

An Introduction to River Sediments

By: Staci Pomeroy - DEC River Scientist

Looking at sediment in the streams

Where does it come from and where does it go



Fulmer Creek
German Flatts, NY
(M. Carabetta, 2013)



Roaring Branch
Bennington/Woodford , VT
(MMI, 2011)

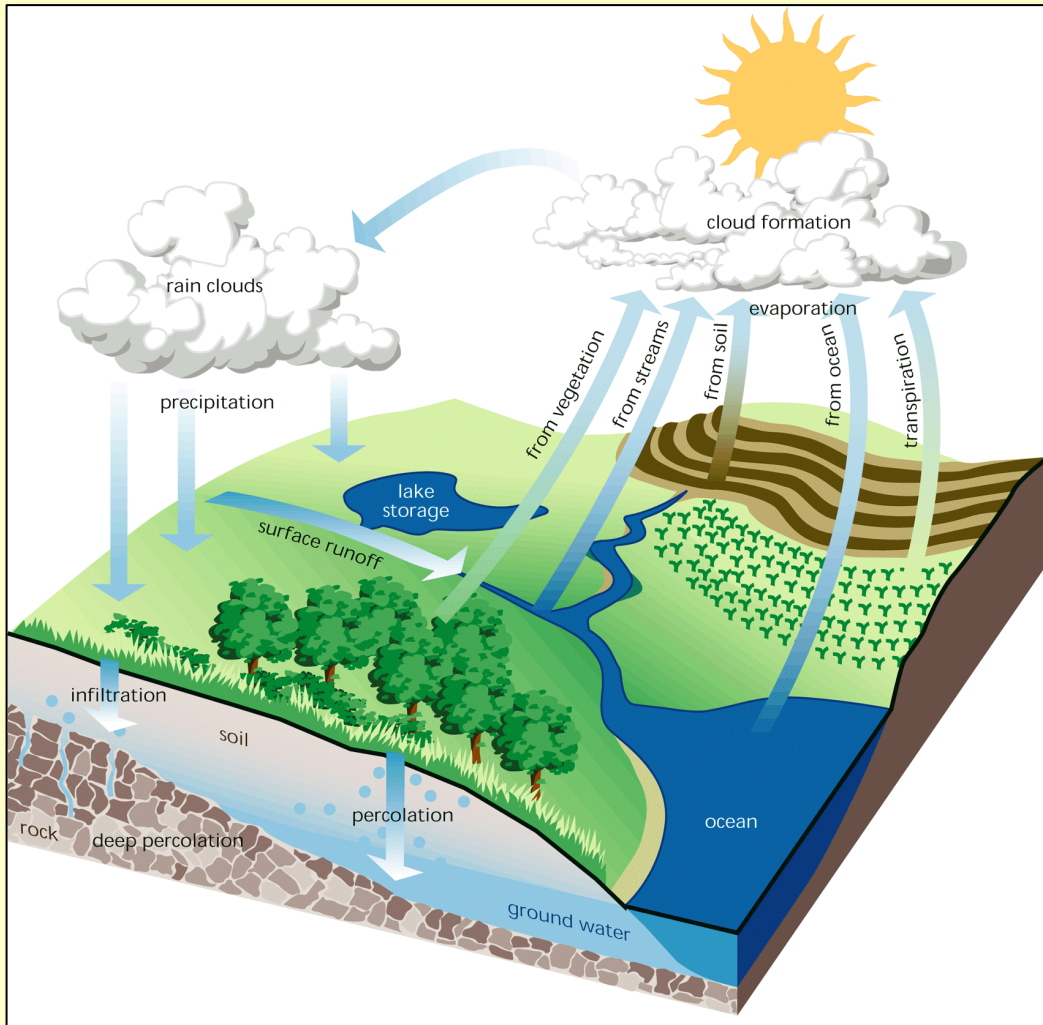
Watershed Scale Inputs of:

Water

Sediment & Debris

What influences those Inputs:

