Daniel M. Robb

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Education

PhD, University of British Columbia, Civil Engineering (in progress) — 2016–
Advisor: Prof. Gregory A. Lawrence
Subject areas: environmental fluid mechanics, physical limnology
GPA: 93% (out of 100%)

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

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

Positions

Department of Civil Engineering, University of British Columbia
Graduate Research Assistant — 2016–

Northwest Hydraulic Consultants, Vancouver, BC, Canada
Project Engineer — 2013–2016

Andritz Hydro, Research and Development, Vevey, Switzerland
Intern (9 months), Computational Fluid Dynamics Group — 2011

Honours and Awards

NSERC Alexander Graham Bell CGS D, Doctoral Program ($105,000) — 2017
NSERC Alexander Graham Bell CGS M, Masters Program ($17,500) — 2010
NSERC Undergraduate Student Research Awards Program ($4,500) — 2009
UBC Faculty of Applied Science Graduate Award ($10,000) — 2017
McGill Provost's Graduate Fellowship ($4,500) — 2010, 2011
McGill Environmental and Climate Change Centre Grant ($2,250) — 2012

Research Interests

Fate and transport of turbid glacial inflows in lakes and reservoirs
Wind-driven upwelling in long narrow water bodies
Wave-current interaction
Mixing through shear instability

Teaching

University of British Columbia
Teaching Assistant, Environ. Fluid Mech. (CIVL 416), for G. A. Lawrence — 2020
Teaching Assistant, Fluid Mech. (CIVL 215), for G. A. Lawrence — 2017–2019

McGill University
Teaching Assistant, Hydraulic Eng. (CIVE 428), for S. J. Gaskin — 2011
Teaching Assistant, Dynamics (CIVE 206), for S. J. Gaskin — 2012

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Languages and Skills	English (native), French (fluent) Programming: Python (proficient), Matlab (proficient), C/C++ (intermediate)	
Graduate Courses	Advanced Fluid Mechanics, Fundamentals of Turbulent Flow, Computational Hydraulics, Environmental Fluid Mechanics, Advanced Geophysical Fluid Dynamics, Applied Mathematics, Numerical Methods, Estuary Hydraulics, Physical Limnology	
Additional Courses	Turbulence and Mixing. L. Armi (Scripps) and G. Lawrence (UBC)	2019
	Physical Limnology. B. Boehrer (UFZ). Magdeburg, Germany	2019
	Gerhard Jirka Summer School On Environmental Fluid Mechanics	2012
Professional Affiliations	Engineers and Geoscientists of British Columbia P.Eng., Licence (43785)	

Publications

Refereed Journal Articles

1. Robb, D. M., Pieters, R., & Lawrence, G. A. (2021). Fate of turbid glacial inflows in a hydroelectric reservoir. *Environmental Fluid Mechanics*. https://doi.org/10.1007/s10652-021-09815-4
2. 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.

Conferences

3. Kaminski, A. K., Olsthoorn, J., Robb, D. M., & D'Asaro, E. A. (2019). Overturning Structures in Symmetric and Asymmetric Shear Instabilities. Bulletin of the American Physical Society. In *72nd Annual Meeting of the APS Division of Fluid Dynamics*. Seattle, Washington.
4. Robb, D. M., Tedford, E. W., & Lawrence, G. A. (2019). Wave-current interaction in a laboratory flume: an analogue of the Hawking effect. Bulletin of the American Physical Society. In *72nd Annual Meeting of the APS Division of Fluid Dynamics*. Seattle, Washington.
5. Robb, D. M., Pieters, R., & Lawrence, G. A. (2019). Glacial inflows and stratification in a hydroelectric reservoir. In *22nd Workshop on Physical Processes in Natural Waters*. Yichang, China.
6. Robb, D. M., Pieters, R., & Lawrence, G. A. (2018). Effects of hydropower operation on turbidity in a glacially-fed reservoir. In *21st International Workshop on Physical Processes in Natural Waters*. Solothurn, Switzerland.
7. Robb, D. M., Pieters, R., & Lawrence, G. A. (2018). The effect of hydropower operation on turbidity in a fast-flushing reservoir. In *8th International Symposium on Environmental Hydraulics*. University of Notre Dame, Notre Dame, Indiana.
8. Robb, D. M., Gellis, M. S., Vasquez, J. A., & Wang, E. C. (2017). Tunnel replacement project: morphodynamic modelling of trench migration. In *23rd Canadian Hydrotechnical Conference*.
9. Robb, D. M., & Vasquez, J. A. (2015). Numerical simulation of dam-break flows using depth-averaged hydrodynamic and three-dimensional CFD models. In *22nd Canadian Hydrotechnical Conference*.
10. Neuhauser, M., Leboeuf, F., Marongiu, J.-C., Parkinson, E., & Robb, D. M. (2014). Simulations of rotor-stator interactions with SPH-ALE. In *Advances in Hydroinformatics*. (pp. 349–361). Springer.

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Selected Project Experience

Bridge River Water Use Plan — Assessing the link between reservoir operation and primary productivity. Field observations and numerical modelling were undertaken to understand the potential effects of changes in reservoir operation on turbidity and primary productivity in a glacially-fed hydroelectric reservoir. University of British Columbia (2015–2018).

Fish Habitat Mitigation, Canada — Hydrodynamic modelling (Telemac-2D) of four reaches on the Peace River downstream of the proposed Site C Project. The modelling provided information required to evaluate the conceptual design of in-stream channel works for improving fish habitat in side-channel areas downstream of the project. Northwest Hydraulic Consultants (2015).

Dam-Break and Inundation Study for 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 dam failure and to support emergency response planning. Northwest Hydraulic Consultants (2015).

George Massey Tunnel Replacement Project, Canada — Modelling engineer responsible for the hydrodynamic-morphodynamic modelling (Telemac-3D / Sisyphe) of a reach on the lower Fraser River containing the George Massey Tunnel. The purpose of the modelling was to evaluate the effects of the proposed removal of the tunnel on the hydraulic conditions and sedimentation patterns in the study area. Northwest Hydraulic Consultants (2014).

Iowa Hill Pumped Storage Project, California — CFD modelling (OpenFOAM) of an inlet/outlet structure for a proposed pumped storage facility. Northwest Hydraulic Consultants (2014).

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

Toba Montrose Hydroelectric Project: Montrose Coanda Screen Testing, Canada — Project engineer for test section (physical model) used to test five different Coanda screens with different designs. The purpose of the testing was to evaluate the effects of various design parameters (slot spacing, wire size, wire tilt angle, and screen wear) on the hydraulic capacity, sediment exclusion, and debris exclusion of the different Coanda screens. Northwest Hydraulic Consultants (2013–2014).

Nine Mile Hydroelectric Project: Sediment Bypass Improvements, Washington — Project engineer for a 1:30 scale, mobile-bed physical hydraulic model study. The project aimed to reduce the volume of sediment passing through the powerhouse intakes by evaluating various design alternatives including modifications to an existing sediment bypass tunnel. Northwest Hydraulic Consultants (2013).

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