

How Streams Work



Matt Diebel

Overview

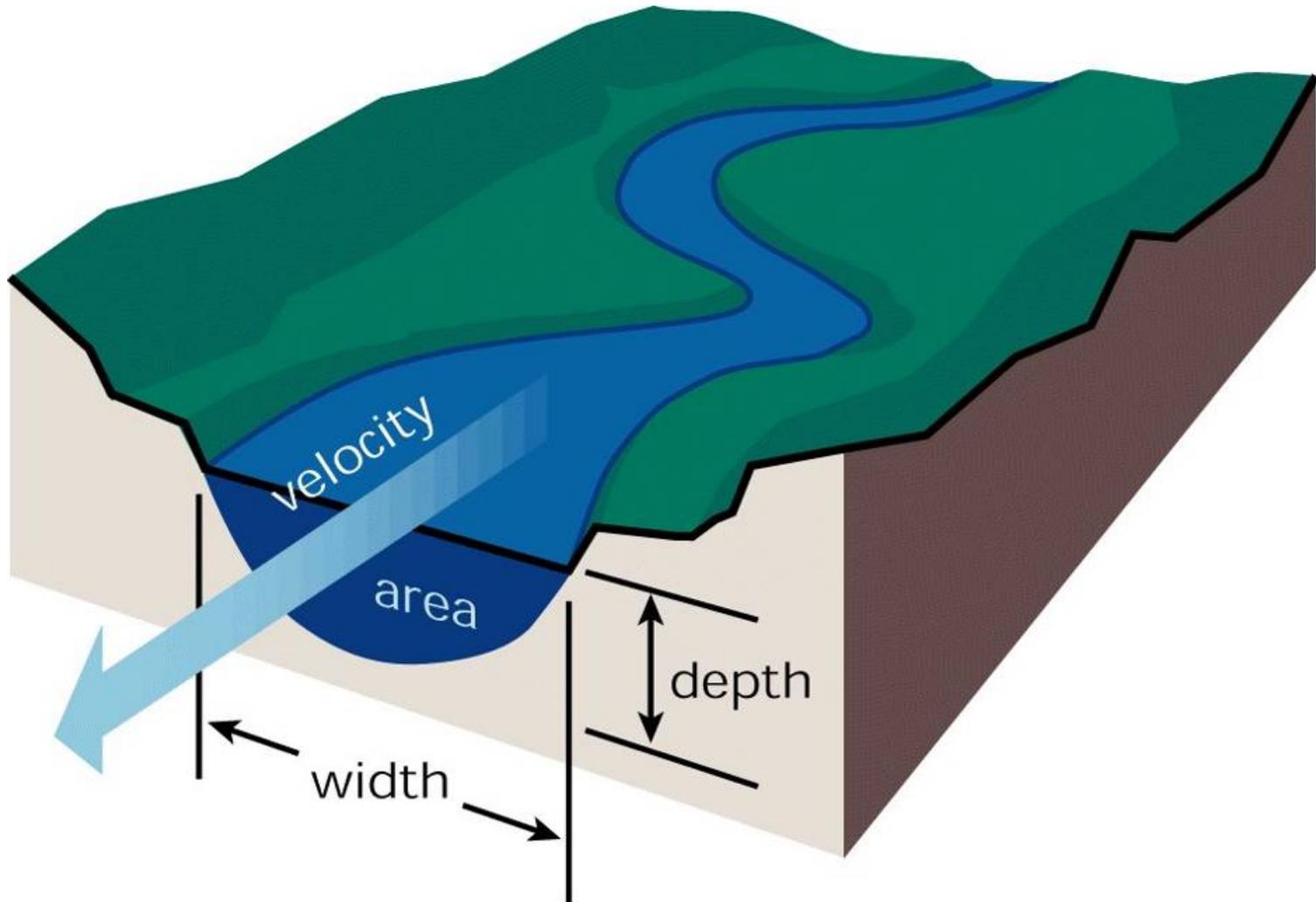
- Physical aspects of streams
 - Hydrology
 - Geomorphology
- Scale
 - Corridor
 - Reach
 - Cross section