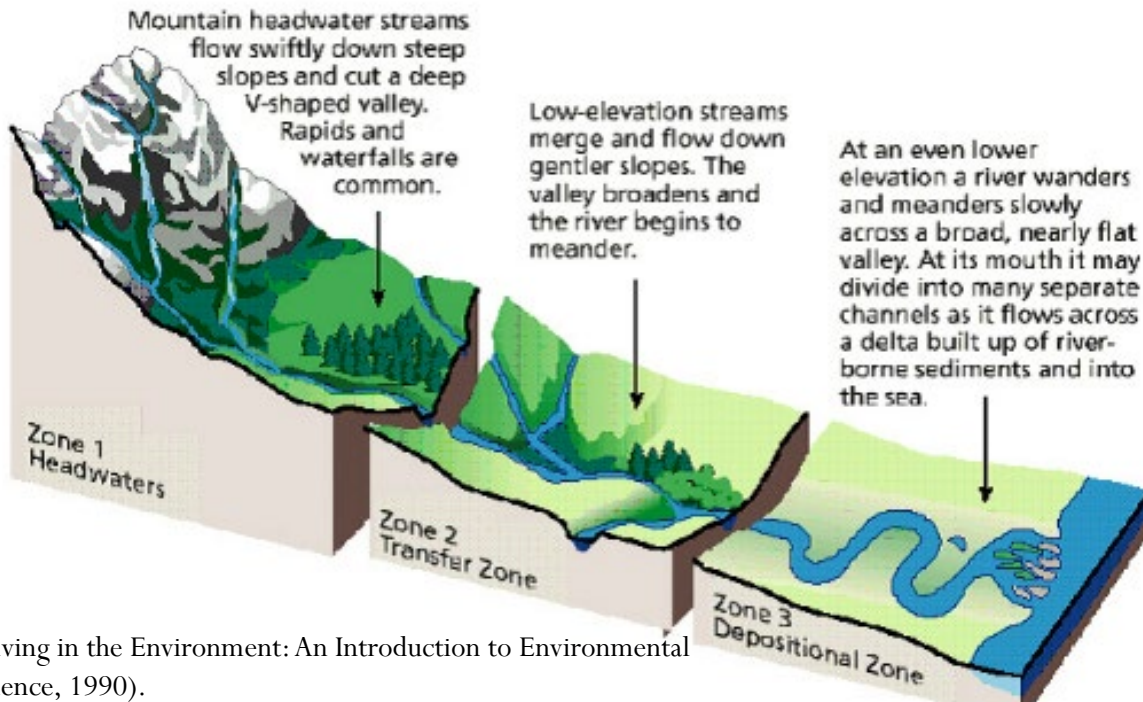
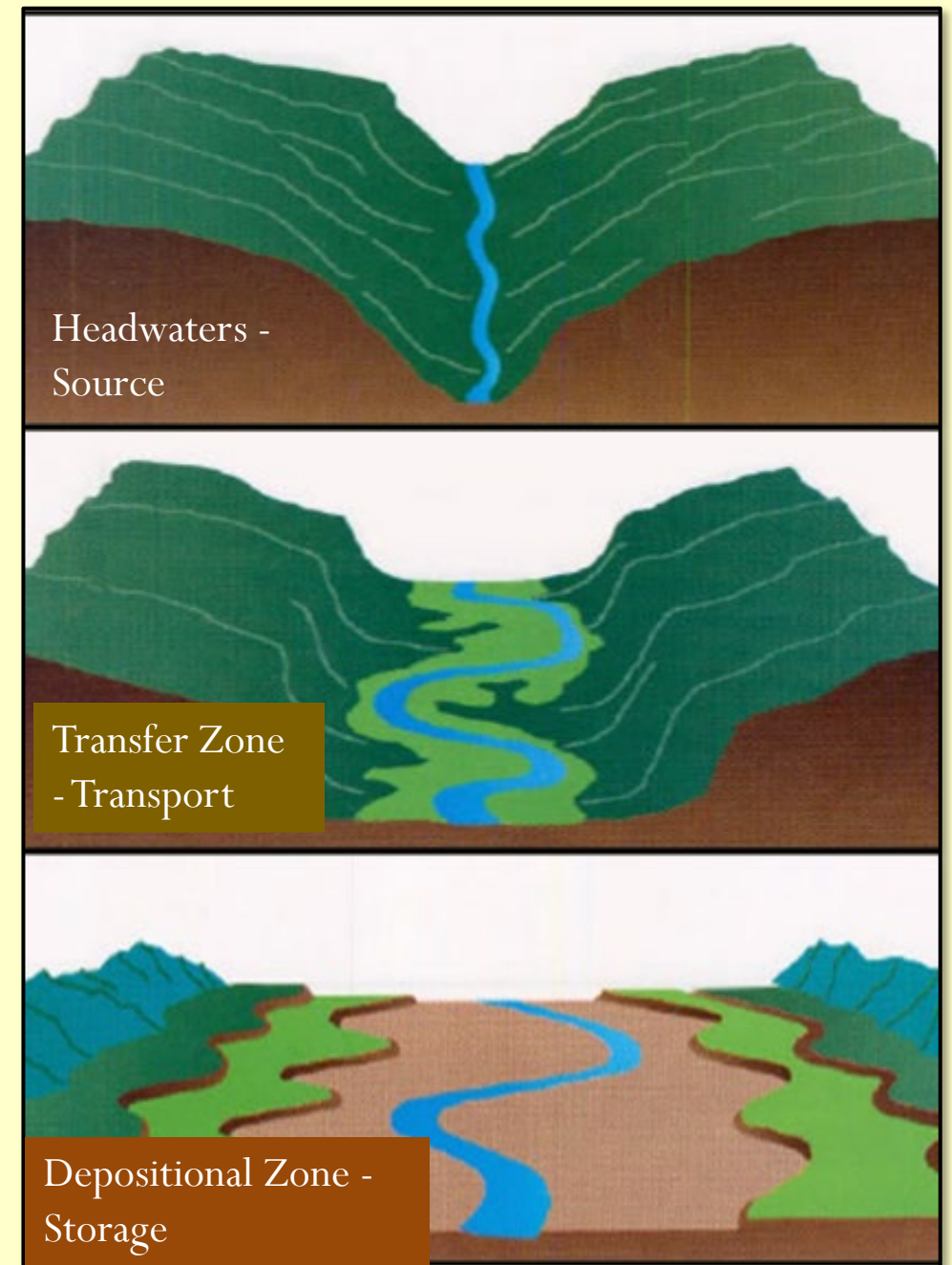
- Land-use / Land-cover
- Location in the landscape
- Stream stability
- Type of soils
- Climate / Flooding
- Nearness to the stream



