ALEXANDER REY, EIT

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Education

Doctor of Philosophy, Civil Engineering ▪ September 2016 – May 2020 (anticipated)
Queen's University ▪ Kingston, Ontario

- Currently completing thesis, which is focused on the behavior of shallow water, including retention times in wastewater stabilization ponds and climate enhanced hurricane driven flooding in estuaries
- Implemented an online updating forecast for wave, current, and water levels in North Carolina, USA
- Senior Campus Tour Guide and co-coordinator of the Civil Engineering Speakers Forum
- Completed the US Army Corps of Engineers coastal training course
- Supervised by Dr. Ryan Mulligan, Dr. Ana Maria da Silva, and Dr. Yves Filion

Bachelor of Science, Civil Engineering ▪ September 2012 – May 2016
Queen's University ▪ Kingston, Ontario

- Completed a capstone project on port design and coastal modeling with Baird and Associates
- Director of Human Resources for the Student Engineering Society
- Member of the Queen's Mostly Autonomous Sailboat Team

Professional Credentials

- Engineer-In-Training (EIT). Professional Engineers of Ontario
- Ontario Society of Professional Engineers
- American Geophysical Union

Peer-Reviewed Journal Publications

Rey, A., Mulligan, R. "Influence of Hurricane Tack and Wind Field Variability on Real-time Forecast Simulations of Coastal Conditions." *Manuscript in preparation for submission to Geophysical Research Letters.*

Rey, A., Mulligan, R., Corbett, R. "Impact of Wind Field and Precipitation on Back-Barrier Estuary Hurricane Storm Surges." *Manuscript in preparation for submission to Journal of Geophysical Research: Oceans.*

Rey, A., Mulligan, R., Boegman, L., Filion, Y., da Silva, A. M., Champagne, P. "Three-dimensional Hydrodynamic Behavior of an Operational Wastewater Stabilization Pond." *Manuscript in preparation for submission to Advances in Water Resources.*

Rey, A., Mulligan, R., Boegman, L., Filion, Y., da Silva, A. M., Champagne, P. "Three-dimensional Temperature Stratification in an Operational Wastewater Stabilization Pond." *Manuscript in preparation for submission to Environmental Science and Technology.*

Mulligan, R. P., Mallinson, D. J., Clunies, G. J., **Rey, A**., Culver, S. J., Zaremba, N., Leorri, E. and Mitra, S. (2019) "Estuarine responses to long-term changes in inlets, morphology and sea-level rise", *Journal of Geophysical Research: Oceans. John Wiley & Sons, Ltd, p. 2018JC014732. doi: 10.1029/2018JC014732.*

Fruetel, C., Mumford, K. G., Ferreira da Silva, A. M., **Rey, A**., Bascom, K. S. (2019) "A laboratory method for the visualization and quantification of hyporheic flow paths and velocities", *Canadian Journal of Civil Engineering. NRC Research Press, 46(5), pp. 448–457. doi: 10.1139/cjce-2018-0131.*

Conference Publications

Rey, A., Mulligan, R., Corbett, R., Wadman, HM. (2019). "Numerical Modelling of Storm-Driven Sediment Transport in Currituck Sound, NC." *International Conference on Coastal Sediments 2019. St. Petersburg, Florida, United States.*

Rey, A., Mulligan, R., Boegman, L., Filion, Y., da Silva, A. M., Champagne, P. (2018). "Impact of Control Structures on Hydraulic Retention Time in Wastewater Stabilization Ponds." *1st International WDSA / CCWI 2018 Joint Conference, Kingston, Ontario, Canada, Y. Filion and M. Hulley, eds.*

Mahyari, F., **Rey, A.,** Boegman, L., (2018). "Three-dimensional simulation of hydrodynamics and water quality in a wastewater stabilization pond." *1st International WDSA / CCWI 2018 Joint Conference, Kingston, Ontario, Canada, Y. Filion and M. Hulley, eds.*

da Silva, A. M. F., Mumford, K. G., Mirzaei, S. H. S., Fruetel, C., **Rey, A.** (2016). "Physical and numerical modeling of hyporheic flow through a gravel bar." *River flow 2016: proceedings of the International Conference on Fluvial Hydraulics, G. Constantinescu, M. Garcia, and D. Hanes, eds., CRC Press, St. Louis, USA, 1364–1369.*

