Daniel M. Robb

Queen's University
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Education

PhD, University of British Columbia, Civil Engineering   2023
Advisor: Gregory A. Lawrence
Thesis: Physical processes affecting turbidity in a glacier-fed hydroelectric reservoir
Subject areas: environmental fluid mechanics, physical limnology, water resources engineering
GPA: 93% (out of 100%)

MEng, McGill University, Civil Engineering   2013
Advisor: Susan J. Gaskin
Thesis: Smoothed particle hydrodynamics applied to river ice dynamics
Subject areas: hydraulic and water resources engineering, computational fluid dynamics
GPA: 4.0 (out of 4.0)

BASc, University of British Columbia, Civil Engineering   2010
GPA: 90% (out of 100%)

Current Position

Postdoctoral Fellow, Department of Civil Engineering, Queen's University   2023–Present
Advisor: Jason Olsthoorn
Project: Numerical investigation of sediment resuspension beneath internal solitary waves
Subject areas: environmental fluid mechanics, sediment transport

Honours and Awards

Queen's Vice-Principal Research Postdoctoral Fellowship ($100,000)   2023
NSERC Alexander Graham Bell CGS D, Doctoral Program ($105,000)   2017
UBC Faculty of Applied Science Graduate Award ($10,000)   2017
NSERC Alexander Graham Bell CGS M, Masters Program ($17,500)   2010
McGill Provost's Graduate Fellowship ($4,500)   2010, 2011
NSERC Undergraduate Student Research Awards Program ($4,500)   2009

Publications

1. **Robb, D. M.**, Pieters, R., & Lawrence, G. A. (2025). The bathymetric effect and epilimnetic turbidity in a glacier-fed hydroelectric reservoir. *ARC Geophysical Research*, 1(1), 6.
2. Olsthoorn, J., Kaminski, A. K., & **Robb, D. M.** (2023). Dynamics of asymmetric stratified shear instabilities. *Physical Review Fluids*, 8(2), 024501.
3. **Robb, D. M.**, Pieters, R., & Lawrence, G. A. (2021). Fate of turbid glacial inflows in a hydroelectric reservoir. *Environmental Fluid Mechanics*, 21(6), 1201–1225.
4. **Robb, D. M.**, Gaskin, S. J., & Marongiu, J.-C. (2016). SPH-DEM model for free-surface flows containing solids applied to river ice jams. *Journal of Hydraulic Research*, 54(1), 27–40.

Relevant Work Experience

Northwest Hydraulic Consultants, Project Engineer (contract, 6 months), North Vancouver	2023
Northwest Hydraulic Consultants, Project Engineer (full-time), North Vancouver	2013–2016
Andritz Hydro, Research and Development, Intern (9 months), Vevey, Switzerland	2011
Coanda Research and Development, Burnaby, Co-op Student (4 months)	2010
UBC Environmental Fluid Mechanics Undergraduate Research Assistant (4 months)	2009
Worley Parsons, Singapore, Co-op Student (4 months)	2008
Klohn Crippen Berger, Vancouver, Co-op Student (8 months)	2007
Douglas Partners, Sydney, Australia, Co-op Student (8 months)	2006

Teaching

Queen's University

Guest Lecturer, Hydrodynamic Modelling (CIVL 851), for J. Olsthoorn	2023

University of British Columbia

Guest Lecturer, Fluid Mechanics (CIVL 215), for G. A. Lawrence	2019
Teaching Assistant, Environmental Fluid Mechanics (CIVL 541), for G. A. Lawrence	2023
Teaching Assistant, Environmental Hydraulics (CIVL 416), for G. A. Lawrence	2020
Teaching Assistant, Fluid Mechanics (CIVL 215), for G. A. Lawrence	2017–2019

McGill University

Teaching Assistant, Dynamics (CIVE 206), for S. J. Gaskin	2012
Teaching Assistant, Hydraulic Engineering (CIVE 428), for S. J. Gaskin	2011

Technical Training and Professional Development

Certificate in Professional Development for Postdoctoral Researchers (Queen's)	2023
Turbulence and Mixing. L. Armi (Scripps Oceanography) and G. A. Lawrence (UBC)	2019
Physical Limnology. B. Boehrer (Helmholtz Centre for Env. Res.) Magdeburg, Germany	2019
Gerhard Jirka Summer School on Environmental Fluid Mechanics. Lucerne, Switzerland	2012

Graduate Courses Taken

University of British Columbia   2016–2023
Environmental Fluid Mechanics (CIVL 541)
Physical Limnology (CIVL 598)
Estuary Hydraulics (CIVL 547)
Numerical Techniques for Ocean, Atmosphere and Earth Scientists (EOSC 511)
Advanced Geophysical Fluid Dynamics (EOSC 512)

McGill University   2010–2013
Computational Hydraulics (CIVE 572)
Advanced Fluid Mechanics (MECH 562)
Applied Mathematics (MECH 605)
Fundamentals of Turbulent Flow (MECH 656)
Atmospheric and Oceanic Dynamics (ATOC 512)

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Professional Affiliations

Engineers and Geoscientists of British Columbia, P.Eng., Licence 43785   2016–Present

Skills

Languages: English (native), French (fluent)
Computer programming: Python (advanced), Matlab (advanced), C/C++ (intermediate)

Service

Manuscript reviewer for *Journal of Hydraulic Research* and *Journal of Hydraulic Engineering*
Reviewer for the AGU23 Outstanding Student Presentation Awards (Dec 2023, volunteer)
Organizer for the UBC Physical Oceanography Seminar Series (Jan–Aug 2018, volunteer)

Invited Presentations

Robb, D. M., Pieters, R., & Lawrence, G. A. (2023). Physical processes affecting turbidity in the epilimnion of a glacier-fed reservoir. AGU Fall Meeting 2023, H51E-01.