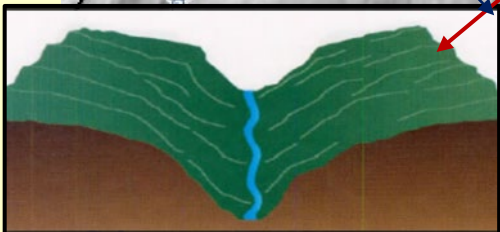
Valley Setting

Valley width and slope strongly influence sediment in the river

- Source
- Transport
- Storage

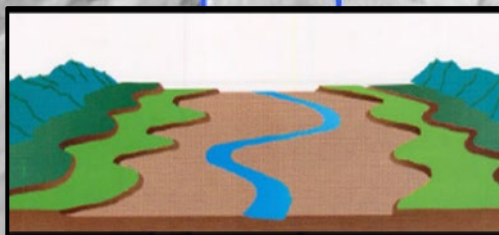


Bunker Brook
- Source



Alder Brook Ri-
Storage

Lamoille River -
-Storage

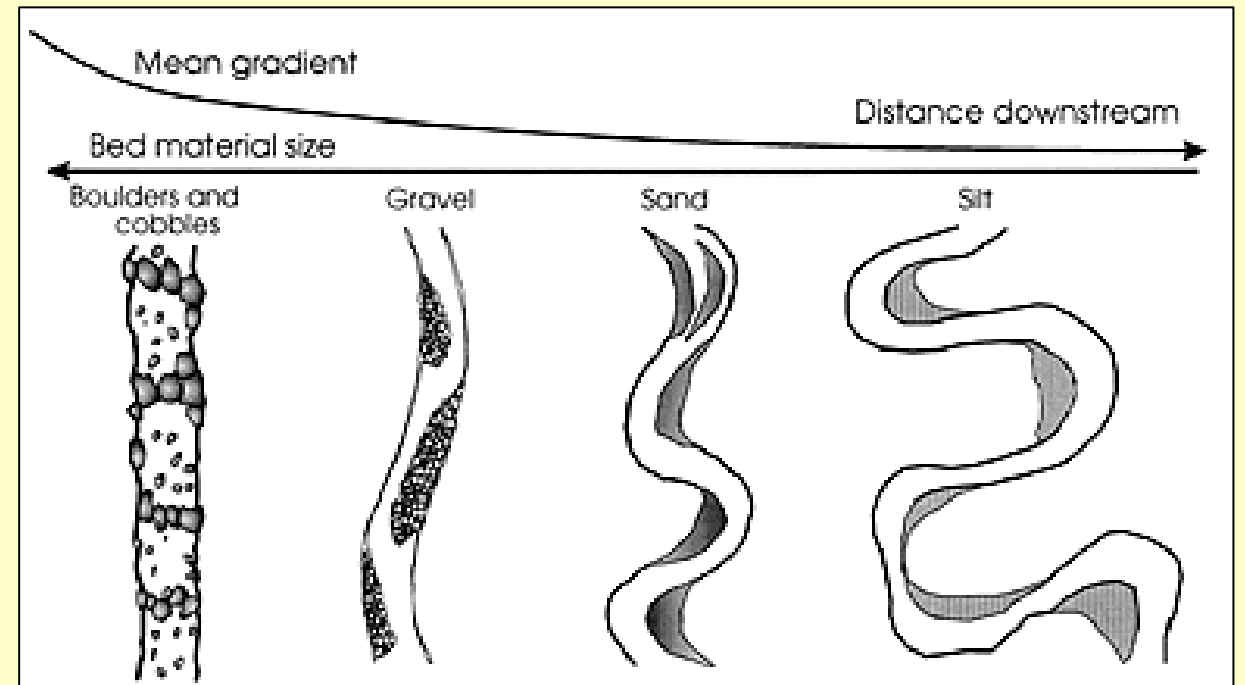
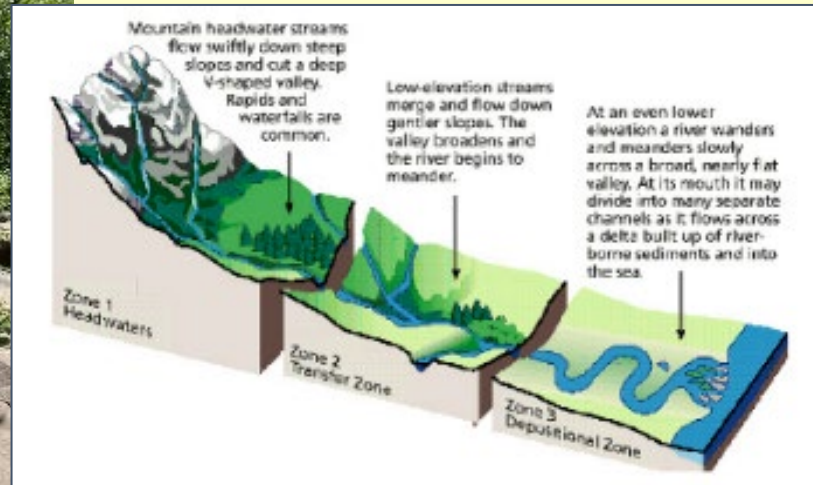