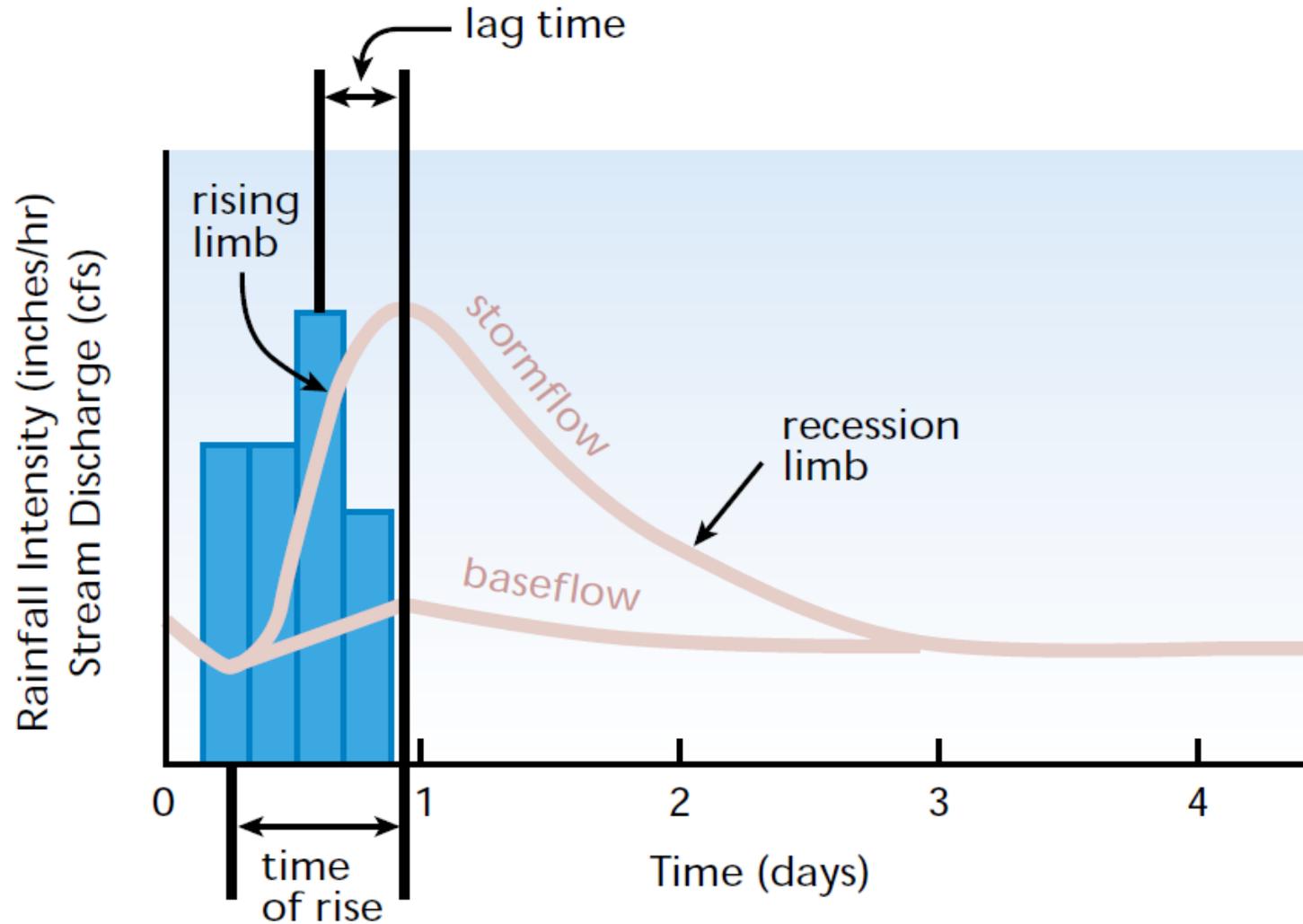
The functions of a stream are to transport water and sediment.

Form follows function.

