

## Dr. Chantel E. Markle, PhD

C.V.

Postdoctoral Research Fellow  
McMaster University  
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### Education

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- 2017 PhD: McMaster University, Department of Biology  
Nominated for **Distinguished Dissertation Award and Governor General's Academic Medal** for Research Excellence
- 2012 BSc (Hons): McMaster University, Faculty of Science

### Fellowships

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- 2017 – present Postdoctoral Research Fellow
- 2014 – 2017 NSERC Canada Graduate Scholarship – PhD (\$105,000)
- 2013 – 2014 NSERC Canada Graduate Scholarship – MSc (PhD stipend \$21,000)
- 2012 – 2013 Ontario Graduate Scholarship (\$15,000)
- 2011 University Senate Scholarship (\$800)
- 2010 D.M. Davies Scholarship (\$575)
- 2008 Entrance Scholarship (\$3,000)

### Grants

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|-------------|---|-----------|
| 2018 – 2022 | <i>Climate change and eastern Georgian Bay rattlesnake hibernacula: Assessing resilience, vulnerability, and adaptive management strategies.</i> Overall Benefits Grant, Ontario Ministry of Natural Resources and Forestry and Pattern Wind Energy LP. *Co-Principal Investigator. | \$357,500 |
| 2019        | <i>Effect of Phragmites australis management on turtle abundance.</i> Canadian Wildlife Service, Environment and Climate Change Canada. *Principal Investigator.  | \$19,000  |
| 2019 – 2020 | <i>Managing species at risk habitat through wetland water level crowdsourcing.</i> RBC Blue Water Foundation Project. *Co-Principal Investigator.   | \$30,000  |
| 2018 – 2019 | <i>Managing species at risk habitat through wetland water level crowdsourcing.</i> RBC Blue Water Foundation Project. *Co-Principal Investigator.   | \$30,000  |
| 2017 – 2018 | <i>URBAN 2.0: Emerging tools for monitoring aquatic ecosystems.</i> RBC Blue Water Foundation Project. *Co-Principal Investigator.  | \$20,000  |
| 2016 – 2017 | <i>URBAN 2.0: Emerging tools for monitoring aquatic ecosystems.</i> RBC Blue Water Foundation Project. *Co-Principal Investigator.  | \$22,640  |

2014 – 2016	<i>Assessing use of eco-passages by imperiled freshwater turtles.</i> Species at Risk Stewardship Fund, Ontario Ministry of Natural Resources and Forestry. *Co-Principal Investigator.	\$37,215
2014 – 2015	<i>Mapping the Minessing Wetlands (Ontario) for habitat restoration and conservation of species at risk.</i> Habitat Stewardship Fund, Environment and Climate Change Canada. *Co-Principal Investigator.	\$30,000

### Awards and Prizes

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2018	Canadian Association for Graduate Studies Distinguished Dissertation Award (Nomination). Recognizes Canadian doctoral dissertations that make unusually significant and original contributions to their academic field.
2017	Governor General's Academic Medal competition (Nomination). Recognizes the graduate student who achieves the highest academic standing in their doctoral degree program.
2016	Keith Leppmann Teaching Assistance Excellence Award (Nomination). Nominated by undergraduate students based on commitment to teaching, reliability, enthusiasm for subject matter, personality, adaptability, and communication skills.
2016	Biology Travel Scholarship, Canadian Herpetological Society Conference
2015	Clemens-Rigler Travel Award, International Association of Great Lakes Research
2012	Best Talk, Biology Undergraduate Symposium
2012	Spatial Content Award, The Weather Network

### Publications

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#### Journal Articles:

