# Dr. Andrew Binns

- Assistant Professor, Water Resources Engineering, School of Engineering, University of Guelph
- binns@uoguelph.ca

Dr. Andrew Binns is an Assistant Professor in the School of Engineering at University of Guelph. Dr. Binns conducts research related to fluvial processes in surface water systems, and the effects of natural and anthropogenic impacts to these systems. His primary focus has been the investigation of fluvial morphodynamic process in rivers and streams. Research projects include investigating the nature of bed and planform morphological development in meandering streams, quantifying the effects of unsteady flow events on sediment transport rates, identifying optimal stream restoration designs for degraded fluvial systems, and assessing the relationship between land-use and flooding.

Research interests:
- Water resources engineering and environmental hydraulics
- Fluvial hydraulics, sediment transport and river morphology
- Stream restoration and rehabilitation
- Stormwater management, flood forecasting and urban hydrology
- Lake hydrodynamics
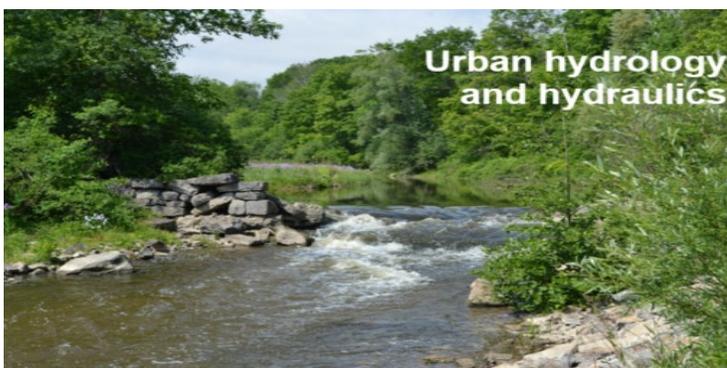
Assessment of Contaminant Transport in Riverine Systems

He was a postdoctoral fellow in the Department of Integrative Biology at the University of Guelph (interdisciplinary study of the influence of lake hydrodynamics on patterns of distribution and abundance of fish larvae). Dr. Binns completed his PhD in civil engineering at Queen's University (nature and time-scale of bed development of alluvial streams).
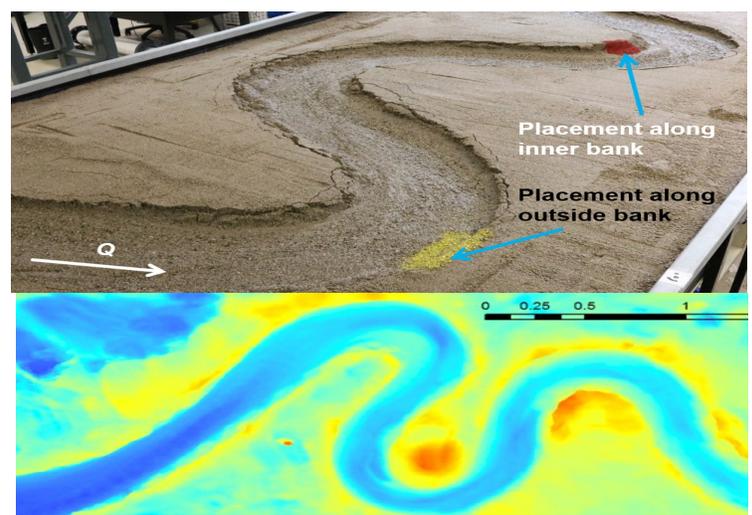
Types of Applicable Environments

Selected Papers

Selected Publications

Dusolt, S., Binns, A.D., McBean, E.A., Gharabaghi, B., Sandink, D. Characterization of backwater valves in sanitary sewer laterals and associated failures in a Canadian context. Accepted to Canadian Journal of Civil Engineering.

Jiang, A., McBean, E.A., Binns, A.D., Gharabaghi, B. Guidance on field survey program design for basement flooding assessments. Accepted to Hydrological Sciences Journal.

Walls, S.A., Binns, A.D., Levison, J.K., MacRitchie, S. Prediction of actual evapotranspiration by artificial neural network models using data from a Bowen Ratio energy balance station. Accepted to Neural Computing and Applications.

Khosravi, K., Chegini, A.H.N., Cooper, J.R., Daggupati, P., Binns, A.D., Mao, L. Uniform and graded bed-load sediment transport in a degrading channel with non-equilibrium conditions. Accepted to International Journal of Sediment Research.

Rixon, S., Levison, J.K., Binns, A.D., Persaud, E. Spatiotemporal variations of nitrogen and phosphorus in a clay plain hydrological system in the Great Lakes Basin. Science of the Total Environment, 714, 136328, 12 pages, 2020.