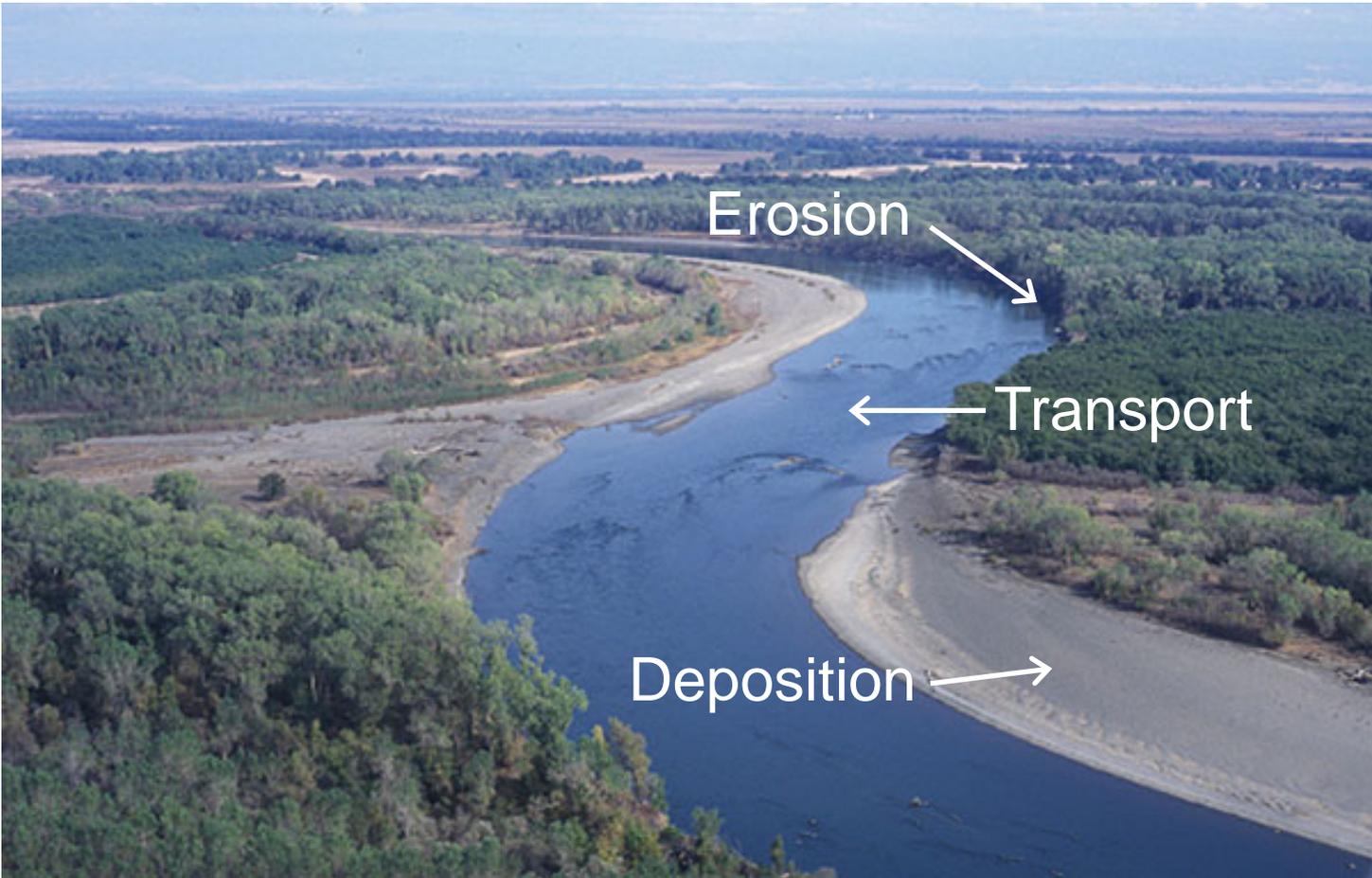
Discharge = Velocity \times Area



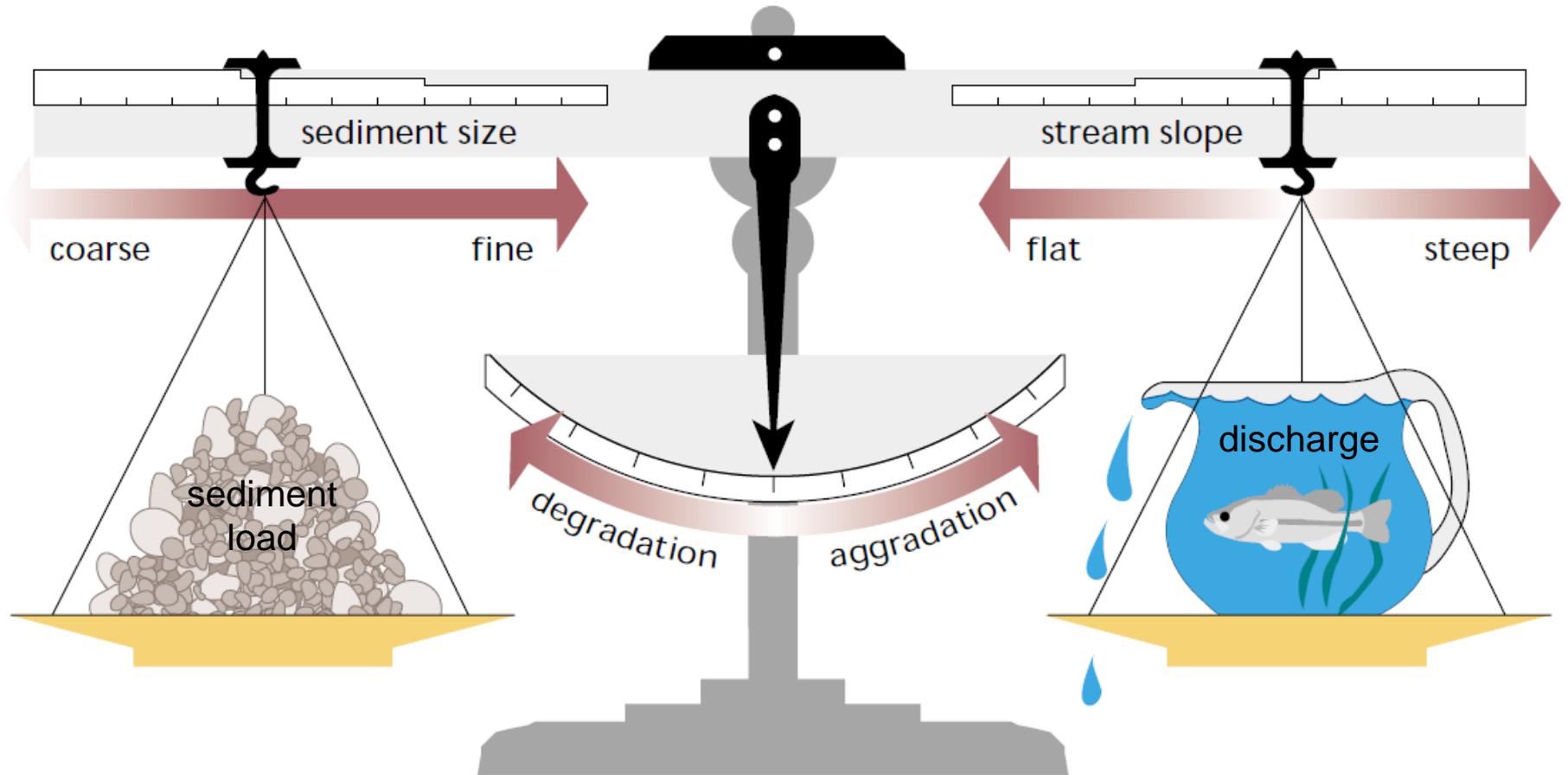
Stream Hydrology



Sediment

