# Science
BRIEFING

GEOMORPHIC CLASSIFICATION OF RIVERS

BACKGROUND

Over the last several decades, environmental legislation and a growing awareness of histori-cal human disturbance to rivers worldwide have fostered unprecedented collaboration among scientists, land managers, and stakeholders to better understand, monitor, and re-store riverine ecosystems. The additional concern over climate change and the need for se-curing supplies of clean water for the burgeoning world population have further spurred collaborative watershed analyses. In geomorphology, much of this effort focuses on as-sessing the effects of natural and anthropogenic disturbances of the landscape in order to understand past response, determine current conditions, and predict likely responses to future disturbance, including land management and restoration activities.

RESEARCH

Research Activity: Channel classi-fication is one tool that is used to address these needs. John Buffing-ton (USFS Research Geomorpholo-gist) and David Montgomery (University of Washington) devel-oped a widely used hierarchical channel classification scheme for mountain basins. Recently, they contributed a book chapter (in Shroder *et al.* 2013) reviewing the purposes of geomorphic channel classification, the different types of classification schemes that have been developed, and their use, com-patibility, and popularity, and con-clude with a look at future needs and directions for channel classification.
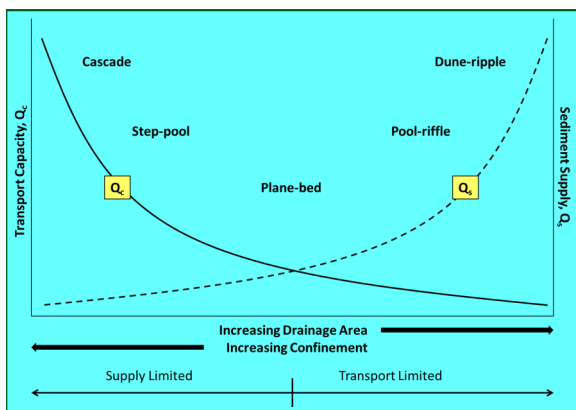

Schematic modified from Montgomery and Buffington (1997) showing a generalized trend in the spatial ar-rangement of channel types in basins, with channels becoming increasingly transport-limited as drainage area increases.

👍 KEY FINDINGS 👍

- Land management and stream restoration activities require a quantitative, process-based understanding of fluvial geo-morphology and biophysical interactions.

- Process-based channel classifi-cations impose order on the wide range of morphologies found in mountain streams based on similarities of form or function, and are one tool for addressing such problems.

- However, classification cannot substitute for field measure-ments of the physical process-es occurring within a river.

MORE INFORMATION

For more information, please contact **John Buffington**, USFS Research Geo-morphologist, (208)373-4384 or jbuff-ington@fs.fed.us
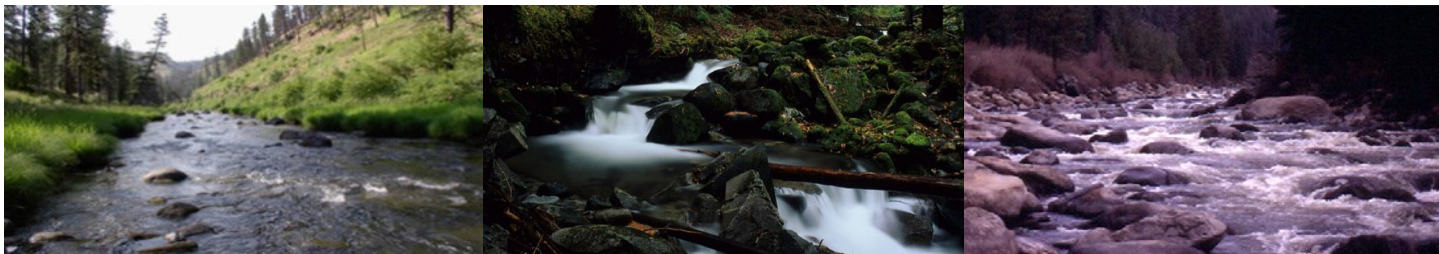
Three of the eight common stream types found in mountain basins, based on Montgomery and Buffington (1997): plane-bed (left), step-pool (middle), and cascade (right).

Keywords: *geomorphic channel classification, rivers, fluvial geomorphology, channel morphology, channel types*