Conferences

Robb, D. M., & Olsthoorn, J. (2024). Sediment resuspension beneath periodic internal solitary waves of depression over a flat bottom. APS Division of Fluid Dynamics Abstracts.

Robb, D. M., Pieters, R., & Lawrence, G. A. (2022). Seiching, upwelling and particle settling in a stratified reservoir. IX International Symposium on Stratified Flows, Cambridge, UK.

Robb, D. M., Pieters, R., & Lawrence, G. A. (2022). Epilimnetic turbidity in a glacier-fed reservoir. 24th Workshop on Physical Processes in Natural Waters, Vancouver, Canada.

Robb, D. M., Pieters, R., & Lawrence, G. A. (2020). Transport of glacial meltwater to the surface layer of a stratified reservoir. AGU Fall Meeting 2020, H125-06.

Kaminski, A., Olsthoorn, J., **Robb, D. M.**, & D'Asaro, E. (2019). Overturning structures in symmetric and asymmetric shear instabilities. APS Division of Fluid Dynamics Abstracts.

Robb, D. M., Pieters, R., & Lawrence, G. A. (2019). Glacial inflows in a hydroelectric reservoir. 22nd Workshop on Physical Processes in Natural Waters, Yichang, China.

Robb, D. M., Pieters, R., & Lawrence, G. A. (2018). Effects of hydropower operation on turbidity in a glacially-fed reservoir. 21st Workshop on Physical Processes in Natural Waters, Solothurn, Switzerland.

Robb, D. M., Gellis, M. S., Vasquez, J. A., & Wang, E. C. (2017). Tunnel replacement project: morphodynamic modelling of trench migration. 23rd Canadian Hydrotechnical Conference, Vancouver, Canada.

Robb, D. M., & Vasquez, J. (2015). Numerical simulation of dam-break flows using depth-averaged hydrodynamic and three-dimensional CFD models. 22nd Canadian Hydrotechnical Conference, Montreal, Canada.

Technical Reports

Perrin, C. J., Pieters, R., Harding, J., **Robb, D. M.**, & Bennet, S. (2018) Carpenter Reservoir Productivity Model (BRGMON10). Report prepared for BC Hydro.

Pieters, R., **Robb, D. M.**, Lawrence, G. A., & Bray, K. (2010) Hydrology of Kinbasket and Revelstoke Reservoirs, 2009 (CLBMON-3). Report prepared for BC Hydro.

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Selected Project Experience

Fraser River Tunnel Project, BC, Canada
Analysis of field data collected in the Fraser River salt wedge to investigate the hydrodynamics and sedimentation patterns in the vicinity of a proposed eight-lane tunnel to replace the existing George Massey Tunnel. Data included time series measurements of water level, temperature, conductivity, and turbidity from a variety of sources. Northwest Hydraulic Consultants (2023).

Skagit River Hydroelectric Project, Water Quality Model, Washington, USA
Hydrodynamic and water quality modelling (CE-QUAL-W2) to evaluate the effects of cold-water releases from upstream reservoirs (Ross, Diablo, and Gorge lakes) on water temperatures in the Skagit River downstream of Gorge Dam. Northwest Hydraulic Consultants (2023).

Bridge River Water Use Plan, BC, Canada
Field observations and numerical modelling (CE-QUAL-W2) to investigate the potential effects of changes in reservoir operation on turbidity and primary productivity in a glacier-fed hydroelectric reservoir. University of British Columbia in collaboration with Limnotek Research and Development, BC Hydro, and St'át'imc Eco Resources (2016–2018).

Site C Fish Habitat Mitigation, BC, Canada
Hydrodynamic modelling (Telemac-2D) of four reaches on the Peace River downstream of the Site C Hydroelectric Project. The modelling provided information required to evaluate the conceptual design of in-stream channel works for improving fish habitat in side-channels downstream of the dam. Northwest Hydraulic Consultants (2016).

Dam-Break Inundation Study for Proposed Hydroelectric Facility, Peru
Dam-break modelling (Telemac-2D) for a proposed 115-m tall hydroelectric dam on the Marañon River, the main stem of the Amazon River. The modelling provided data for flood-inundation and flood-hazard mapping to evaluate the consequences of a potential dam failure and to support emergency response planning. Northwest Hydraulic Consultants (2015).

George Massey Tunnel Replacement Project, BC, Canada
Hydrodynamic and morphodynamic modelling (Telemac-3D) of the lower Fraser River to evaluate the effects of the proposed removal of the George Massey Tunnel on the hydraulic and sedimentation conditions in the study area. Northwest Hydraulic Consultants (2015).

Marina Floating Breakwater, BC, Canada
Conceptual design of a floating breakwater for a marina expansion. The project included a site survey, wind and wave data analysis, two-dimensional wave generation modelling (SWAN), and floating breakwater attenuator sizing. Northwest Hydraulic Consultants (2014).

Smoothed Particle Hydrodynamics applied to river ice jams
Adapted an existing computational fluid dynamics code, originally used for turbo-machinery applications, to model open-channel flows containing solids with applications to river ice jams. McGill University in collaboration with Andritz Hydro, Vevey, Switzerland (2011).