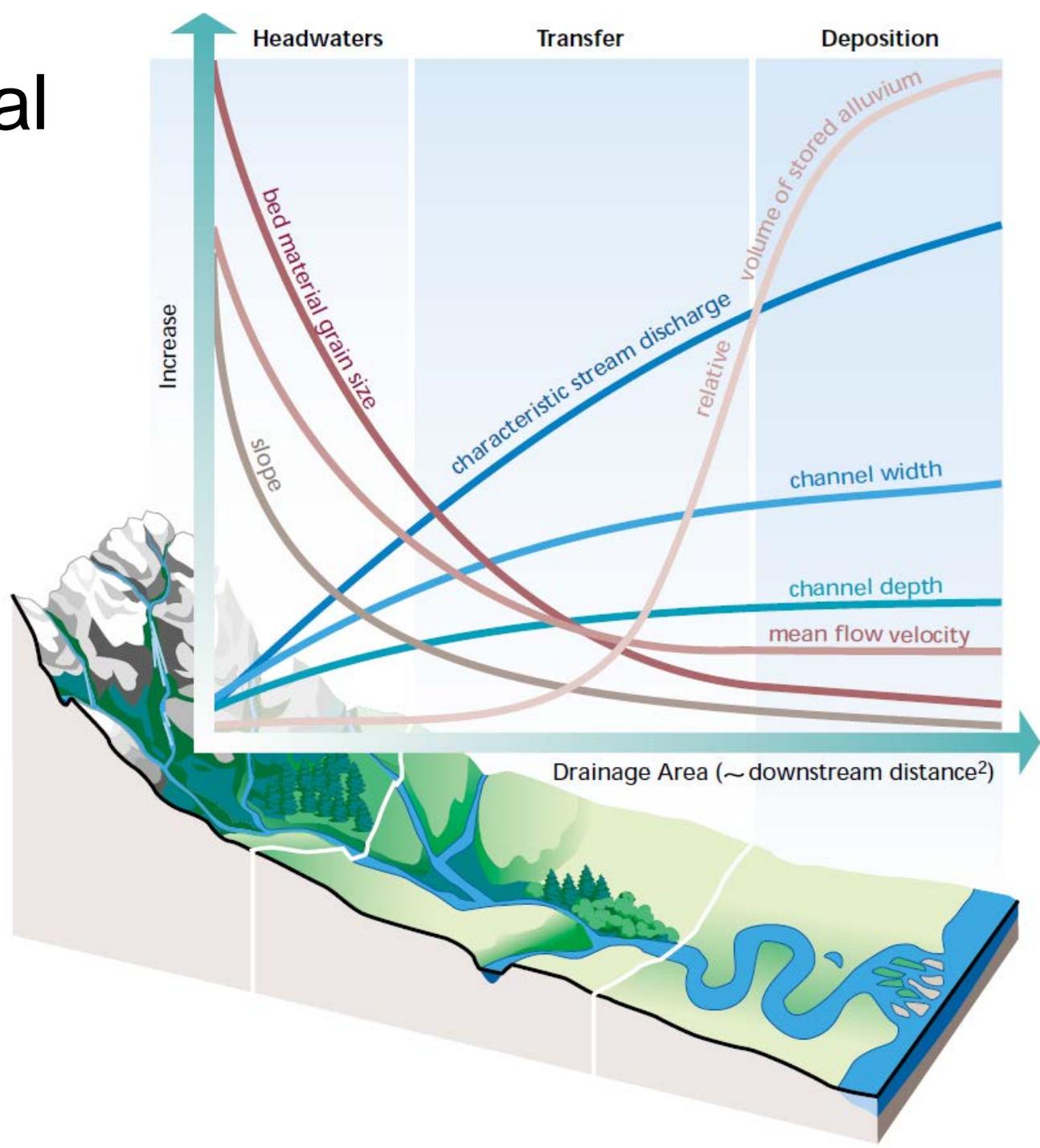


Factors Affecting Channel Equilibrium



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

Longitudinal Profile



