

# How Streams Work

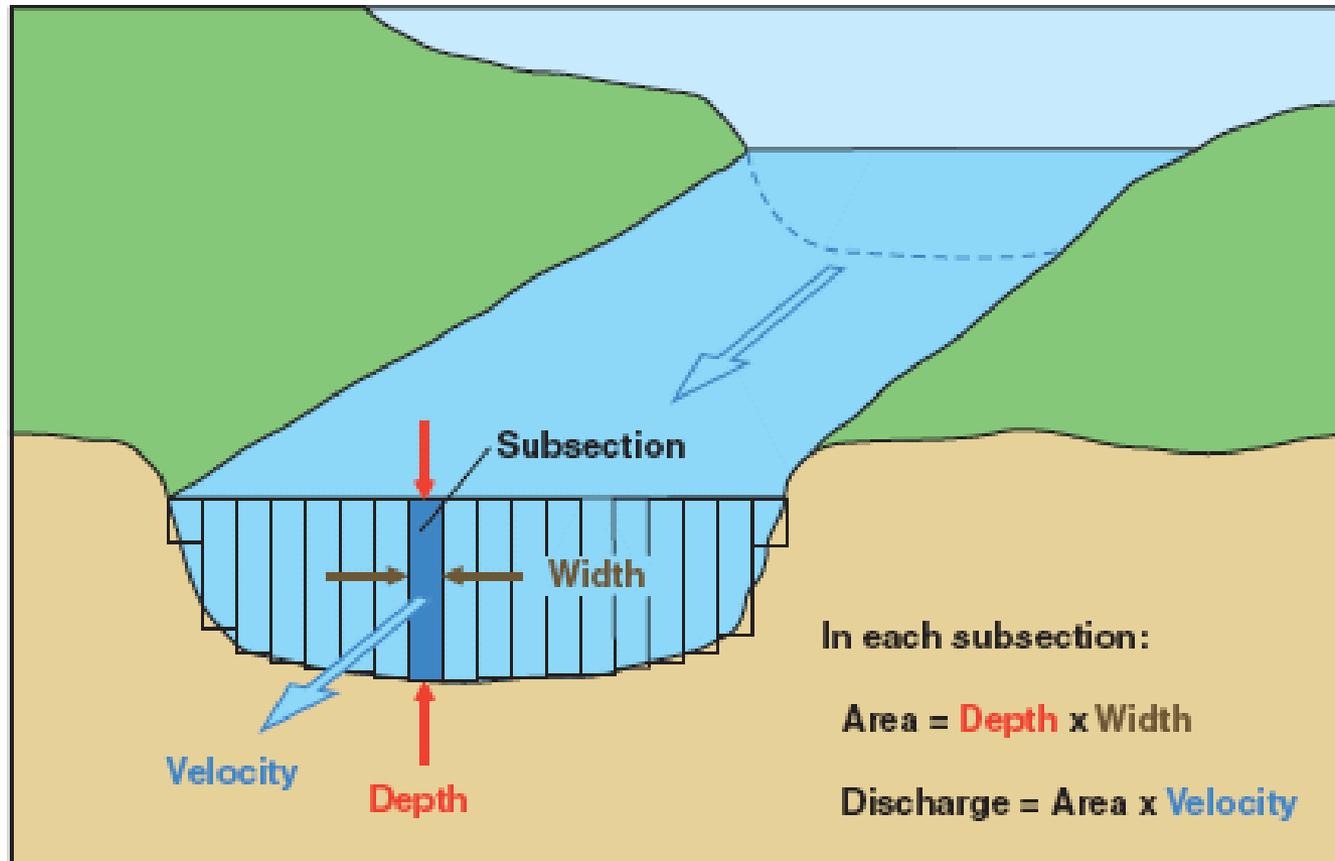


Matt Diebel

# Overview

Field	General definition	Use in this workshop	Why do I need to know this?
Hydrology	The science of the water cycle	How does flow vary over time?	Infer the behavior of streams and design crossing structures that will accommodate this behavior
Fluvial geomorphology	The science of the form and function of streams and their interaction with the landscape	What do the shape and dimensions of the stream channel and its surroundings tell us about water and sediment movement?	

