Dalhousie University – development of innovative course on Science Education (\$2974)

2018: Canadian Geologic Foundation (\$1000) – development and presentation of workshop in teaching “Geoscience and Society”, GAC-MAC conference, 2019

2015, 14, 11: Centre for Learning and Teaching, Dalhousie University – Travel Grant to education conferences in recognition of contributions to teaching and learning

2013: PI and co-recipient, Innovation Fund, Dalhousie University – development of service learning course on Science Leadership

2008-2010: Environment Canada (33,760) – support for graduate student “Understanding the role of seaspray in regulating the chemistry of coastal surface waters (Cl isotopes)

STUDENT RESEARCH SUPERVISION (2004-PRESENT)

PhD Thesis

Gabriel, Carrie-Ellen (current) Supervisory Committee Member. Thesis: Examining the destabilization of soil organic matter in podzols in response to forest harvesting

Frail-Gauthier, Jennifer (defended, January 2018). Supervisory Committee Member, Ecological interactions and geological implications of foraminifera and associated meiofauna in temperate salt marshes in Eastern Canada.

Simon, Sharane (graduated, 2016) Supervisory Committee Member. Thesis: Sedimentology of the fluvial systems of the Clear Fork Formation in north-central Texas: implications for Early Permian palaeoclimate and plant fossil taphonomy

Masters Thesis

Tobey, Dawn (current) Supervisory Committee, Earth Sciences (sedimentology) Dalhousie University

Letman, Meggie (defended, 2016) Supervisory Committee, Applied Science, Dalhousie University

Finlayson-Bourque, Danielle (defended, December 2014). Supervisory Committee, Applied Science

O'Brien, Kelsey (defended, Fall 2013) Supervisory Committee Member. Thesis: Radon Soil Gas within Halifax Regional Municipality, Nova Scotia

Bachiu, Timothy (defended, Fall 2010) (Co-supervised with Dr. Tom Clair, Environment Canada) Investigating Sources of Stream Chloride near Kejimikujik National Park, Southwestern Nova Scotia: A Chlorine Stable Isotope Approach

Honours Thesis

Henderson, Fiona (2016-17). Predicting potential anthropogenic influences and evaluating metal concentrations within urban soils, Halifax, Nova Scotia.

Malcolm, Camille(2015-16). Igneous clasts as clues to provenance and age of the Cumberland Group conglomerate, Nova Scotia

Blume, Oliver (2015-16). Uranium solubility as a result of the addition of a variety of ionic species.

Desjardins, Victoria (2015).Metals in Urban Soils: the potential impact of chlorine on mobility of heavy metals in Halifax, Nova Scotia.

Pothier,Haley (2009). Potential of Uranium Mobility in a Sandstone Aquifer in the Bridgetown Area, Nova Scotia

Finlayson, Danielle (2008). Potential for the Presence of Radon in Water from Weathered Outcrops of Uranium-Bearing Strata of Southern Nova Scotia

Jaggard, Heather (2007). Establishing potential for leaching of Hg and As from soils in the Montague Gold District, Nova Scotia.

Parsons, Andrea (2007). Potential for Uranium Mobilization from Weathered Outcrops of Uranium-Bearing Sedimentary Strata, Southern Nova Scotia

Little, Megan (2006) (co-supervised with Dr.Michael Parsons,NRCAN) Distribution of Arsenic and Mercury in Terrestrial and Marine Environments Impacted by Gold Mine Tailings, Wine Harbour, Nova Scotia

Estrop, Cynthia (2005) (co-supervised Research Project with Dr. Mark King, Hydrogeologist) Consideration of Long Term Groundwater Monitoring at Wood Treating Sites

Arnold, Jennifer (2004) (co-supervised with Dr.Steve Armstrong, Microbiologist) Geomicrobiological analysis of acid generating rock of the Meguma group pertaining to disposal in the Bedford Basin, Nova Scotia

INVITED LECTURES / PRESENTATIONS

Teaching Geoscience and Society. Invited workshop, GAC-MAC-IAH Quebec City, May 2019

Field Trip Lead, EdGeo workshop, Halifax and environs, October 2017

Opening Doors to Student Learning. Invited presenter, Canadian College and University Environmental Network: May 2016 Conference, Dalhousie University: Theme–The Environment and Sustainability Across the Campus and the Curriculum.

