

# **Limitations and Misuse of the Rapid Geomorphic Assessment for Preliminary Characterization of Channel Stability**

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The Rapid Geomorphic Assessment (RGA) is a tool developed by the Ontario Ministry of the Environment for making preliminary evaluations of channel stability and sensitivity to an alteration in the sediment-flow regime. The RGA is used extensively in southern Ontario, commonly by or for Conservation Authorities, yet its limitations are routinely overlooked and misuse is widespread. Inconsistent results may be contributing to the mismanagement of stormwater and erosion control measures.

Using examples from southern Ontario, we demonstrate that the appropriate use of the RGA requires awareness of three key limitations. First, the calculated values of its four form/process indices (i.e., AI, DI, WI and PI) are biased by inconsistent weighting (relative importance) of geomorphic indicators according to their presence, absence or inapplicability. Second, the calculation of its stability index (SI) allows for the contradictory concurrence of aggradation and degradation. Third, the subjectivity of the RGA necessitates careful calibration of practitioners' documentation of field indicators in order to facilitate reliable comparisons of channel stability in different reaches or at different times.

Inadvertent misuse of the RGA also leads to erroneous results in three main ways, as demonstrated through recent project review experience. First, application of the RGA to small (swale) headwater drainage features, non-alluvial (bedrock) channels, or even natural (undisturbed) meandering streams can lead to spurious results. Second, the assessment of evidence of planimetric form adjustment is intended to detect transitions from one channel pattern (e.g., meandering) to another (e.g., braided), for consistency with assessment of the other three form/process indices, yet it is commonly misapplied to document evidence of regular meander processes along a dynamically stable channel. Third, the checklist-style format tends to lead to over-assignment of indicators of instability and an inaccurate stability index, particularly for users untrained and inexperienced in fluvial geomorphology. Professional judgment is essential to validate the results of the RGA. Clarifications and refinements for improving the reliability of the RGA are proposed.