HARDWICK

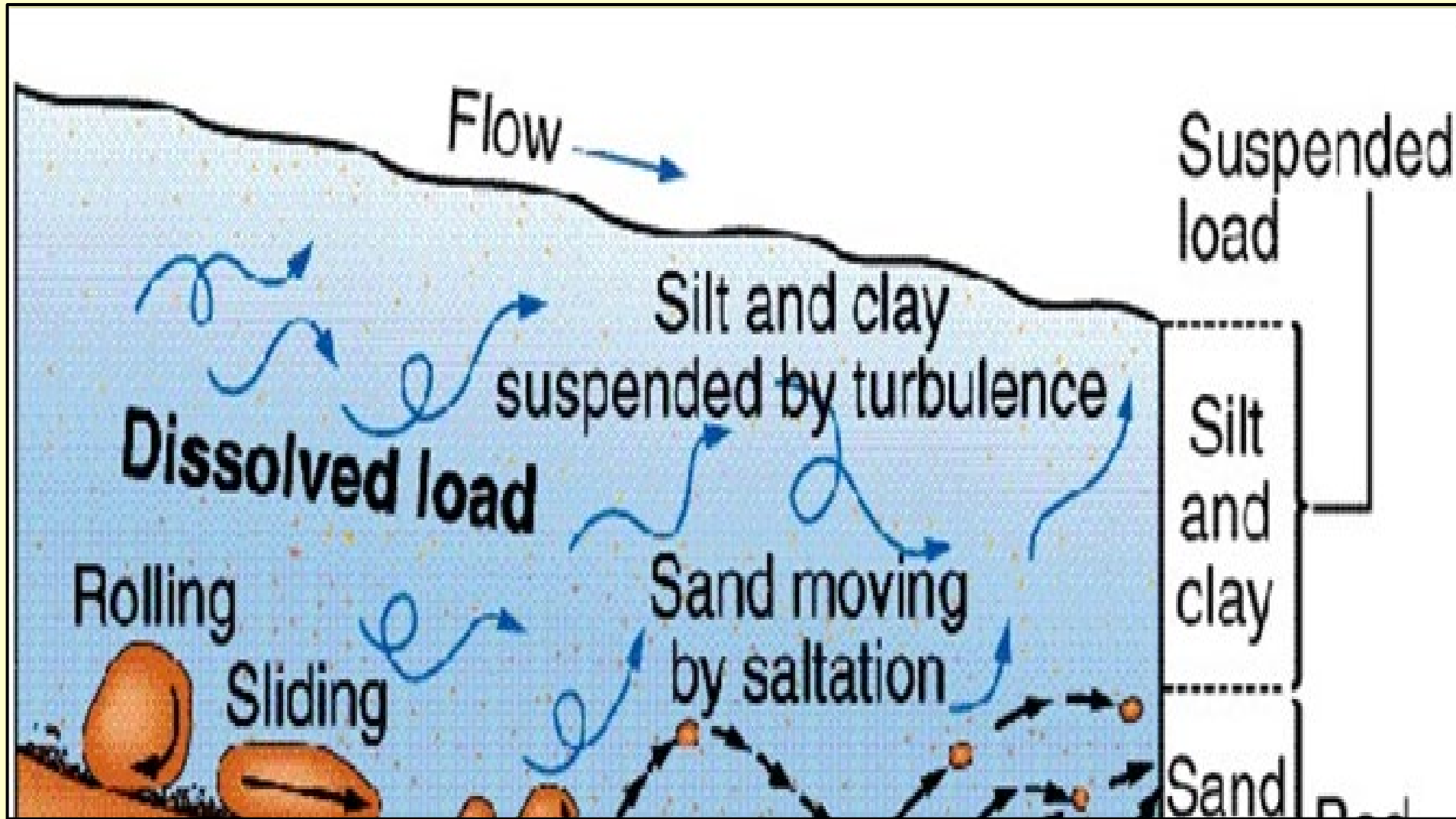
Lamoille River
- Transport



Sediment Types



Sediment Transport : Suspended Load & Bed Load



Sediment Storage