Teaching and Learning Geoscience in the 21st Century. Atlantic Geoscience Society Invited Presenter, Truro, February 2016

Introducing Threshold Concepts: Students uncertainty and the Process of Learning, Teaching, and Assessment. Invited Workshop Co-presenter - 6th Biennial Threshold Concepts Conference, Dalhousie University, June 2016. Our Students at the Edge. Invited panelist, 6th Biennial Threshold Concepts Conference, Dalhousie University, June 2016.

Ethics in Geoscience: Our Integrity is at Stake. Invited presenter: Atlantic Geoscience Society Special Education Session (Jan 2015)

(Geo)Ethics. Invited co-speaker, Situating Science Series, Kings-Dalhousie, Winter 2014.

New Certificate Program in Science (leadership and communication). Invited speaker, Situating Science Series, Kings Dalhousie, Winter 2014.

Working Together. Invited co-speaker, Situating Science Series, Kings-Dalhousie, Winter 2014.

Critical Thinking and Disciplinary Thinking. Invited presentation for Teaching and Learning Institute – Professional Enrichment Program for the King Saud University (at Dalhousie University). (July 2014)

Geoethics in Canada (and workshop participant). Workshop on Teaching Geoethics, Montana, US. (June 2014)

Geoethics Case Study – Urban Geology Issues (and workshop participant). Workshop on Teaching Geoethics, Montana, US (June 2014)

You really do make a difference. Invited workshop/presentation for Teaching Assistant Days, Dalhousie, Fall 2013

Urban Geology and the Environment. Invited Field Trip leader, Environmental Studies, St Mary's U, July 2013 Blended Learning.

Invited workshop / presentation, Agricultural College, Truro, Nova Scotia (Mar 2012) and also Centre for Learning and Teaching, Dalhousie University, Studley Campus (Winter 2012)

Geoscience Professional Development 2-day workshop for Educators. EdGeo Workshop, Bedford Institute of Oceanography, in conjunction with Atlantic Geoscience Society Education Committee, invited co-developer and presenter. (Aug 2011)

Who Dun it? Engagement and problem-solving through forensic approaches. University of British Columbia, Earth Sciences Department (Dec 2010): Invited Lecture

Evolution: Integrating the geological and biological sciences. Invited panel member, Atlantic Geoscience Society Annual Symposium, Wolfville, NS. (Feb 2010)

The Fine Art of Questioning. Invited presentation for the Graduate Certificate in Undergraduate Teaching and Learning, Dalhousie University, Feb. 2010, 2012-17

Undergraduate research (co-presenter, with Jennifer MacDonald) Invited workshop session Centre for Learning and Teaching Dalhousie University, Nov 2009

Making Science Real. St. Francis Xavier University, Biology Department (Mar 2009): Invited Lecture

St. Mary's University (approx. annually): Environmental Science Seminar – topics in Environmental Geology

The What, Where, Why, How... of Radon, in: Short Course on. Uranium Geochemistry: Drinking Water, Environment, Exploration and Mining. Society of Economic Geologists Student Chapter, St. Mary's University-Dalhousie University, 2007

"Scientists must write". Invited lecture for First year writing course (Lynn Bennett), Dalhousie University, Fall 2011 Dalhousie University, Planning Program (Winter2014andWinter2011). Invited presenter for two sessions in Geology and Planning course as well as co-leading a related field trip

Dalhousie University, College of Sustainability (Winter 2012-14 and 2017). Invited presenter (Mining and Sustainability; Geology, Cities, and Sustainability)