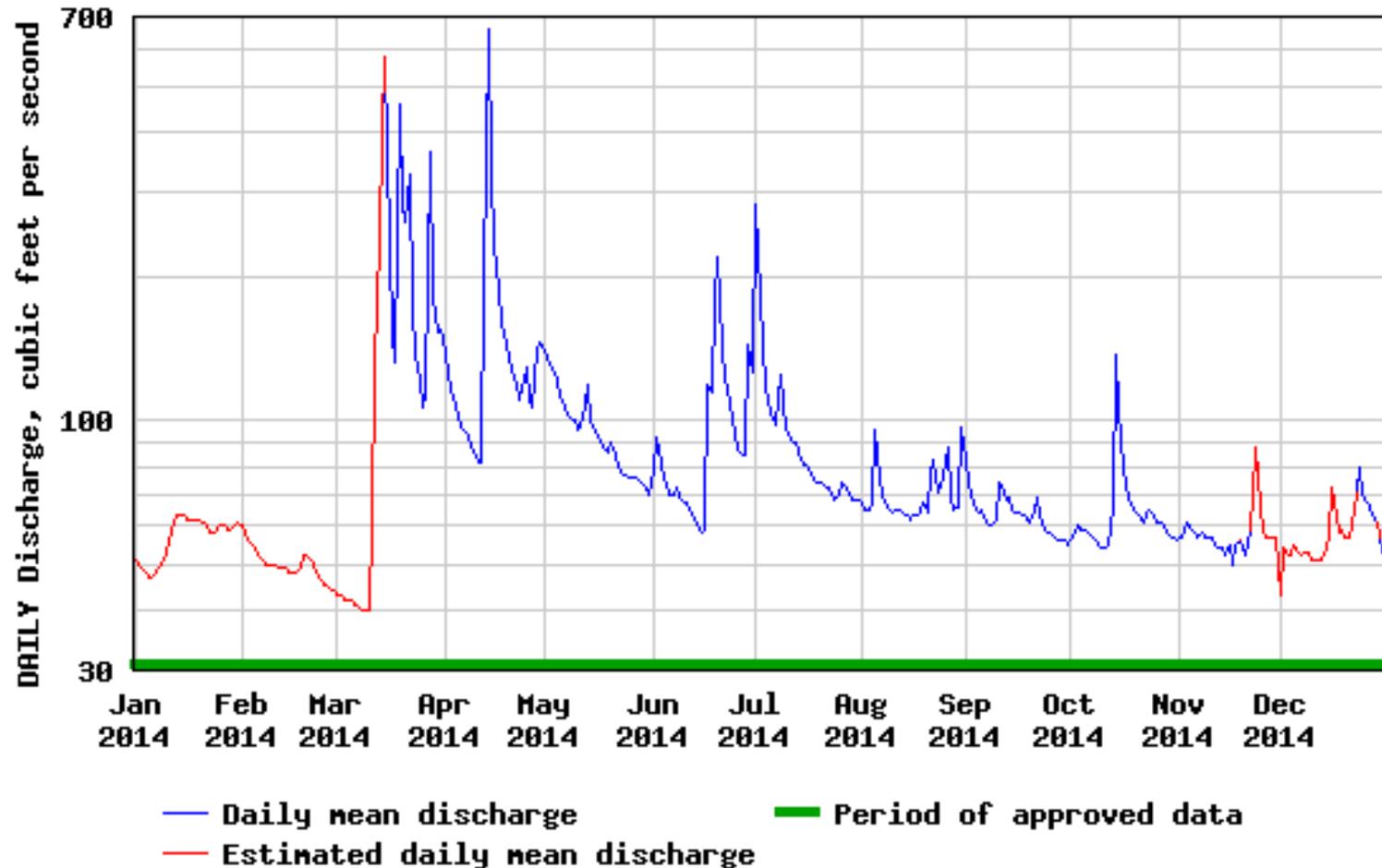
# Measuring Stream Discharge



# Stream Discharge over Time



USGS 05414000 PLATTE RIVER NEAR ROCKVILLE, WI

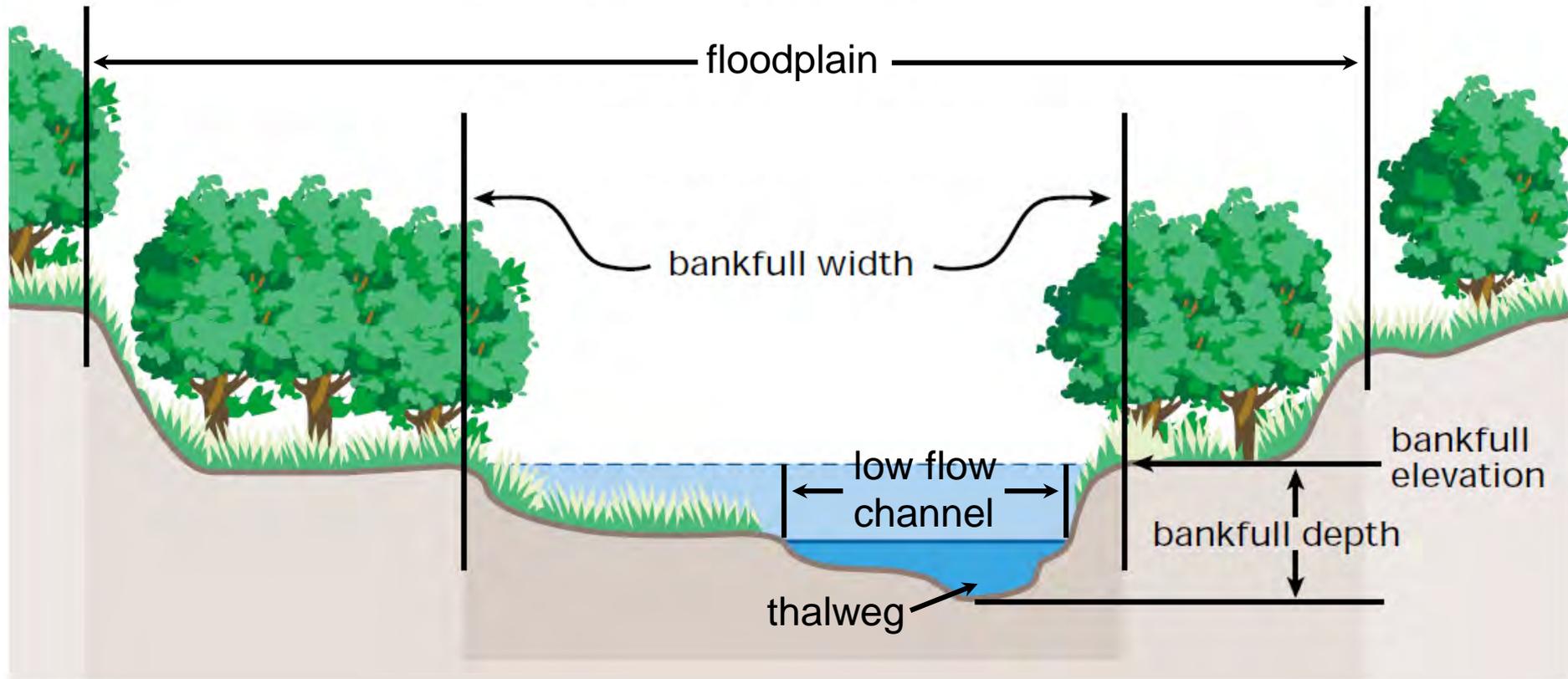


# Bankfull Discharge

- When the channel is completely full and water begins to spread onto the floodplain
- Occurs every 1.5 years on average
- Transports the most cumulative sediment over time
- Has the greatest influence on channel dimensions