In the
Channel



In the
Floodplain



Sediment: Transport & Storage

Alluvial Fan

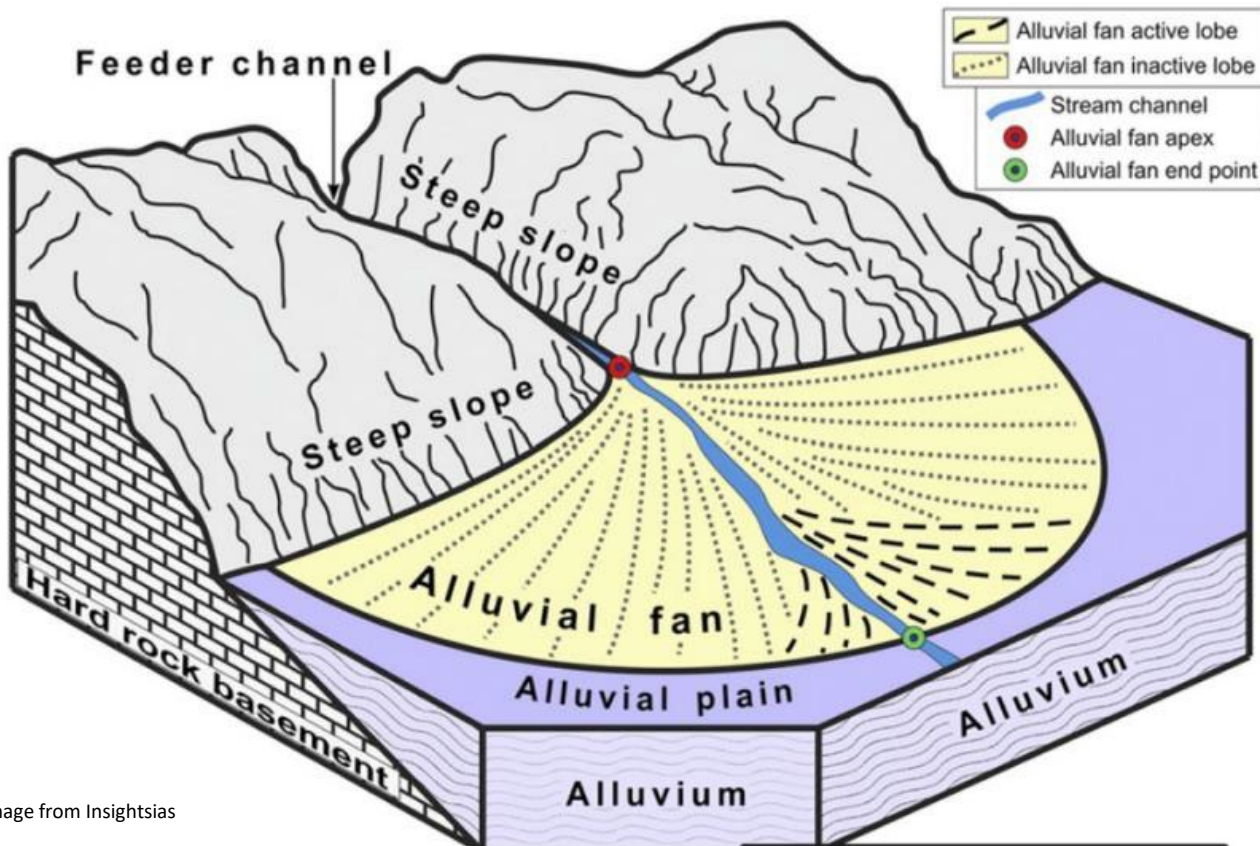
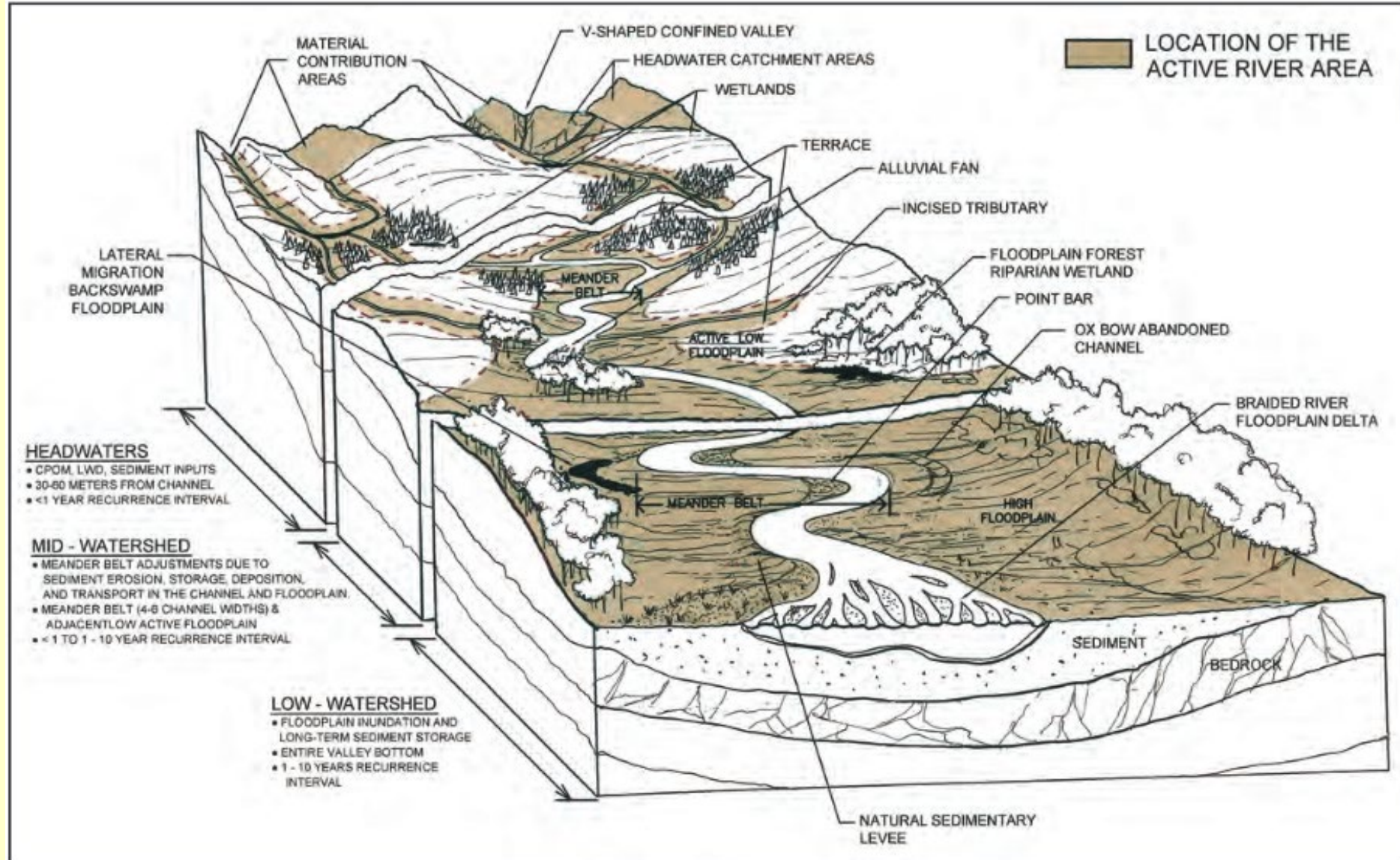