- Markle, C.E.**, Wilkinson, S.L., & J.M. Waddington. In review. Initial impacts of wildfire on freshwater turtle nesting habitat. *Journal of Wildlife Management*, JWM-19-0415.
- Markle, C.E.**, Moore, P.A., & J.M. Waddington. In review. Primary drivers of reptile overwintering habitat suitability: Integrating wetland ecohydrology and spatial complexity. *BioScience*, BIOS-19-0305.
- Markle, C.E.**, Moore, P.A., & J.M. Waddington. In revision. Temporal variability of overwintering conditions for a species-at-risk snake: Implications for climate change and habitat management. *Global Ecology and Conservation*, GECCO-2019-587.
12. Paterson, J.E., Baxter-Gilbert, J., Beaudry, F., Carstairs, S., Chow-Fraser, P., Edge, C.B., Lentini, A.M., Litzgus, J.D., **Markle, C.E.**, McKeown, K., Moore, J.A., Refsnider, J.M., Riley, J.L., Rouse, J.D., Seburn, D.C., Zimmerling, J.R., & C.M. Davy. 2019. Road avoidance and its energetic consequences for reptiles. *Ecology and Evolution* 2019:1–10. doi:10.1002/ece3.5515.
11. Piczak, M.L., **Markle, C.E.**, & P. Chow-Fraser. 2019. Decades of road mortality cause severe decline in a common snapping turtle population. *Chelonian Conservation and Biology* 18(2):231–240.

10. Moore, P.A., Smolarz, A.G., **Markle, C.E.**, & J.M. Waddington. 2019. Hydrological and thermal properties of moss and lichen species on rock barrens: Implications for turtle nesting habitat. *Ecohydrology* 12(2):e2057. doi:10.1002/eco.2057.
9. **Markle, C.E.**, Rutledge, J.M., & P. Chow-Fraser. 2018. Factors affecting coastal wetland occupancy for the Eastern Musk Turtle (*Sternotherus odoratus*). *Herpetologica* 74(3):236–244. \*International media coverage by the Great Lakes Echo. [Link: Great Lakes Echo](#).
8. Smolarz, A.G., Moore, P.A., **Markle, C.E.**, & J.M. Waddington. 2018. Identifying resilient eastern massasauga rattlesnake (*Sistrurus catenatus*) peatland hummock hibernacula. *Canadian Journal of Zoology*. doi:10.1139/cjz-2017-0334.
7. **Markle, C.E.** & P. Chow-Fraser. 2018. Effects of European Common Reed on Blanding’s Turtle Spatial Ecology. *Journal of Wildlife Management*. doi:10.1002/jwmg.21435.
6. **Markle, C.E.**, Chow-Fraser, G., & P. Chow-Fraser. 2018. Long-term habitat changes in a protected area: Implications for herpetofauna habitat management and restoration. *PLoS ONE* 13(2):e0192134.
5. **Markle, C.E.**, Gillingwater, S.D., Levick, R., & P. Chow-Fraser. 2017. The true cost of partial fencing: Evaluating strategies to reduce reptile road mortality. *Wildlife Society Bulletin* 41(2):342–350. \*International media coverage with 150 articles/radio shows discussing the results of the decade-long road mortality study. Notable interviews and coverage included BBC News, Popular Science, Canadian Press, Toronto Star, CBC, CTV, and Global Television. [Link: Summary of Coverage](#). Interviewed and filmed for an episode of Striking Balance documentary series produced by TVO and the Knowledge Network. [www.strikingbalance.ca](http://www.strikingbalance.ca).
4. **Markle, C.E.** & P. Chow-Fraser. 2017. Thermal characteristics of overwintering sites for the Blanding’s turtle (*Emydoidea blandingii*) across three study areas in Ontario, Canada. *Herpetological Conservation and Biology* 12:241–251.
3. **Markle, C.E.** & P. Chow-Fraser. 2016. An integrative approach to regional mapping of suitable habitat for the Blanding’s turtle (*Emydoidea blandingii*) on islands in Georgian Bay, Lake Huron. *Global Ecology and Conservation* 6(2016):219–231.
2. Marcaccio, J.V., **Markle, C.E.**, & P. Chow-Fraser. 2016. Use of fixed-wing and multi-rotor unmanned aerial vehicles to map dynamic changes in a freshwater marsh. *Journal of Unmanned Vehicle Systems* 4(3):193–202.
1. **Markle, C.E.** & P. Chow-Fraser. 2014. Habitat selection by the Blanding’s turtle (*Emydoidea blandingii*) on a protected island in Georgian Bay, Lake Huron. *Chelonian Conservation and Biology* 13(2):216–226. \*International media coverage by the Great Lakes Echo. [Link: Great Lakes Echo](#).