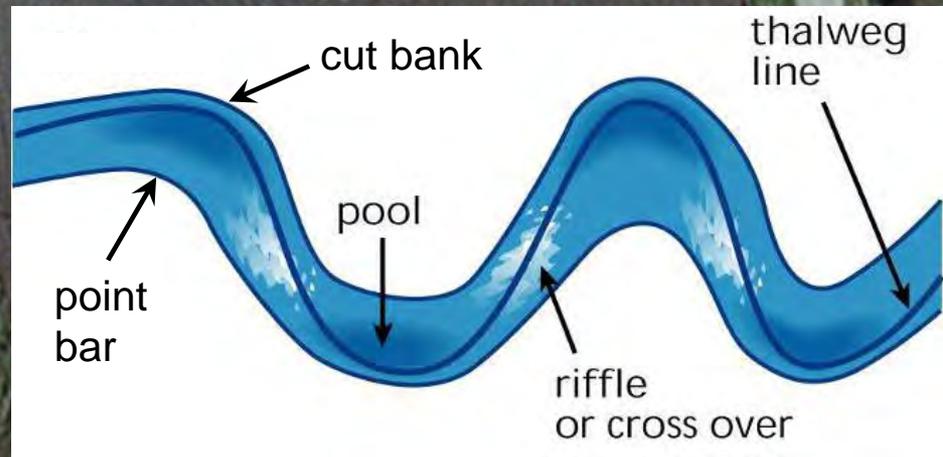


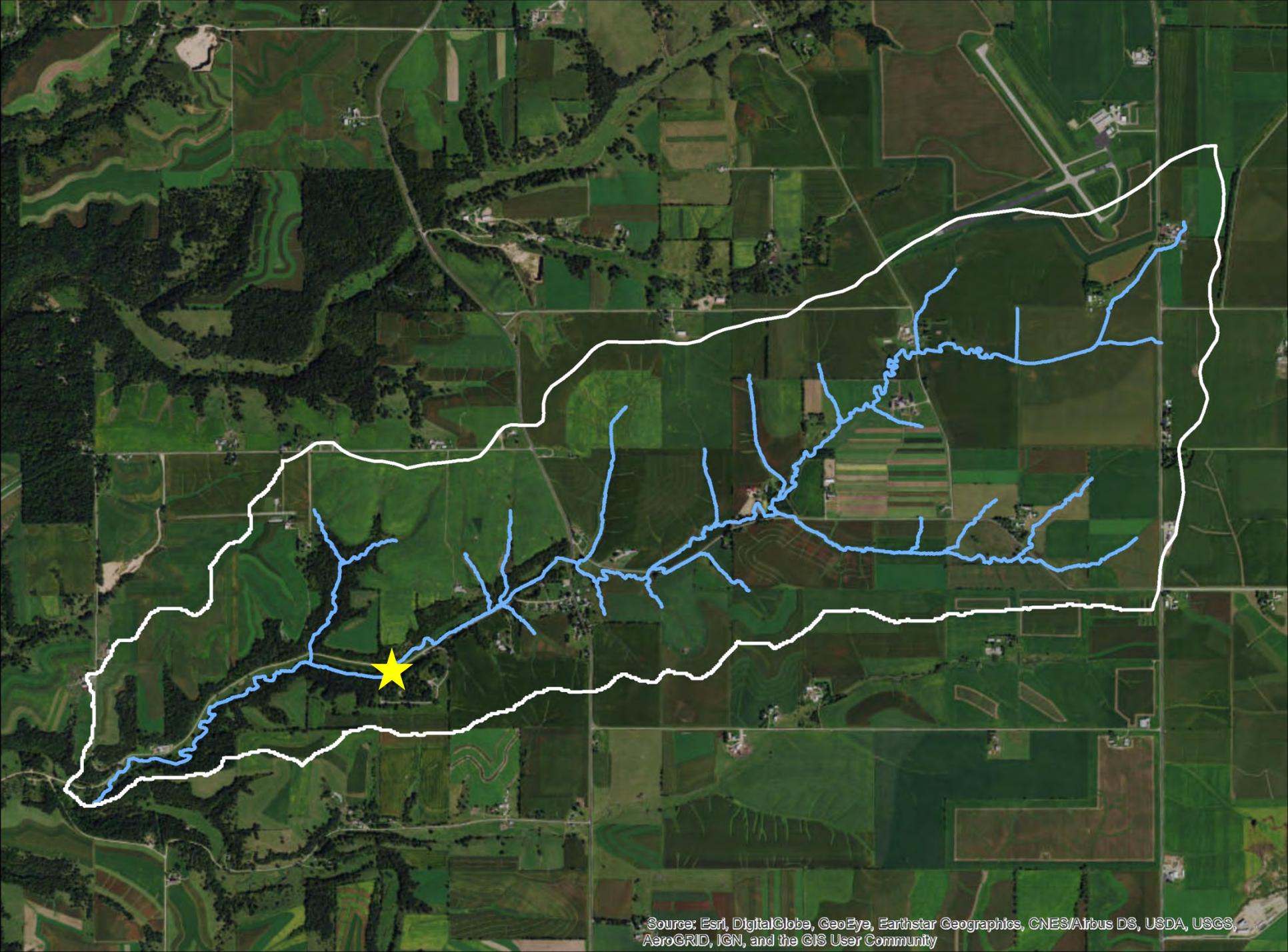
# Channel Cross