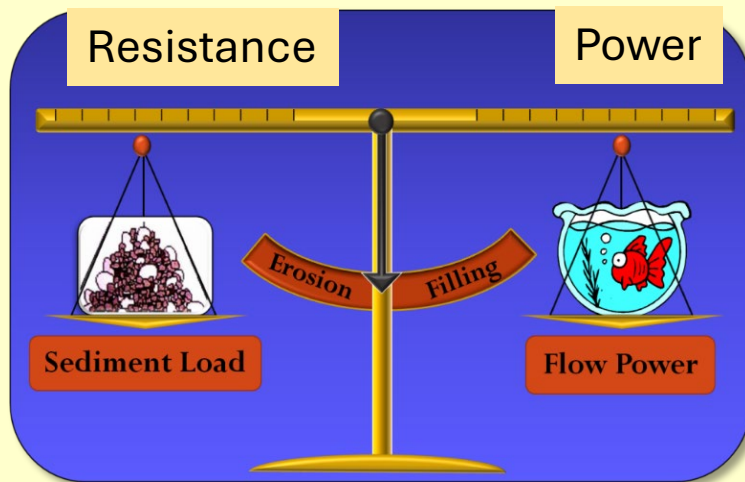
image from Insightsias



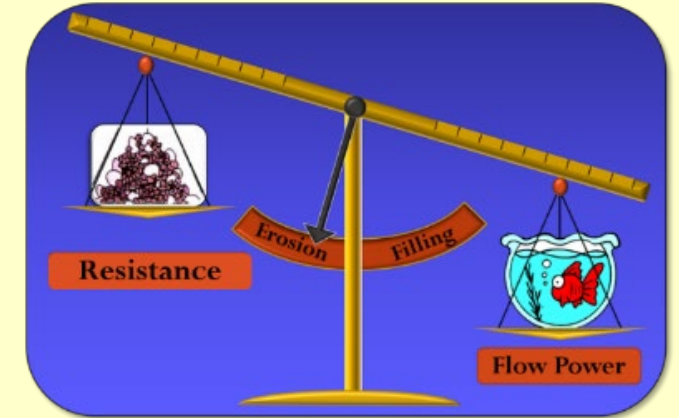
Sediment Sources & Storage Across the System



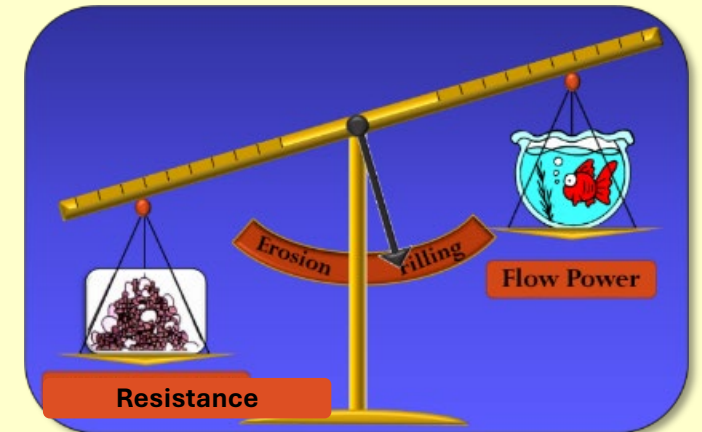
What factors can lead to changes in the stream sediment?



Emory W. Lane's Diagram (1954)