The Land Beneath our Feet: Canada's Physical Inheritance. Dalhousie University, Canadian Studies Program (Winter 2009), Invited presenter

PUBLICATIONS – TEACHING AND LEARNING

Peer-Reviewed

Ryan, A.M. and Gass, S. 2019 (under review). Book chapter on Simulations in the Earth and Environmental Sciences classroom

Murray, S., Ryan, A.M., and Wuetherick, B. (in press, 2019) Exploring Threshold Concepts on the Edge: Learning, Teaching and Assessment Practices. In: Threshold Concepts on the Edge. Eds. J.A. Timmermans and R. Land

Ryan, A.M. et al., 2017. Conversations in a coffee shop: voices from the trenches of a community of teaching practice of university science faculty. Transformative dialogues, Teaching and Learning Journal 9(3), January 2017.

Ryan, A.M. and Gass, S. 2016. Quantitative Reasoning: Crossing Thresholds. In: Discussions on Science Teaching, Western Science Education Conference Proceedings, Volume 1, 2016.

Ryan, A.M., 2014. Authentic Assessment: take a hike, take a photo, create a visual guide. Atlantic Universities Teaching Showcase Proceedings, 2014.

Ryan, A.M.,2014. Seeing Deeply in Space and Time: interdisciplinarity meets threshold concepts in earth and environmental sciences. In: Threshold Concepts: from personal practice to communities of practice. Proceedings of the National Academy's Sixth Annual Conference and the Fourth Biennial Threshold Concepts Conference 2013. ISBN: 978-1-906642-58-7

Bank, C.-G. and Ryan, A.M., 2009. Real problems, Real Research, Real Students: Authentic Research with Undergrads as a Win-Win-Win Collaboration. CELT, Volume 2, p.180-186.

O'Beirne-Ryan, A.M.,2008. Who Dun It? Engagement and Problem-Solving Through Forensic Techniques. Extended abstract, in: AAU conference proceedings, 2008.

O'Beirne-Ryan, A.M., 2008. Question me an Answer: Re-awakening the Art of Inquiry in Post-Secondary Science Education. CELT, Volume 1, p. 66-70.

Additional Publications: Teaching and Learning

Ryan, A.M., 2018. Thinking through images: the varied roles of visuals in undergraduate learning in the Earth sciences and beyond. *New Perspectives in Science Education (7th)*, Conference Proceedings (extended abstract).

Sheffield, S. Le-May and Ryan, A.M., 2014. A Framework for Creativity Through Dialogu ein Higher Education. *International Society of Scholarship of Teaching and Learning (ISSOTL) –Supplement for: Conference Poster*, Quebec City, QC, October 2014.

Ryan, A.M., Gass, G., Ryan, K., Gass, S., and Van Dommelen, J., 2013. Identification and Significance of "Hidden" Threshold Concepts for the First Year Learning Environment. Supplement for: Presentation at -21st International First Year Experience Conference, Hawaii, 2013.

Ryan, A.M., 2010. "I think I can, I think I can...I knew I could!" A tale of an undergraduate learning adventure (Undergraduate Research). In: *Focus on University Teaching and Learning*, Dalhousie University, 2010: Vol. 18, No.3.

Ryan, A.M., 2008. From Mine Field to Mind Field: Making our assessments matter. In: *Focus on University Teaching and Learning*, Dalhousie University, 2008: Vol, 16, No.1.

Ryan, A.M. and Tae, K., 2004-05. Learning to question: questioning to learn. In: *Focus on University Teaching and Learning*, Dalhousie University. 2004-05, Vol.