#### Peer-Reviewed Proceedings:

1. Marcaccio, J.V., **Markle, C.E.**, & P. Chow-Fraser. 2015. Unmanned aerial vehicles produce high-resolution, seasonally-relevant imagery for classifying wetland vegetation. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, Volume XL-1/W4, 2015, International Conference on Unmanned Aerial Vehicles in Geomatics, 30 Aug – 02 Sep 2015, Toronto, Canada, pages 249–256. doi:10.5194/isprsarchives-XL-1-W4-249-2015.

### Book Chapters:

- Gillingwater, S.D, Levick, R., & **C.E Markle**. In revision. "Saving Long Point's Species at Risk". In S. C. Walls & K. M. O'Donnell (Eds.), *Strategies for Conservation Success in Herpetology*. Society for the Study of Amphibians and Reptiles. \*Invited contribution.
1. **Markle, C.E.** & P. Chow-Fraser. 2017. "Georgian Bay, Lake Huron: Freshwater turtles and their wetland habitat in a changing landscape". In E. Freedman & M. Neuzil (Eds.), *Biodiversity, Conservation and Environmental Management in the Great Lakes Basin: From passenger pigeons and pollution to public policy*. New York, USA: Routledge. \*Invited contribution.

### Reports:

2. **Markle, C.E.** 2019. Effect of *Phragmites australis* management on turtle abundance: Turtle visual encounter surveys at National Wildlife Areas before *Phragmites australis* treatment. Canadian Wildlife Service, Environment and Climate Change Canada, contract number 3000688187, 30 pp.
1. Rutledge, J., **Markle, C.E.**, Tedesci, A., & P. Chow-Fraser. 2016. Guide for Assessing Stream Health and Productivity: Periphyton Monitoring. RBC Blue Water Foundation. i + 22 pp.

### Invited Contributions

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#### Invited Talks and Speaking Engagements:

- 2020 World Wetlands Day, University of Waterloo
- 2020 Seminar Series, McMaster University
- 2019 Grundy Lake Provincial Park, Ontario Parks
- 2019 French River Provincial Park, Ontario Parks
- 2018 The Wildlife Society, International Conference, Ohio, USA
- 2018 Trent University, Species at Risk Research Lab, Peterborough
- 2017 Departmental Seminar, McMaster University
- 2016 EcoExplorer Community Event, Rouge National Urban Park, Toronto
- 2015 EcoExplorer Community Event, Rouge National Urban Park, Toronto
- 2015 University of Waterloo Ecological Restoration Field Course
- 2014 Minesing Wetlands/Nottawasaga River Annual Meeting, NVCA
- 2014 Ingersoll Nature Club, Ingersoll
- 2014 Otter Valley Naturalist Club, Tillsonburg
- 2014 University of Waterloo Ecological Restoration Field Course
- 2014 EcoExplorer Community Event, Rouge Park, Toronto
- 2013 EcoExplorer Community Event, Rouge Park, Toronto
- 2012 Graduate Student Day, McMaster University

#### Invited Workshops and Working Groups:

- 2019 – present Point Pelee National Park Marsh Restoration Group, Ontario, Canada
- 2019 Spotted, Blanding's, and Wood Turtle Conservation Symposium, WV, USA
- 2016 Blanding's and Wood Turtle Conservation Symposium, MA, USA

## Communication and Outreach

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I have been interviewed for print, online, radio, and TV outlets across the world including the Canadian Press, Toronto Star, CBC, CBC Radio One, CTV, Global Television, BBC News, and Popular Science. My research has been featured internationally in over 150 different press releases.

### Selected coverage:

- “How an Ontario community set a global example for saving turtles on a deadly road” by Allison Vuchnich and Veronica Tang. 26 May 2017. [Link: Global News](#).
- “Endangered turtles saved by citizens of Ontario hamlet” by Nicole Mortillaro. 26 May 2017. [Link: CBC](#).
- “Ontario community’s work to prevent turtles, snakes being killed a model for others” by Michelle McQuigge. 26 May 2017. [Link: CTV News](#).
- “Going on a road trip? Study shows how to reduce roadkill” by Torah Kachur. 1 June 2017. [Link: CBC](#).
- “Turtle X-ing: Why a rural Ontario community is being lauded for wildlife preservation effort” by Michelle McQuigge. 26 May 2017. [Link: Toronto Sun](#).
- “Turtle disaster avoided with roadkill rescue” by Sean Coughlan. 31 May 2017. [Link: BBC](#).
- “Saving turtles along deadly stretch of road”. 3 June 2017, Toronto Star, print.
- “Canadian researchers put secretive turtle on risk radar” by Quinn Zimmerman. 13 December 2018. [Link: Great Lakes Echo](#).
- “Researchers study need to protect Great Lakes turtle habitat” by Eric Freedman. 7 April 2015. [Link: Great Lakes Echo](#).

