Daniel M. Robb

University of British Columbia Email: drobb@eoas.ubc.ca

Education

PhD, University of British Columbia, Civil Engineering, (in progress) 2016–Present
Advisor: Prof. Gregory A. Lawrence
Co-Advisor: Dr. Roger Pieters
Subject areas: environmental fluid mechanics, physical limnology

MSc, 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

BASc, University of British Columbia, Civil Engineering, 2010

Positions

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

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

Andritz Hydro, Research and Development, Vevey, Switzerland
Intern, Computational Fluid Dynamics Group, Feb-Jul 2011, Mar-Jun 2012

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

Effects of hydropower operation on water quality
Effects of glacial inflows on the light regime in lakes and reservoirs
Mixing through shear instability
Wave-current interaction

Teaching

University of British Columbia
Teaching Assistant, Fluid Mechanics (CIVL 215), for Prof. G. A. Lawrence, 2017–2018

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

Languages and Skills

English (native), French (fluent)
Programming: Python (proficient), Matlab (proficient), C/C++ (intermediate)

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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	Gerhard Jirka Summer School On Environmental Fluid Mechanics, 2012 Lecturers: G.S. Constantinescu, P.A. Davies, D. Etling, G.A. Lawrence, J. H.W. Lee, H.M. Nepf, V.I. Nikora, F. Porté-Agel, A.J. Wüest
Professional Affiliations	Engineers and Geoscientists of British Columbia P.Eng., Licence (43785)

Publications

In Preparation

1. Robb, D. M., Pieters, R., & Lawrence, G. A. (2019). Stratification and turbid inflows in a hydroelectric reservoir.

Refereed Journal Articles

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.

Conference Proceedings

3. 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.
4. 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.
5. 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*. Vancouver, BC.
6. Vasquez, J. A., & Robb, D. M. (2016). Modelación CFD de rotura de presas en presencia de obstáculos. In *XXVII Congreso Latinoamericano de Hidráulica (IAHR)*. Lima, Peru.
7. 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*. Montreal, QC.
8. 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.
9. Henscheid, P. J., Hughes, B. H., Schwall, D., Robb, D. M., & Hurtig, K. I. (2014). Nine Mile Dam–Sediment Bypass Tunnel Rehabilitation. In *HydroVision International*. Nashville, TN.
10. Robb, D. M., Gaskin, S. J., Marongiu, J.-C., & Villeneuve, M. (2013). Smoothed particle hydrodynamics simulations of freely moving solid objects in a free-surface flow with applications to river ice dynamics. In *21st Canadian Hydrotechnical Conference*. Banff, AB.

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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).

Dam-Break and Inundation Study for Hydroelectric Facility, Peru. Dam-break modelling (Telemac-2D) for a proposed >100-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).

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).

Iowa Hill Pumped Storage Project – Slab Creek Reservoir Inlet/Outlet Structure CFD Modelling, Iowa Hill, California. CFD modelling (OpenFOAM) of an inlet/outlet structure for a proposed pumped storage facility. 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).