Channel Planform

Single thread

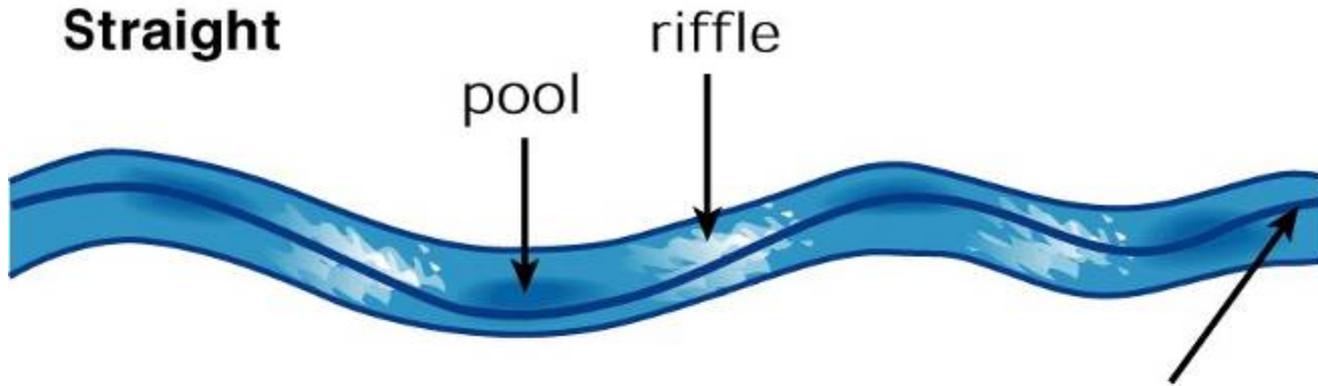


Braided

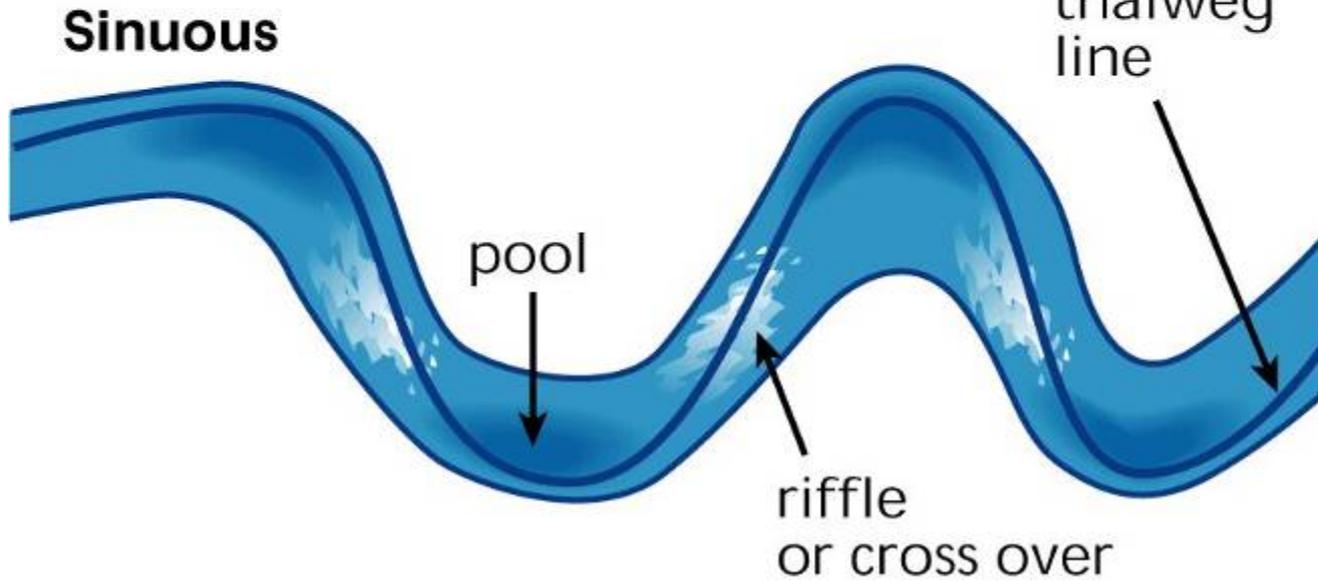


Sinuosity

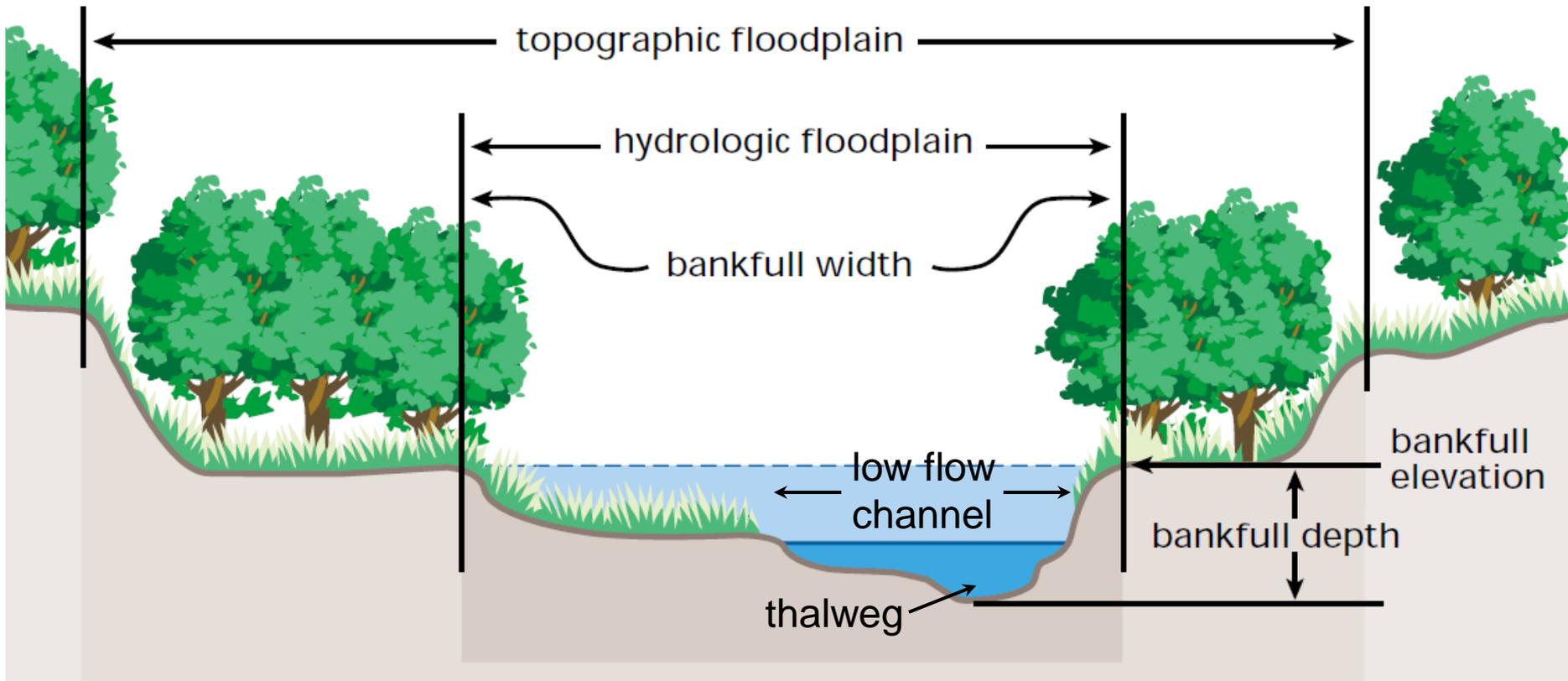