Khosravi, K., Chegini, A.H.N., Binns, A.D., Daggupati, P., Mao, L. Difference in the bed load transport of graded and uniform sediments during floods: an experimental investigation. Hydrology Research, 50(6), 1645-1664, 2019.

Walton, R., Binns, A.D., Bonakdari, H., Ebtehaj, I., Gharabaghi, B. Estimating 2-year flood flows using the generalized structure of the group method of data handling. Accepted to Journal of Hydrology.

Jiang, A., McBean, E.A., Binns, A.D., Gharabaghi, B. Quantifying rainfall-derived infiltration and inflow by residential downspouts in sanitary sewers: a case study in London, Ontario, Canada. Accepted to Journal of Hydrologic Engineering.

Bonakdari, H., Zaji, A.H., Binns, A.D., Gharabaghi, B. Integrated Markov chains and uncertainty analysis techniques to more accurately forecast floods using satellite signals. Journal of Hydrology, 572, 75-95, 2019.

Binns, A.D., Fata, A., da Silva, A.M.F., Bonakdari, H., Gharabaghi, B. Modelling performance of sediment control wet ponds at two construction sites in Ontario, Canada. Journal of Hydraulic Engineering, 145(4), 1-12, 2019.

Milukow, H.A., Binns, A.D., Adamowski, J., Bonakdari, H., Gharabaghi, B. Estimation of the Darcy-Weisbach friction factor for ungauged streams using Gene Expression Programming and Extreme Learning Machines. Journal of Hydrology, 568, 311-321, 2019.

Shaghaghi, S., Bonakdari, H., Gholami, A., Kisi, O., Binns, A.D., Gharabaghi, B. Predicting the geometry of regime rivers using M5 model tree, multivariate adaptive regression splines and least square support vector regression methods. International Journal of River Basin Management, 1-20, 2018.

Shaghaghi, S., Bonakdari, H., Gholami, A., Kisi, O., Shiri, J., Binns, A.D., Gharabaghi, B. Stable alluvial channel design using evolutionary neural networks. Journal of Hydrology, 566, 770-782, 2018.

Vrban, S., Wang, J., McBean, E.A., Binns, A.D., Gharabaghi, B. Evaluation of stormwater infrastructure design storms developed using partial duration and annual maxima series models. Journal of Hydrologic Engineering, 23(12), 1-11, 2018.

Irwin, S., Howlett, C., Binns, A.D., Sandink, D. Mitigation of basement flooding due to sewer backup: overview and experimental approach to investigate the performance of backwater valves. Accepted to Natural Hazards Review.

McKee, J.L., Binns, A.D., Helsten, M., Shifflett, M. Evaluation of gauge-radar merging methods using a semi-distributed hydrological model in the Upper Thames River basin, Canada. Accepted to Journal of the American Water Resources Association.

McNeill, K., Macdonald, K., Singh, A., Binns, A.D. Food and water security: analysis of integrated modeling platforms. Agricultural Water Management, 194, 100-112, 2017, doi: 10.1016/j.agwat.2017.09.001.

Gunsolus, E.H., Binns, A.D. Effect of morphologic and hydraulic factors on hysteresis of sediment transport rates in alluvial streams. River Research and Applications, 34, 183-192, 2018, doi: https://doi.org/10.1002/rra.3184.

McKee, J.L., Binns, A.D. A review of gauge-radar merging methods for quantitative precipitation estimation in hydrology. Canadian Water Resources Journal, 41(1-2), 186-203, 2016, doi: 10.1080/07011784.2015.1064786.

Binns, A.D., da Silva, A.M.F. Meandering bed development time: formulation and related experimental testing. Advances in Water Resources, 81, 152-160, 2015, doi:10.1016/j.advwatres.2014.11.007.

He, C., Scott, E., Graham, M., Binns, A.D. Measurement and numerical modeling studies of the highest bottom shear stress in the Randle Reef area. Canadian Journal of Civil Engineering, 41(9), 828-838, 2014.

Selected Conference Papers

Martin, E.M., Binns, A.D., Newson, T. Morphodynamic response of Lower Spencer Creek to large precipitation events and channel modifications. Accepted to CSCE (Canadian Society for Civil Engineering) 2018 Annual Conference, 13-16 June, Fredericton, Canada, 2018.

McNeill, K.S., Singh, A., Binns, A.D. Flood history analysis and socioeconomic implications of flooding for indigenous Canadian communities. In Proceedings of CSBE/SCGAB (Canadian Society for Bioengineering) Annual General Meeting and Technical Conference, 6-10 August, Winnipeg, Canada, 2017.

Gunsolus, E.H., Binns, A.D. Effect of hydrograph shape on the morphological response of alluvial stream beds. In Proceedings of 8th International Conference on Fluvial Hydraulics – River Flow 2016, 12-15 July, St. Louis, Missouri, USA, 2016.