riversmart communities

supporting ecologically restorative flood prevention and remediation in New England

Bankfull

When a river is full of itself.

During **bankfull** events, water fills a channel until it just spills over its banks. These happen about every 2 years, and their powerful flows maintain a channel's shape. For this reason, bankfull flow is also known as the **effective**, **dominant**, or **channel-forming** flow. The width and depth of a stream at these times – its **bankfull dimensions** – allow for meaningful comparison to other streams, and provide useful information about flow patterns.

Indicators of bankfull discharge fall into four categories:
topographical, physical, vegetative and hydrologic.

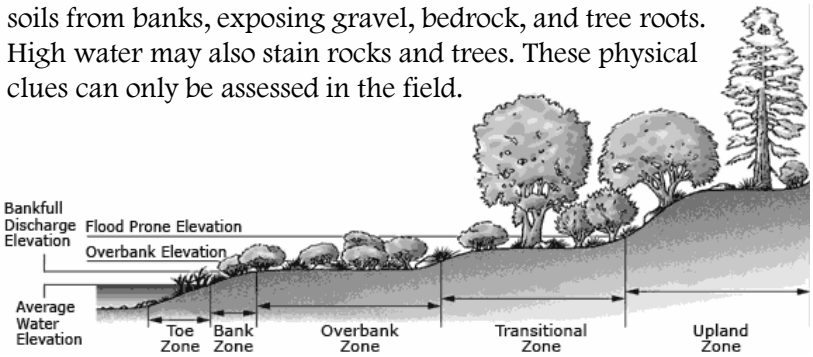
Topographical features are created when sediment is deposited in areas with slow-moving water. The tops of these features mark the height of the water at bankfull. In rivers with floodplains, the change from steep banks to flat floodplains indicate bankfull height.

Photo: TrailVoice on flickr.com

Estimating bankfull stage from depositional features.
Photo: Nicole Gillett

Most **vegetation** cannot survive within the bankfull channel. Trees and bushes often begins to establish just uphill of the channel edge. Some birches, dogwoods, and alders can be found growing near the bankfull height. Willows can survive within the bankfull channel.

Bankfull flows leave **physical** evidence. Water removes soils from banks, exposing gravel, bedrock, and tree roots. High water may also stain rocks and trees. These physical clues can only be assessed in the field.



Riparian Zones: From Hoag 1999, Hoag 2001

Bankfull flow is a **hydrologic** process that can be directly measured by stream gages. Bankfull flow and dimensions can be estimated at other areas using equations that relate those features to others, such as watershed area. These equations, known as **regional curves**, have significant errors.