

# **The Viability of Natural Channel Designs in Highly Active Fluvial Systems**

**Scott Cowan<sup>1</sup>,  
Jeff Muirhead<sup>1</sup>,**

*<sup>1</sup>Stantec Consulting Ltd., Waterloo, Canada*

Geomorphic processes have the potential to impact infrastructure projects near active watercourses. Conversely, infrastructure projects have the potential to impact geomorphic processes upstream and downstream of the project location. When these development projects become compromised by geomorphic processes, the cost of rebuilding and/or moving the infrastructure can be significant. As a result, there is a significant financial benefit in considering fluvial geomorphology during the infrastructure planning phase. In situations where fluvial geomorphology hasn't been incorporated and/or conditions have changed, natural channel design can be an economically favourable alternative for dealing with the infrastructure issues at hand. However, is natural channel design always the best approach?

This presentation will explore three case studies in western Canada where highly active watercourses threatened existing infrastructure. In each of these cases the proponent was interested in investigating mitigation alternatives, including natural channel designs, that did not require rebuilding and/or moving the infrastructure.

For each site, a detailed geomorphic assessment was completed. Using the results of the geomorphic assessment, the long-term viability of several mitigation options was evaluated from economic, environmental, and public safety perspectives. The results of the analysis illustrate the value of completing a geomorphic analysis during the planning phase. The results also demonstrate that mitigating compromised infrastructure with a natural channel design, although effective in many applications, can have limited success in highly active systems or when implemented too late in the process.

## **Biography**

Scott is a Fluvial Geomorphologist at Stantec Consulting Ltd. specializing in the practical application of fluvial geomorphology including natural channel design, geomorphic baseline assessment, and riverine hazard assessment. Scott has worked on stream assessment and restoration design projects in a variety of environments across Canada.