Publications – Geoscience

Peer-Reviewed Ryan, A.M. and Bank, C.-G., 2017. The Need for Geoethics Awareness from a Canadian Perspective. *Geosciences (Switzerland)*, 7(4): 120

O'Brien, K.E., Risk, D., Rainham, D., and O'Beirne-Ryan, A.M., 2014. Using field analogue soil column experiments to quantify radon-222 gas migration and transport through soils and bedrock of Halifax,

Nova Scotia, Canada. *Environmental Earth Sciences*, 72: 2607-2620.

Ryan R.J. and O'Beirne-Ryan, A.M., 2009. Uranium occurrences in the Horton Group of the Windsor area, Nova Scotia and the environmental implications for the Maritimes Basin. *Atlantic Geology*, 45: 171 – 190.

O'Beirne-Ryan, A.M. and Zentilli, M., 2006. Weathering of Devonian monzogranites as recorded in the geochemistry of saprolites from the South Mountain Batholith, Nova Scotia, Canada. *Atlantic Geology*, 42: 151-157.

Ryan, R.J., O'Beirne-Ryan, A.M., and Zentilli, M., 2005. Rounded cobbles that have not travelled far: incorporation of corestones from saprolites in the South Mountain area of southern Nova Scotia, Canada. *Sedimentology*, 52: 1109-1121.

O'Beirne-Ryan, A.M. and Zentilli, M., 2003. Paleoweathered surfaces on granitoids of southern Nova Scotia: paleoenvironmental implications of saprolites. *Canadian Journal of Earth Sciences*, 40: 805-817.

Feetham, M., Ryan, R.J., Pe-Piper, G., and O'Beirne-Ryan, A.M., 1997. Lithogeochemical characterization of the Beaverbank unit of the Halifax Formation, Meguma Group, and acid drainage implications.

Atlantic Geology, 33: 133-141.

Jamieson, R.A. and O'Beirne-Ryan, A.M., 1991. Decompression-induced growth of albite porphyroblasts, Fleur de Lys Supergroup, western Newfoundland. *Journal of Metamorphic Geology*, 9: 433-439.

O'Beirne-Ryan, A.M., Jamieson, R.A., and Gagnon, Y.D., 1990. Petrology of garnet-clinopyroxene amphibolites from Mont Albert, Gaspé, Quebec. *Canadian Journal of Earth Sciences*, 27: 72-86.

Conference Presentations: Teaching and Learning (Peer-Reviewed)

Ryan, A.M., 2018. Thinking through images: the varied roles of visuals in undergraduate learning in the Earth sciences and beyond. *New Perspectives in Science Education (7th)*, Florence, March 2018.

Gass, S. and Ryan, A.M., 2017. Diversity and not Dilution: Enriching undergraduate science education through internationalising the curriculum. *Western Conference for Science Education*, London, Ontario.

Ryan, A.M. and Bank, C.-G., 2017. When science meets the real world in 2017: exploring the ethical dimension in our classrooms. *Western Conference for Science education*, London, Ontario.

Ryan, A.M. and Schmidt, A., 2016. Beyond Content: developing the skills and attributes for the 21st Century Graduates. Co-presenter at DCUTL (Dalhousie Conference on University Teaching and Learning) May 2016.

Ryan, A.M., and Schmidt, A., 2015. Ready, Set Lead! How and when to incorporate aspects of leadership into science courses (workshop: *Western Conference on Science Education*, London, Ontario, July 2015) <http://www.thewesternconference.ca/>

Ryan, A.M., and Gass, S., 2015. Quantitative reasoning: crossing thresholds (workshop, *Western Conference on Science Education*, London, Ontario, July 2015) <http://www.thewesternconference.ca/>

Ryan, A.M., Bank, G-C., Pappas-Maenz, C., and Cronin, V., 2015. Teaching Geoethics in Undergraduate Science Programs (workshop). *Joint Assembly*, Montreal, May 2015. <http://ja.agu.org/2015/workshops/>

Ryan, A.M., and Bank, G-C., 2015. Teaching (earth sciences) undergraduate students in the 21st century. (workshop), *Joint Assembly*, Montreal, May 2015. <http://ja.agu.org/2015/workshops/>