Straight



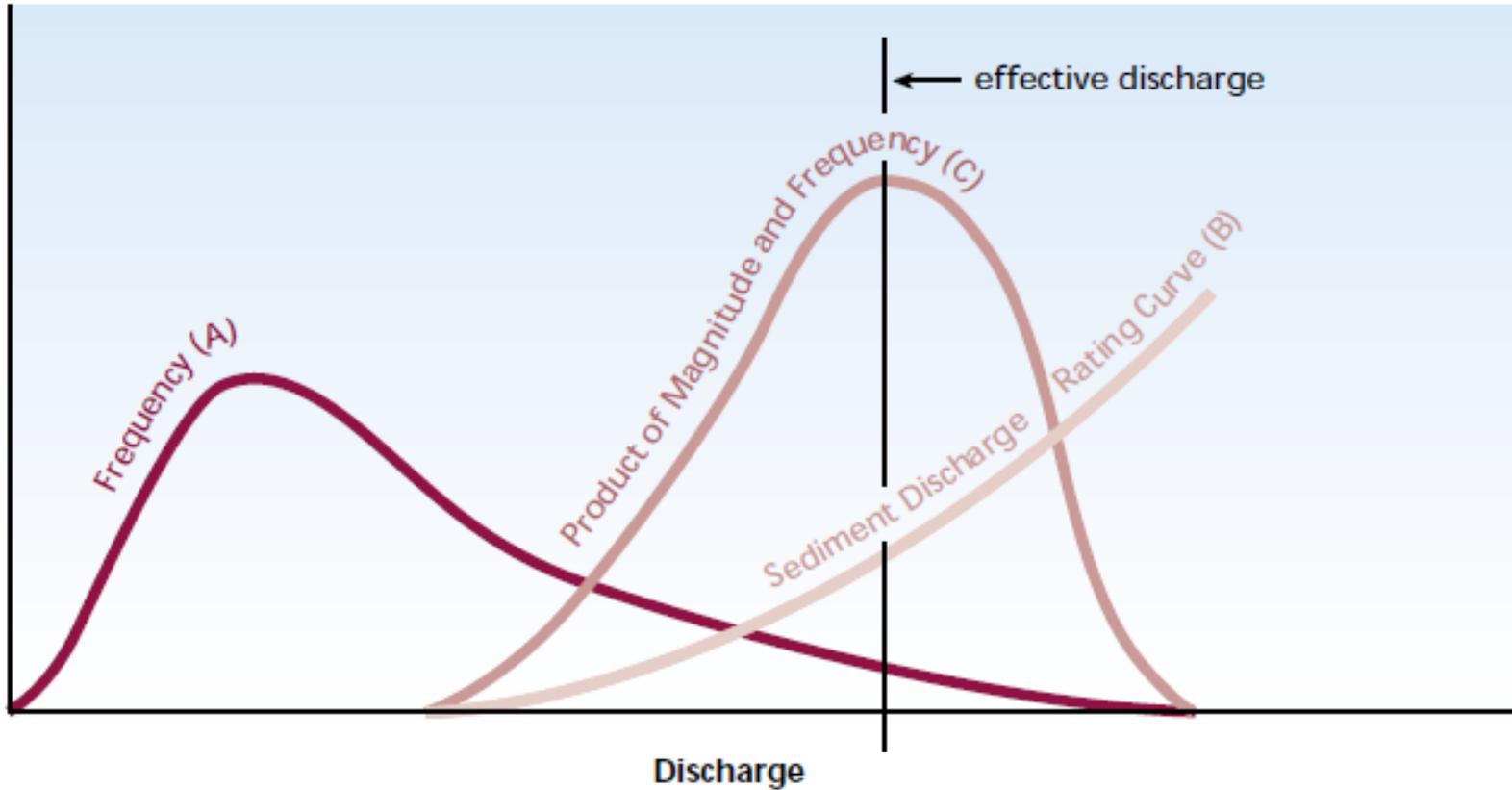
Sinuuous



Channel Cross Section



Effective Discharge

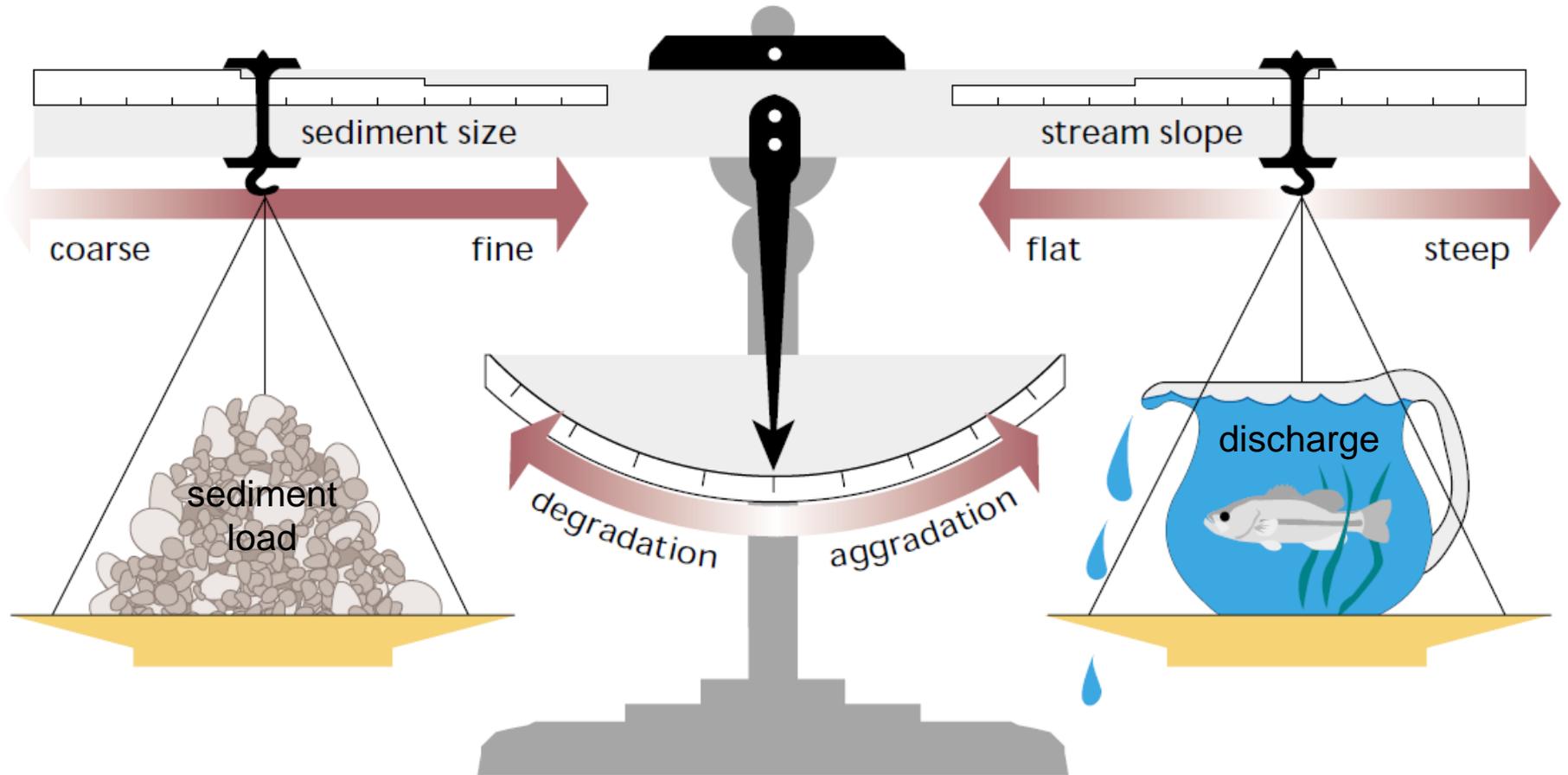


Bankfull (Effective) Discharge

- When the channel is completely full and water begins to spread onto the floodplain
- Occurs every 1.5 years on average



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 green 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 body of brown water.

Questions?