Section



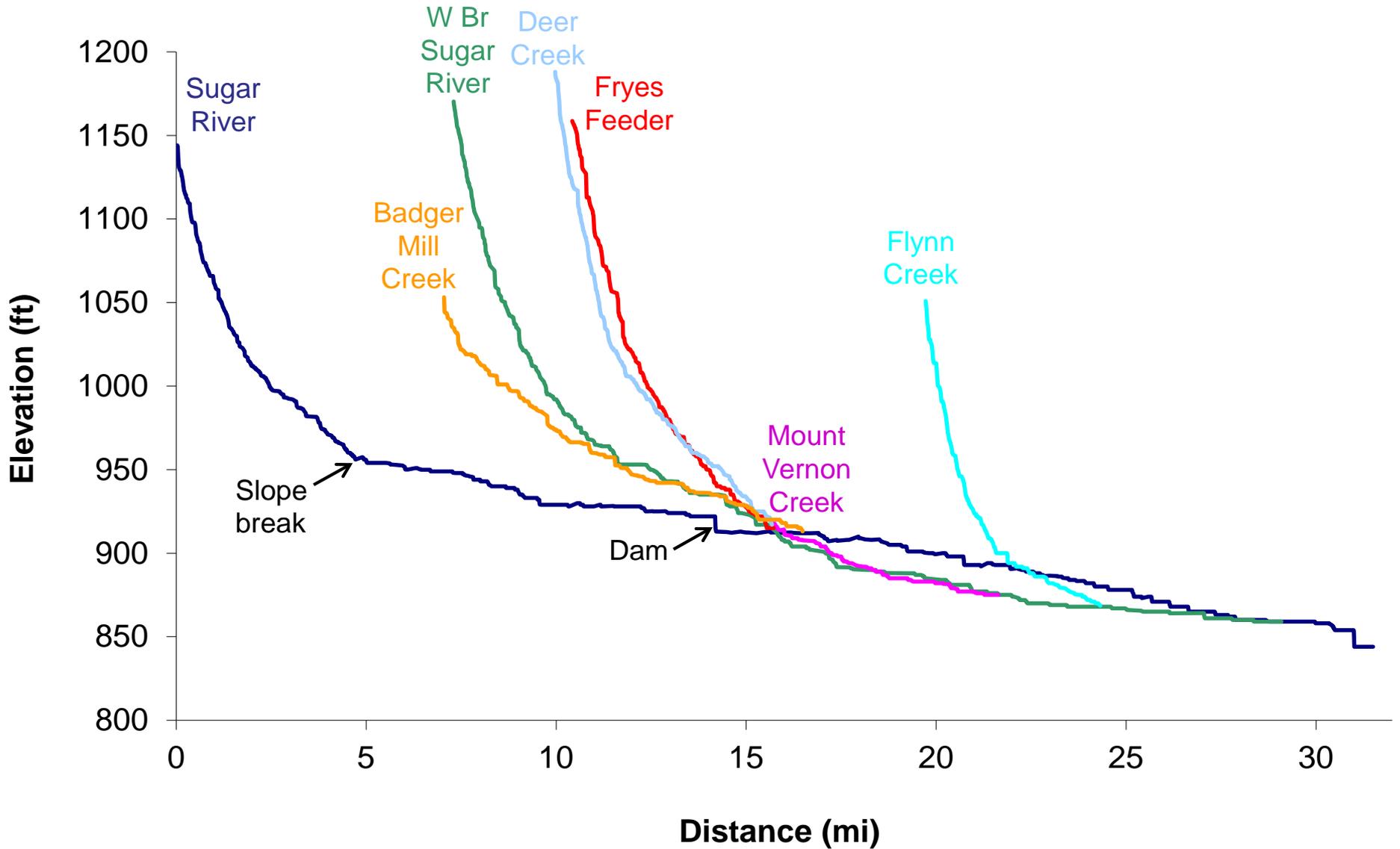
# Channel Planform

Reach  
(20-35 ×  
stream width)

