



Geomorphic Analysis Package

Description

This research effort will focus on the development of an automated tool package to aid users in common analyses required for assessing geomorphic changes in inland systems. The first phase of this effort will be the development of a specific gage analysis tool, which will be the initial component of a broader geomorphic assessment tool package.



Figure 1: Example specific gage record developed for Red River Landing at various flows using the rating curve and direct step methods

Issue/Challenge To Address

One of the most common tools used to assess the historical stability of a river system is the specific gage record. Specific gage analysis is often used to detect changes in channel regime and can aid in the determination of sediment related issues occurring in a watershed. A specific gage record is developed by plotting curves of stage for a specific discharge (at a particular gaging location) against time. Generally, there are two methods used to develop specific gage records commonly referred to as the rating curve method and direct step method. While the development of a specific gage record is a fairly straightforward process, it can be quite time consuming depending on the method employed and the size of the datasets. The proposed tool would considerably reduce the amount of time the users would need to process data for specific gage analysis and supply statistical outputs to support users in interpreting the developed specific gage records. This tool would be considered as one component of a broader package used for assessing geomorphic changes in inland systems.

Successes Lessons Learned

Lessons learned will be compiled during the duration of this study.

Projected Benefits Cost Savings Value Added	The full development of this tool suite would allow for more cost efficient analysis of channel conditions by considerably reducing the amount of time the user needs to process data. In addition, the tool would provide the ability to expand the spatial extents of analysis with minimum effort, allowing for a more complete understanding of the system processes and interactions from a regional perspective.
Expected Products	<ul style="list-style-type: none"> • Beta Tool • Technical Note (draft within FY20)
Stakeholders/Users	Beta testing of the tool suite will include ERDC engineers as well as any regional USACE District interested in using such tools for their projects.
Leveraging Opportunities	Development of a suite of tools used for geomorphic assessments of river systems would be beneficial Corps wide. This suite of tools could be coupled with other analysis tools readily available such as Cross Section Viewer (geometric analysis), HEC-SSP (statistical analysis; frequency, duration, etc.) to provide additional resources for users to perform assessments. Incorporating more tools (specific gage, stage-discharge relationships, slope, etc.) to aid in geomorphic assessments will provide the necessary support for users to implement sound regional sediment management techniques throughout all project phases.
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Participating Partners	ERDC-CHL