### Public Outreach:

2019	GIS Day, McMaster University
2017	Nelson High School Nature Group, Burlington
2016	EcoExplorer Community Event, Rouge National Urban Park, Toronto
2016	GIS Day, McMaster University
2015	EcoExplorer Community Event, Rouge National Urban Park, Toronto
2014	Ingersoll Nature Club, Ingersoll
2014	Otter Valley Naturalist Club, Tillsonburg
2014	University of Waterloo Ecological Restoration Field Course
2014	EcoExplorer Community Event, Rouge Park, Toronto
2013	EcoExplorer Community Event, Rouge Park, Toronto
2013	Published article in Landscript, a newsletter for Georgian Bay residents/cottagers

### Contributed Talks and Posters

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2019	Latonnell Conservation Symposium*, Ontario, Canada (Presented by D. Hudson)
2019	Spotted, Blanding’s and Wood Turtle Symposium*, WV, USA
2019	Global Water Futures*, Ontario, Canada
2019	French River Provincial Park, Ontario, Canada
2017	Centre of Applied Science in Ontario Protected Areas, Ontario, Canada
2017	International Association for Great Lakes Research, MI, USA

- 2017 Long Point World Biosphere Reserve Foundation Research Conference, Ontario
- 2016 McMaster Water Week\*, Ontario, Canada
- 2016 International Association for Great Lakes Research, Ontario, Canada
- 2016 Long Point World Biosphere Reserve Foundation Research Conference, Ontario
- 2016 Royal Botanical Gardens, Ontario, Canada
- 2015 Canadian Herpetological Society, New Brunswick, Canada
- 2014 Nottawasaga Valley Conservation Authority, Ontario, Canada
- 2014 International Association for Great Lakes Research, Ontario, Canada
- 2014 Toronto Zoo, Ontario, Canada
- 2014 Ontario Turtle Conservation Group, Ontario, Canada
- 2014 Ontario Wetlands Conference, Ontario, Canada
- 2013 International Association for Great Lakes Research, IN, USA
- 2012 International Association for Great Lakes Research, Ontario, Canada
- 2012 Undergraduate Biology Symposium, Ontario, Canada
- 2012 Ontario Wetlands Conference\*, Ontario, Canada

\*indicates poster

## Teaching and Supervision

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### Personal Development Courses:

- 2017 Peer-Evaluated Teaching Experience (EDU 650, McMaster University)
- 2016 Essential Skills in Teaching and Learning (EDU 600, McMaster University)

### Certificates:

Teaching and Learning Foundations Certificate, Instructional Skills Workshop Certificate

### Graduate Students:

- 2019 – present Taylor North, MSc (co-supervisor)
- 2018 – present Danielle Hudson, MSc (co-supervisor)
- 2017 – present Nicole Sandler, MSc (co-supervisor)
- 2018 Morgan Piczak, MSc (co-supervisor)

### Undergraduate Students:

- 2019 – present Hope Freeman, undergraduate senior thesis (co-supervisor)
- 2018 – 2019 Taylor North, undergraduate senior thesis (co-supervisor)
- 2014 – 2015 Rebecca Graves, undergraduate senior project (co-supervisor)
- 2014 – 2015 Nicole Zathey, undergraduate senior thesis (co-supervisor)
- 2014 Jessica Watts, undergraduate research practicum (co-supervisor)
- 2013 – 2014 Aman Gill, undergraduate senior thesis (co-supervisor)
- 2012 Margaret Sawatzky, NSERC undergraduate research project (co-supervisor)