Presentations

Rey, A., Mulligan, R. (2020). "Real-time high-resolution forecasting of the coastal ocean during a hurricane." *Ocean Sciences Meeting 2020- San Diego, California, United States.*

Rey, A., Mulligan, R. (2018). "Three-Dimensional Modelling of an Operational Wastewater Stabilization Pond." *Young Coastal Scientists and Engineers Conference – Americas, Mérida, Yucatán, México.*

Rey, A., Sauder, M., Mulligan, R., Boegman, L., Filion, Y., da Silva, A. M., and Champagne, P. (2017). "Modeling and validation of stratification and hydrodynamics in a wastewater stabilization pond using Delft3D." *S2Small2017 Conference on Small Water & Wastewater Systems and Resources Oriented Sanitation- Nantes, France.*

Recognition

- Robert J. Mitchel Prize (2018)
- Dean's Graduate Research Assistant Award (2018)
- Aquahacking Startup Competition Finalist (2018)
- Professional Engineers of Ontario Ethics Examination (2018)
- Dean's Teaching Assistant Award (2018)
- S.D. Lash Scholarship (2016)
- NSERC Undergraduate Student Research Award (2015)

Committees and Service

Grant Review Team ▪ September 2018 – Ongoing
Ontario Trillium Foundation ▪ Kingston, Ontario

- Provincially appointed committee for review of applications to the Ontario Trillium Foundation
- Critically evaluated grant proposals against a set of criteria to maximize foundation impact
- Maintained information confidentiality following the Conflict of Interest Act

Municipal Appeals Committee ▪ November 2017 – December 2019
City of Kingston ▪ Kingston, Ontario

- Municipally appointed citizen representative on the appeals committee
- Heard and adjudicated appeal requests arising under the property standards and licensing bylaws
- Responsible for interpreting bylaws and following the Statutory Powers Procedures Act

Queen's University Service Experience

Research Advisory Committee ▪ May 2018 – Ongoing
Beaty Water Research Centre, Queen's University ▪ Kingston, Ontario

- Student representative to the advisory board of an interdisciplinary water research centre
- Assisted with identifying possible grant and research funding streams
- Provided input on a significant move to a new facility

Civil Engineering Speaker Series (Civil Forum) Coordinator ▪ September 2017 – August 2018
Civil Engineering Graduate Student Society ▪ Kingston, Ontario

- Coordinated the Civil Engineering Speaker series, inviting 20 guests to present on a range of topics
- Recruited potential speakers at university and industry events
- Reduced food expenses by 15% through a competitive tendering process
- Assisted with Civil Engineering Graduate Student Society Initiatives

Senate Residence Committee ▪ September 2016 – Ongoing
Queen's University ▪ Kingston, Ontario

- Member of the oversight group for the Queen's residences system
- Member of the budget subcommittee, responsible for residence rates and spending priorities
- Lead a feasibility assessment on extending discount dining hall lunches to teaching assistants

Teaching Assistant Positions

- CIVL 200: Professional Skills II — Instructor: Dr. Cole Van De Ven
- CIVL 460: Civil Engineering Design and Practice (Capstone) — Instructor: Dr. Kent Novakowski
- CIVL 455: River Engineering — Instructor: Dr. Ana Maria da Silva
- CIVL 473: Water Resources Systems — Instructor: Dr. Yves Filion

Employment Experience

Cognitive Assessment Redesign Marker ▪ April 2018 – December 2018
Faculty of Applied Science, Queen's University ▪ Kingston, Ontario

- Marking assistant for the cognitive assessment redesign project
- Responsible for grading capstone design projects against the international *VALUE* rubric

Engineer-In-Training ▪ May 2016 – August 2016
Baird and Associates ▪ Ottawa, Ontario

- Imported and analyzed field data to evaluate model performance
- Created a database of National Data Buoy Center information to streamline model calibration
- Visualized modeled and measured results to in an interactive format to evaluate accuracy
- Wrote automating scripts to significantly reduce time required for data import

Senior Tour Guide ▪ May 2015 – Ongoing
Queen's University ▪ Kingston, Ontario

- Represented Queen's University during recruitment activities
- Organized on-campus recruitment events and coordinated staffing levels

Research Assistant ▪ May 2015 – September 2015
Queen's University ▪ Kingston, Ontario

- Worked with a team to design and instrument a hydraulic flume experiment
- Designed processing code to quantify flow paths from high speed digital photography

Languages

- English – First language
- French – Intermediate Proficiency