Ryan, A.M., and Schmidt, A., 2015. Building community and academic mentoring in the Faculty of Science: a mentorship practicum for senior students in Science Leadership. *Dalhousie Conference on Undergraduate Teaching and Learning*, April 2015. <http://www.dal.ca/dept/clt/events-news/DCUTL.html>

Ryan, A.M. and Sheffield, S.L., 2014. A Framework for Creativity through Dialogue in Higher Education. (poster) – International Society for the Scholarship of Teaching and Learning, Fall 2014, Quebec City. https://www.issotl14.ulaval.ca/files/contnt/sites/issotl14/files/Brochure_complete_Web.pdf

Ryan, A.M., Gass, G., Gass, S., Ryan, K., and Van Dommelen, J., 2014. Quantitative reasoning and Visualizing Data

across the Sciences. 5th Biennial Threshold Concepts Conference, July 2014, Durham, UK.

<https://www.dur.ac.uk/education/cap/conferences/thresholds2014/>

Ryan, A.M., 2013. Authentic Assessment: Take a Hike, Take a Photo, Craft a Crystal, Build a Brochure. Atlantic Universities Teaching Showcase, Mount Allison University, 2013 http://www.mta.ca/aaushowcase2013/PROGRAM_final.pdf

Ryan, A.M., Gass, G., Ryan, K., and Gass, S., 2013. More juggling with less struggling: troublesome concepts ACROSS the sciences. Workshop, Western Science Education Conference, London, Ontario, July 2013. www.ir.lib.uwo.ca/wcse/WCSEThirteen/july09/

Ryan, A.M., 2013. More Activity with Less Passivity: Take three ideas, blend, and flip! Sustainability, earth sciences, and critical thinking. Western Science Education Conference, London, Ontario, July 2013. www.ir.lib.uwo.ca/wcse/WCSEThirteen/july09/

Ryan, A.M., Gass, G., Ryan, K., Gass, S., and Van Dommelen, J., 2013. Identification and Significance of “hidden” threshold concepts for the First-Year Learning Environment. 26th International First Year Experience Conference, Hawaii, June 2013. <http://www.sc.edu/fye/events/presentation/international/2013/2013InternationalPresentationSummaries.pdf>

Ryan, A.M., 2012. Seeing Deeply in Space and Time: interdisciplinarity meets threshold concepts in earth and environmental sciences. 4th Biennial Threshold Concepts Conference, Dublin, Ireland. June 2012. http://www.nairtl.ie/documents/BookofAbstracts_ONLINE.pdf

Sheffield, S., and Ryan, A.M., 2012. Realizing our Creativity through Open Conversations. Dalhousie Conference on Teaching and Learning, May 2012.

O’Beirne-Ryan, A.M., 2011. Developing research skills in the undergraduate years for all students: A tale from two continents. GAC-MAC Joint Annual Meeting, Ottawa, May 2011 (Program with Abstracts, 2011)

O’Beirne-Ryan, A.M., 2011. WORKSHOP - Seeing with new eyes: Developing visual literacy in the sciences. Western Conference on Science Education, Western University, London, Ontario. July 2011.

O’Beirne-Ryan, A.M., 2011. Presentation - When the question is the answer: Proposed developmental model for questioning in the undergraduate years. Western Conference on Science Education, Western University, London, Ontario. July 2011.

Ryan, A.M., 2010. Exploring the 3 "Es" of Education: Enjoyment, enrichment, and engagement. Dalhousie University Conference on Teaching and Learning, Dalhousie University, Halifax.

Taylor, L., Znajda, S., and Ryan, A.M., 2009. Adventures in the Inter-Tidal Zone: Experiences from the Course Design and Teaching Workshop at Dalhousie University, 2009. Society for Teaching and Learning in Higher Education Annual Conference, Fredericton, New Brunswick, June 2009.