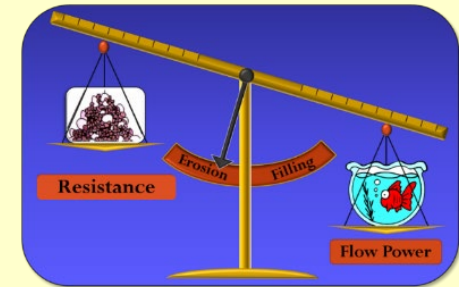
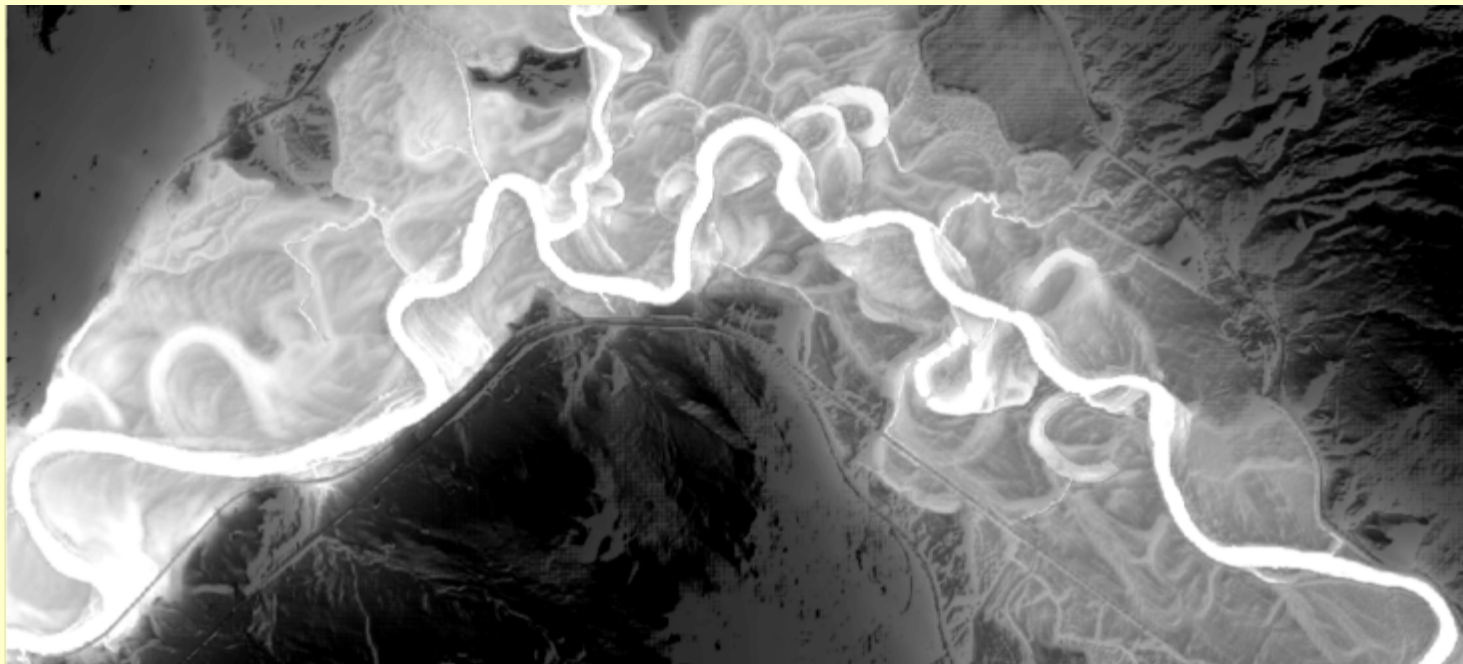
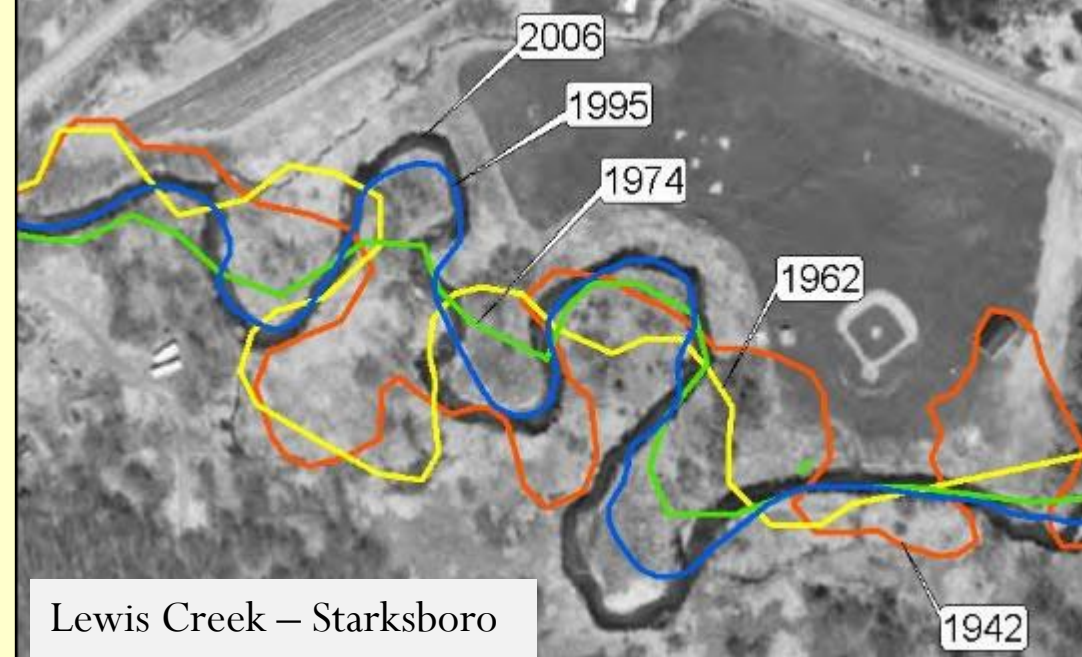


Erosion



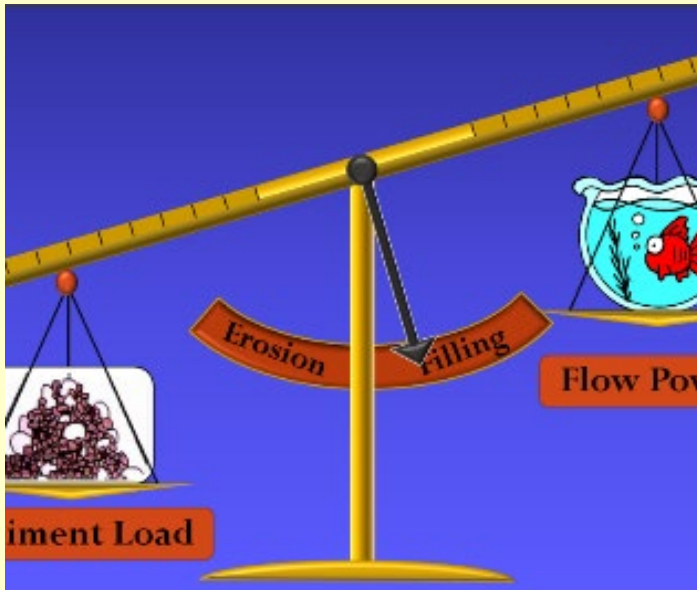
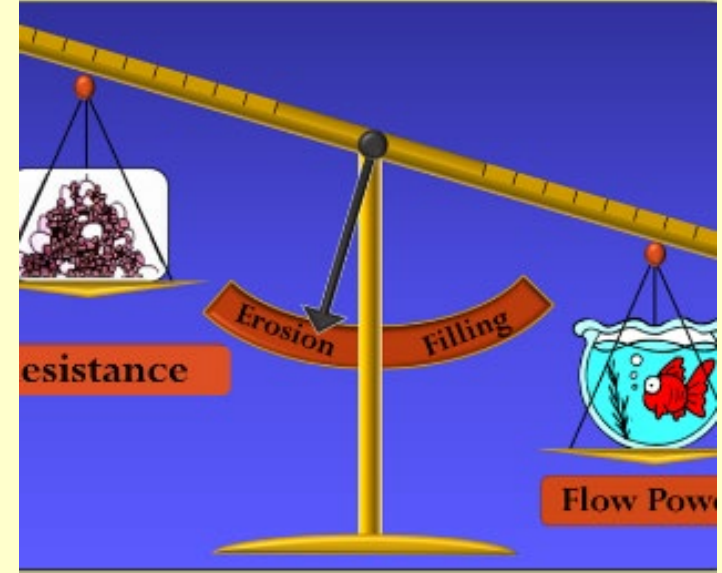
Filling