### Guest Lectures:

- 2018 Ecology (2F03, McMaster University) [\\*multi-lecture series](#)
- 2017 Ecology (2F03, McMaster University) [\\*multi-lecture series](#)
- 2017 Global Change and Ecosystems (3B03, McMaster University)

- 2016 Global Environment and Sustainability (3D03, McMaster University)  
[\\*multi-lecture series](#)
- 2015 Global Environment and Sustainability (3D03, McMaster University)  
[\\*multi-lecture series](#)
- 2015 Applied Ecology (3F03, McMaster University) [\\*multi-lecture series](#)
- 2014 Remote Sensing (3RS3, McMaster University)
- 2014 Applied Ecology (3F03, McMaster University) [\\*multi-lecture series](#)

### **Teaching Assistant:**

- 2017 Wetland biodiversity: coastal marshes to vernal pools (BIO 3R03 Field course)  
[\\*Co-instructor](#)
- 2017 Advanced Topics in Ecology (BIO 4A03)
- 2016 Communities and Ecosystems (BIO 3DD3)
- 2016 Global Environment and Sustainability (LS 3D03)  
[\\*Head teaching assistant. In addition to regular duties, I managed final group projects for ~200 students and delivered multi-lecture series.](#)
- 2015 Global Environment and Sustainability (LS 3D03)  
[\\*Head teaching assistant. In addition to regular duties, I managed final group projects for ~200 students and delivered multi-lecture series.](#)
- 2015 Applied Ecology Seminars (LS 3F03)
- 2014 Global Environment and Sustainability (LS 3D03)
- 2014 Applied Ecology Seminars (LS 3F03)
- 2013 Global Environment and Sustainability (LS 3D03)
- 2013 Communities and Ecosystems (BIO 3DD3)
- 2013 Indicators of ecosystem health: streams and wetlands (BIO 3R03 Field course)  
[\\*Co-instructor](#)
- 2012 Communities and Ecosystems (BIO 3DD3)

### **Service and Leadership**

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#### **Volunteer Activities:**

- 2019 Turtle Field Techniques Training, Grundy Lake Provincial Park, Ontario Parks
- 2018 Research Poster Judge, Global Water Futures: Water Week Research Showcase
- 2017 Executive Secretary for Biology Graduate Student Society, McMaster University
- 2016 Executive Secretary for Biology Graduate Student Society, McMaster University
- 2016 Session Chair, Interdisciplinary approaches to solve problems relating to Great Lakes coastal wetlands, International Association for Great Lakes Research
- 2016 Student mentor to new international graduate students (Mentor Program)
- 2016 Biology Undergraduate Symposium Judge
- 2015 Executive Secretary for Biology Graduate Student Society, McMaster University
- 2015 Student mentor to new international graduate students (Mentor Program)
- 2015 Session Chair, Novel techniques for wetland habitat management and assessment, International Association for Great Lakes Research
- 2015 Biology Undergraduate Symposium Judge
- 2014 Executive Secretary for Biology Graduate Student Society

- 2014 Session Chair, Reptile and amphibian conservation in a changing landscape, International Association for Great Lakes Research
- 2014 Bay Area Science and Engineering Fair (BASEF) Judge, Mohawk College
- 2014 Abstract Selection Committee, Biology Graduate Research Day
- 2013 Executive Secretary for Biology Graduate Student Society
- 2013 NSERC Undergraduate Student Research Award Presentations Judge
- 2013 Ontario Biology Day Judge
- 2013 Abstract Selection Committee, Biology Graduate Research Day
- 2011 Amphibian and habitat surveys, Marsh Monitoring Program
- 2011 English Tutor, McMaster University

**Reviewing for Journals:**

Chelonian Conservation and Biology, Copeia, Current Herpetology, Global Ecology and Conservation, Herpetologica, Herpetological Review, Tropical Conservation Science, Wildlife Society Bulletin.

**Professional Memberships**

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Canadian Herpetological Society, The Wildlife Society, Herpetologists' League.

**Additional Certifications**

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Firearms Possession and Acquisition Licence, Class G Driver's Licence, PADI Open Water Scuba Diver, Pleasure Craft Operator, Ontario Hunting and Outdoors Card, Standard First Aid and CPR/AED Level C, Enform Bear Awareness.