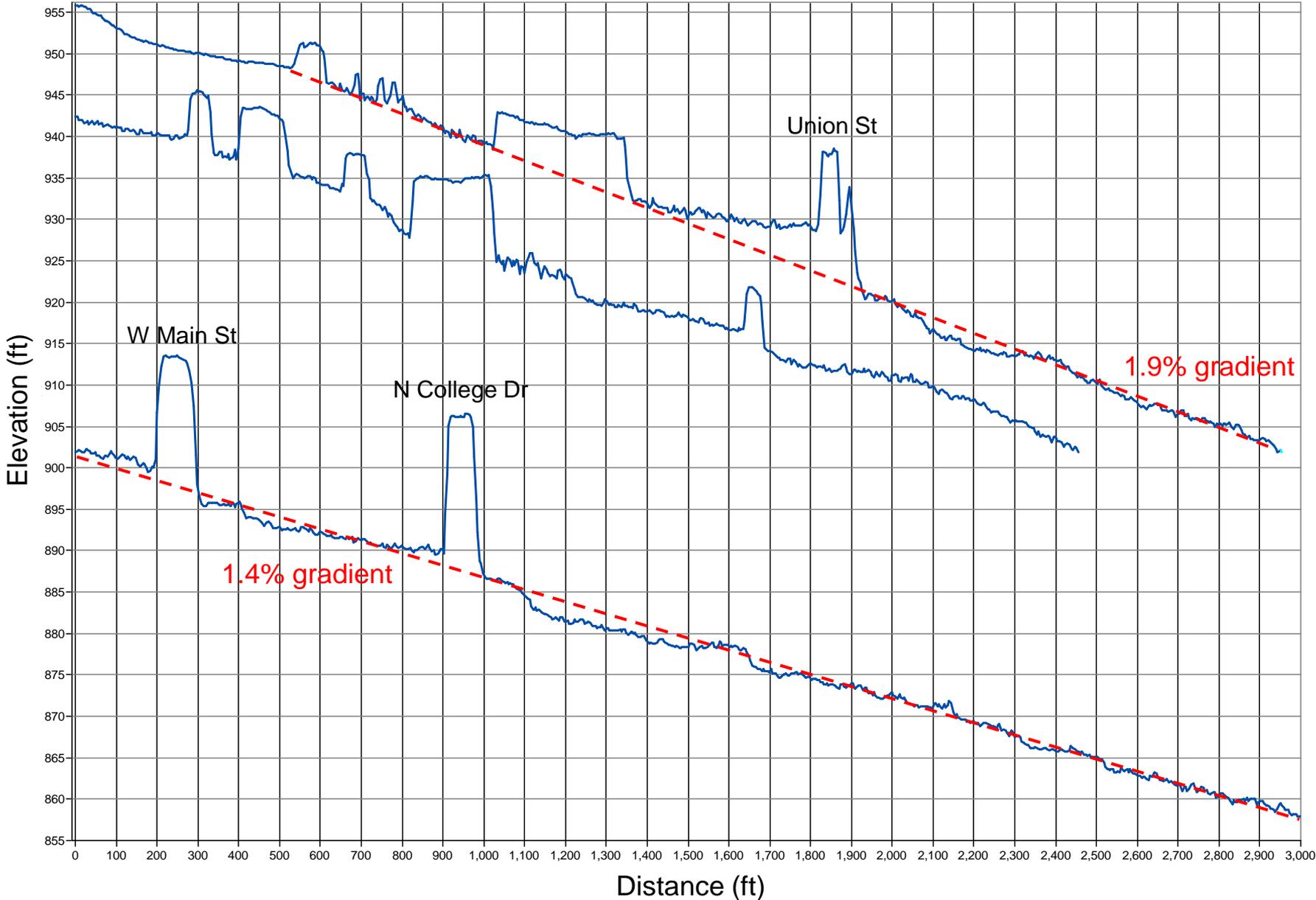




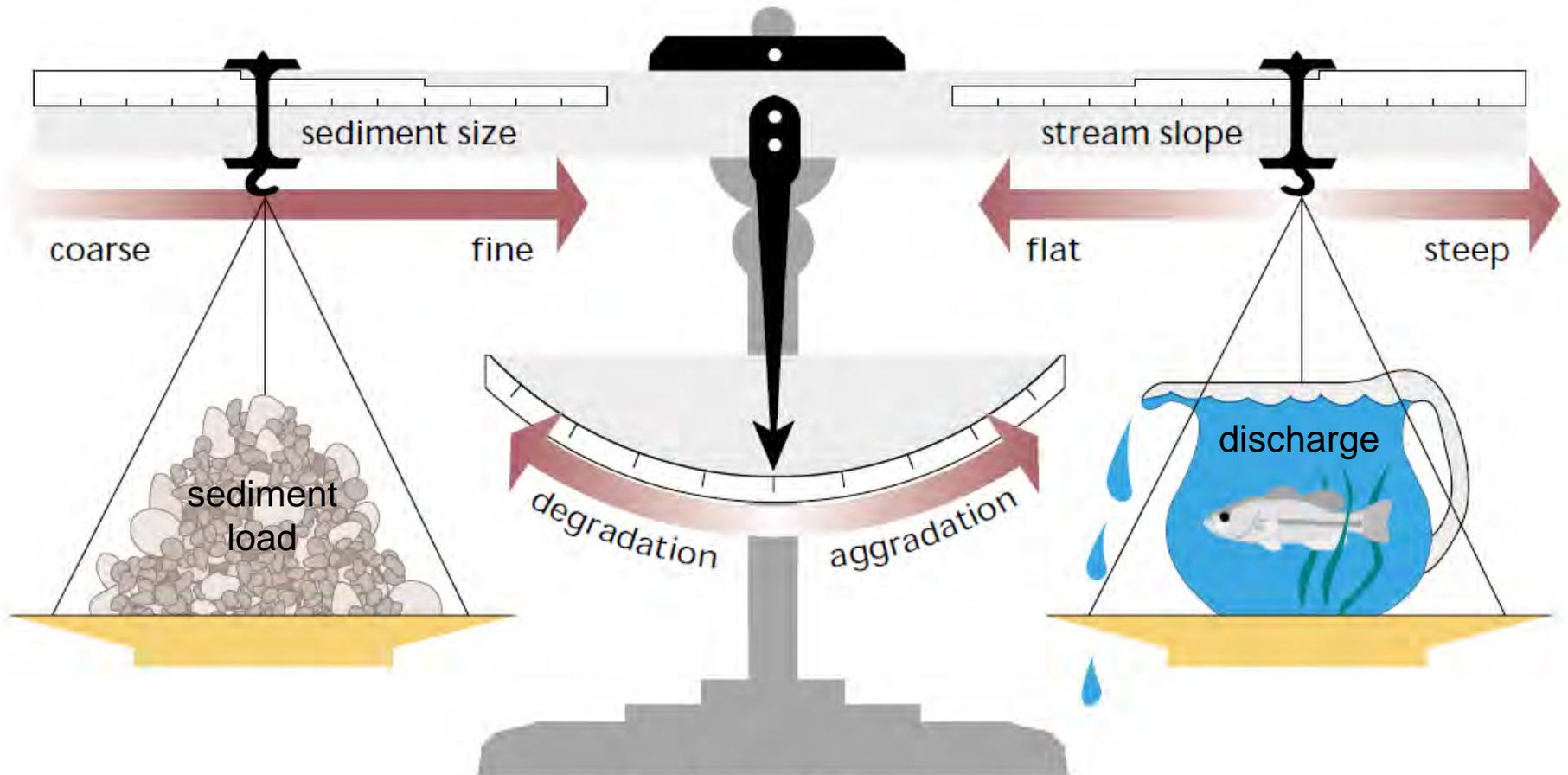
# Longitudinal Profile



# Rountree Branch Tributary



# Factors Affecting Channel Equilibrium



$$Q_s \cdot D_{50} \propto Q_w \cdot S$$

# Additional Resources

- Stream Corridor Restoration: Principles, Processes, and Practices, Federal Interagency Stream Restoration Working Group (FISRWG)
- Guide to Identification of Bankfull Stage in the Northeastern United States (USDA Forest Service General Technical Report RM-GTR-133-CD)
- US EPA's Watershed Academy Stream Corridor Structure Module:  
<http://www.epa.gov/owow/watershed/wacademy/acad2000/stream/index.html>

A man wearing a blue long-sleeved shirt, olive green cargo pants, a black beanie, and a large teal backpack stands on a muddy bank next to a river. He has his hands outstretched in a questioning gesture. A speech bubble containing the text "Questions?" is positioned above him. The background consists of dry, brushy vegetation and a muddy riverbank.

Questions?