

**Assessment of groundwater discharge pathways in a till-dominated coastal aquifer – A case study on Mabou Harbour, Cape Breton Island, NS**

presented by Ray Craddock  
November 30<sup>th</sup> at 12 pm AST.

Ray Craddock is a geoscientist in training with BGC Engineering. He holds an M.A.Sc. in Civil and Resource Engineering, with a focus on hydrogeology, from Dalhousie University. Ray joined BGC Engineering in February 2021 and has been involved in mine-related hydrogeology projects primarily in British Columbia and Ontario.

**Abstract:**

Understanding the pathways facilitating groundwater flow and associated solute transport to the ocean is key for developing conceptual hydrogeologic models for coastal watersheds and for informing coastal zone management. Most local-scale field and modeling submarine groundwater discharge (SGD) studies have been conducted in high-permeability coastal aquifers given the likely importance of SGD in these coastal settings. The preponderance of such studies may bias our understanding of SGD dynamics across spatial scales and overemphasize the importance of SGD in coastal watersheds. This study quantifies direct (SGD) and indirect (seaward baseflow) groundwater discharge from a till dominated coastal aquifer using a combination of field measurements (river flow and baseflow separation, seepage meter measurements, and water temperature analysis) and a calibrated 3D numerical groundwater flow model. Results show that seaward baseflow greatly exceeds direct SGD to the ocean on the scale of the full harbour watershed (96.1% vs. 3.9). Particle tracking shows that the vast majority of SGD originates in the subcatchment immediately surrounding the harbour with limited intermediate or regional flow. The short flow paths for SGD may have implications for groundwater-borne contamination to this harbour.

This work was recently published in the [Journal of Hydrology: Regional Studies](#)

Join Zoom Meeting

<https://us02web.zoom.us/j/82499792758?pwd=VEY2Y3R2L1pCQU9aK01yRE56UTdhUT09>

Meeting ID: 824 9979 2758

Passcode: 050001