

SPENCER ELFORD

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EDUCATION

Class of 2020

MSc., Geography

University of Toronto, Toronto, ON

Alexander Graham Bell Canada Graduate Scholarship Holder

Class of 2017

BSc. Hons, Earth & Environmental Science, Minor in GIS

McMaster University, Hamilton ON

Deans Honour Role: 2013,2014,2015,2016

AWARDS

2020

Esri Young Scholar

2018

Environment Canada Meteorology and Atmosphere Scholarship

2018

NSERC - Michael Smith Foreign Study Scholarship

2018

Pitney-Bowes Spatial Data-Duel, First Place

2018

NSERC CGS-M Scholarship

2018

David Woodward Digital Cartography Award

2018

Upwind Downwind Air Pollution Conference – Top Poster Presenter

2017

Esri Canada GIS Scholarship

2017

International Year of Global Understanding – Web Map Design Winner

2016

Esri Global Content Challenge – Web Cartography Winner

2016

Esri Development Center McMaster GIS Student of the Year Award

RESEARCH INTERESTS & CAREER GOALS

- Geographic Information Systems
- Data Science & Modelling
- Cities and Urban Environments
- Cartography and Data Visualization

RESEARCH EXPERIENCE

2017 – 2020

MSc. Student, University of Toronto, Supervisor: Dr. Matthew Adams

- Applications of atmospheric pollutant dispersion and distribution models for examining pollutant exposure risk in urban landscapes
- Participated in a 4-month research exchange in Hong Kong (Winter 2019)

2018

Research Assistant, McMaster University, Supervisor: Dr. Christopher Higgins

- Data analysis with the Institute for Transportation and Logistics, contributions to a research paper on Land-Value uplift & Real Estate

2016

Senior Thesis, McMaster University, Supervisor: Dr. Lesley Warren

- Geochemical profiling and spatial patterns of Sulfur Oxidation intermediates in base-metal mine tailings waste

2015 – 2016

Research Assistant, Ancient DNA Center, Supervisor: Dr. Henry Schwarcz

- Co-Author of 2 publications related to physical anthropology and the applications of GIS as a research tool

EXTRACURRICULAR EXPERIENCE

- 2019 **GIS Instructor**, Canadian Red Cross & OpenStreetMaps Missing Maps Project
- Provided specialist support to participants engaging in mapping projects for humanitarian/emergency response initiatives in developing countries.
- 2017- 2018 **Cartographer**, Maximum City
- Principal cartographer for the creation of large-format hi-resolution cartographic products for use in secondary school summer camps.
- 2017– 2018 **Advisory Board**, Center for Urban Environment, University of Toronto: Mississauga
- Advisor to the director throughout the goal-oriented decision making process on the pursuit of grants, research proposals and event planning
- 2016– 2017 **Co-President**, Geographers Without Borders
- Coordinated development of several geography and GIS projects related to civil, environmental and social geography in the local community
- 2015 – 2017 **Esri Student Associate & GIS Ambassador**, McMaster University
- Contributed to outreach programs designed to engage and educate the local community through GIS and mapping products.

WORK EXPERIENCE

- 2019 – 2020 **GIS Research Assistant**
- Principal developer of tutorial manuals for senior level GIS courses. Designed lab assignments for spatiotemporal analysis, Space Time-Cube mining, and 3D visualization in ArcGIS Pro.
 - Led and evaluated technical lab sessions for courses on Introductory GIS, Geostatistical Analysis in R, Cartography, and Remote Sensing
- 2018 **GIS Researcher**, Institute for Transportation & Logistics – McMaster University
- Collaborated with an interdisciplinary team of researchers to examine Land-Value uplift and spatio-temporal trends in real estate in Hamilton.\
- 2017 – 2018 **GIS Web Map Specialist**, Principal Point Geospatial Solutions,
- Principal lead in the development and deployment of web applications and web maps using Esri’s web GIS (AGOL) platform and ArcMap 10.x
- 2016– 2017 **GIS Specialist**, Firestone Institute for Respiratory Health, McMaster University
- Conducted geospatial analyses for provincial scale reports in the fields of epidemiology and respiratory health (Python, ArcGIS)
- 2016 **Junior GIS Specialist**, Ontario Ministry of Agriculture, Food, and Rural Affairs
- Developed novel workflows in Python for feature extraction of LiDAR and Point cloud datasets for agriculture research and reports

PUBLICATIONS

Elford, S., Adams, M.D., 2019. Exposure to ultrafine particulate air pollution in the school commute: Examining low-dose route optimization with terrain-enforced dosage modelling. Environ. Res. <https://doi.org/10.1016/j.envres.2019.108674>

Elford, S., Adams, M.D., 2019. Geospatial datasets describing route geometry and ultrafine particulate matter dosage for children during shortest-distance and lowest-dosage school commutes in Toronto, Canada. Data Br. <https://doi.org/10.1016/j.dib.2019.104792>

Emery M, Murchie T, Stark R, **Elford S**, Schwarcz H, Prowse T. (2018). Mapping the Origins of Imperial Roman Workers (1st – 4th century CE) at Vagnari, Southern Italy, using $^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{18}\text{O}$ Variability. *American Journal of Physical Anthropology*.

Emery M.V., Prowse T.L., **Elford S.**, Schwarcz H.P., Brickley M. (2017). Determining the Geographic Origins of a War of 1812 Skeletal Sample, Stoney Creek, Ontario, Using Oxygen and Strontium Isotopes Coupled with GIS-based Multi-Criteria Evaluation Analysis. *Journal of Archaeological Science: Reports*

CONFERENCE PRESENTATIONS

Elford S., Adams M.D. (2018) Using GIS to examine Route Optimization in the School Commute: Canadian Association of Geographers (CAG) Annual Meeting, August 12th 2018 , Quebec, Canada

Elford S., Adams M.D. (2018) Air Pollution Exposure Risk to School Age Children: GIS Based modelling to examine how commute behaviour affects exposure on the commute. American Association of Geographers (AAG) Annual Meeting, April 10 2018, New Orleans, USA

Elford S., Chastko K., Gigliotti T. (2017) Developing of 3D exterior & interior models from drone-captured images. Esri Canada GIS in Education and Research Conference, Oct 11, 2017, Toronto, Canada