O'Beirne-Ryan, A.M., 2009. "Who dun it?" Engagement and Problem-Solving in the Earth Sciences Through Forensic Approaches. European Geoscience Union General Assembly, Vienna, April 2009.

Ryan, A.M., 2008. Who dun it? Engagement and problem-solving through forensic approaches. Atlantic Universities Teaching Showcase, St. John, NB.

Ryan, A.M., 2008. Energizing Engagement and Learning through Emerging Global Issues. STLHE Annual conference, Windsor, Ontario.

Bank, C.-J., and Ryan, A.M., 2008. Real problems, real research, real students: authentic research with undergraduates as a win-win-win collaboration. STLHE Annual Conference, Windsor, Ontario.

Ryan, A.M., 2007. Questions, questions, and more questions: in science and beyond. STLHE Annual conference, Edmonton, Alberta.

Ryan, A.M., 2005. Connecting the Dots and Thinking Outside the Box. Dalhousie University Conference on Teaching and Learning.

Ryan, A.M., 2003. Bridging the Gap: the Transition from High School the First Year University. Dalhousie University Conference on Teaching and Learning.

Recent Published Abstracts and Geology Conference presentations *students I have supervised

Ryan, A.M. and Bank, C.G., 2015. Connecting pedagogy to geology and ethics. Joint Assembly, Montreal, Program with Abstracts, May 2015. Cronin, V., Ryan, A.M., De Capua, G., McHugh, N., Pakinkas, C.M., Pappas-Maenz, C., Peppoloni, S., 2015. Seeking community input to a modular course on GeoEthics. Joint Assembly, Montreal, Program with Abstr, May 2015. Ryan, A.M. and Bank, C. 2015. Ethics in Geoscience: Our Integrity is at Stake. Atlantic Geoscience Society Annual Colloquium, Program with Abstracts, January 2015.

*DesJardins, V. and Ryan, A.M., 2015. Exploring the effect of chloride from deicing salts on heavy metal concentrations in urban soils: a case study in Halifax, Nova Scotia, Canada. Atlantic Geoscience Society Program with Abstracts, January 2015.

Cronin, V., Di Capua, G., Palinkas, C., Peppoloni, S., and Ryan, A.M., 2014. A Collaborative Effort to Build a Modular Course on GeoEthics. AGU Fall Meeting, San Francisco.

*Archibald, J., *DesJardins, V., *Broom, L-A., *Minichiello, J. and Ryan, A.M., 2014. Heavy metal concentrations in residential soils within the Halifax Peninsula, Nova Scotia: A pilot study. Atlantic Geoscience Society Annual Colloquium Abstracts, February 2014.

Bank, C. and Ryan, A.M. 2013. Ethics in Geosciences – what ethical dilemmas can we expect and how can we formally teach ethical behavior? GAC-MAC Joint Annual Meeting, Winnipeg; Program with Abstr, 2013.

O'Beirne-Ryan, A.M., 2011. Mineralogical transition from biotite to kaolinite during weathering: Evidence from three weathering profiles of differing ages from the South Mountain Batholith, Nova Scotia. GAC-MAC Joint Annual Meeting, Ottawa; Program with Abstracts, 2011.

*Tweedale, F., *Melanson, T., *Brooks, N., *Campbell, D., *Jacques, T., *Kelly, T., and O'Beirne-Ryan, A.M., 2010. Geochemical Data applied to Geohazard Mapping in Nova Scotia. Atlantic Geoscience Society, 36th Annual Colloquium, Wolfville, Feb 2010.

Ryan, R.J., O'Beirne-Ryan, A.M., *Finlayson, D., and *Parsons, A., 2009. Mobility of Uranium and Radon Associated with Uranium Roll Front Occurrences in the Horton Group of the Windsor Area, Nova Scotia, Canada. Proceedings, 24th International Applied Geochemistry Symposium (IAGS), Fredericton, New Brunswick, June 2009.