Rivers Change Over Time

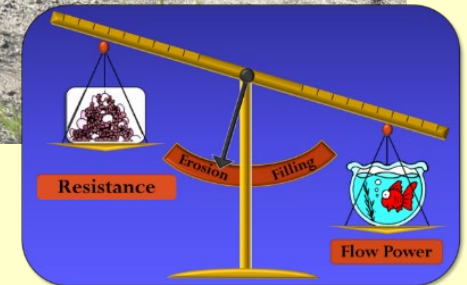


Enhanced elevation review of LIDAR shows old channel and meander scars at of North Branch confluence with Lamoille River

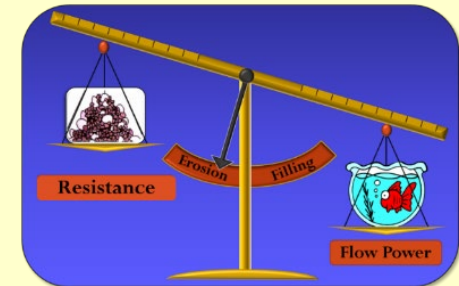
Biology



Flooding

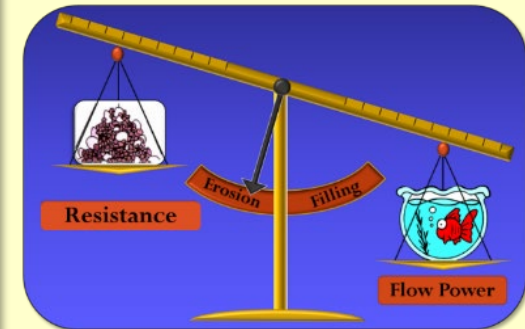
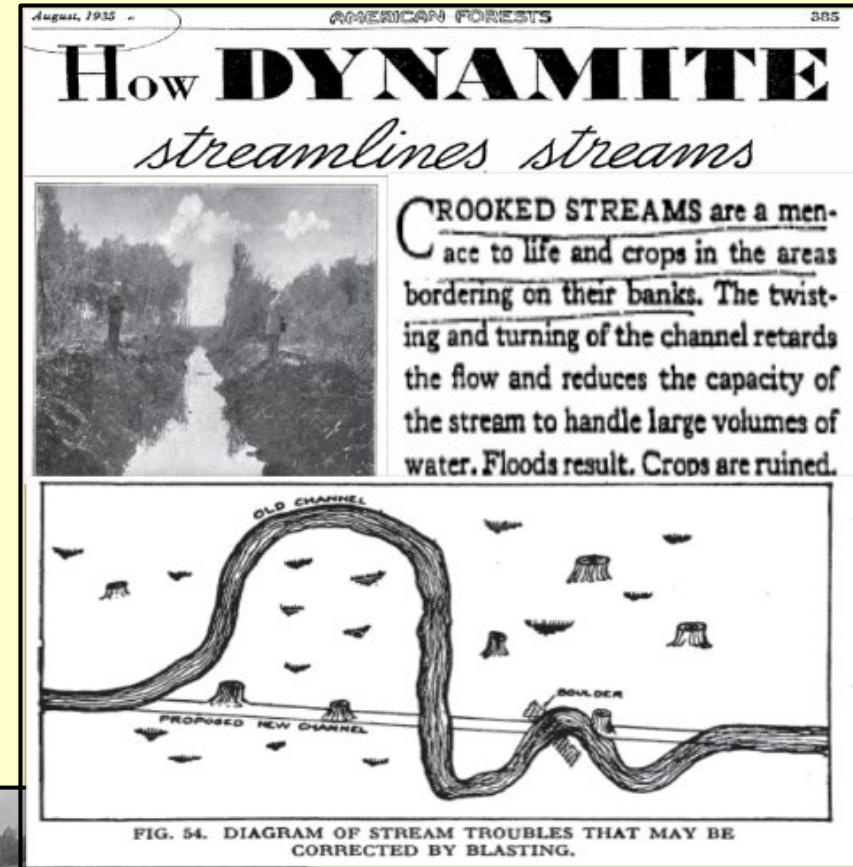


Riparian Vegetation & Wood





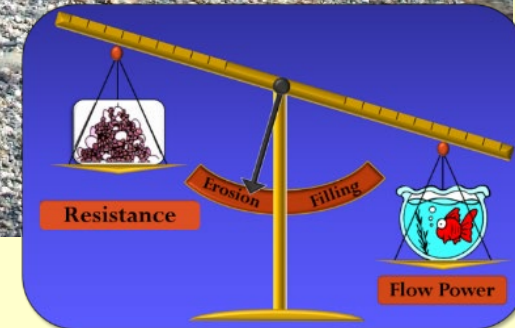
Intentional Modification



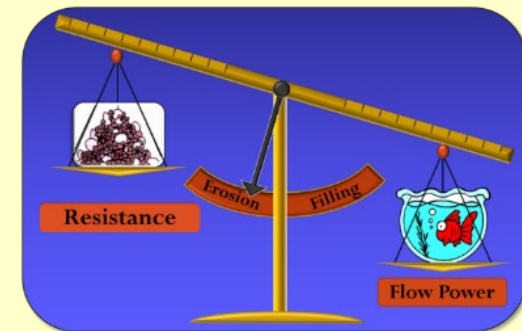
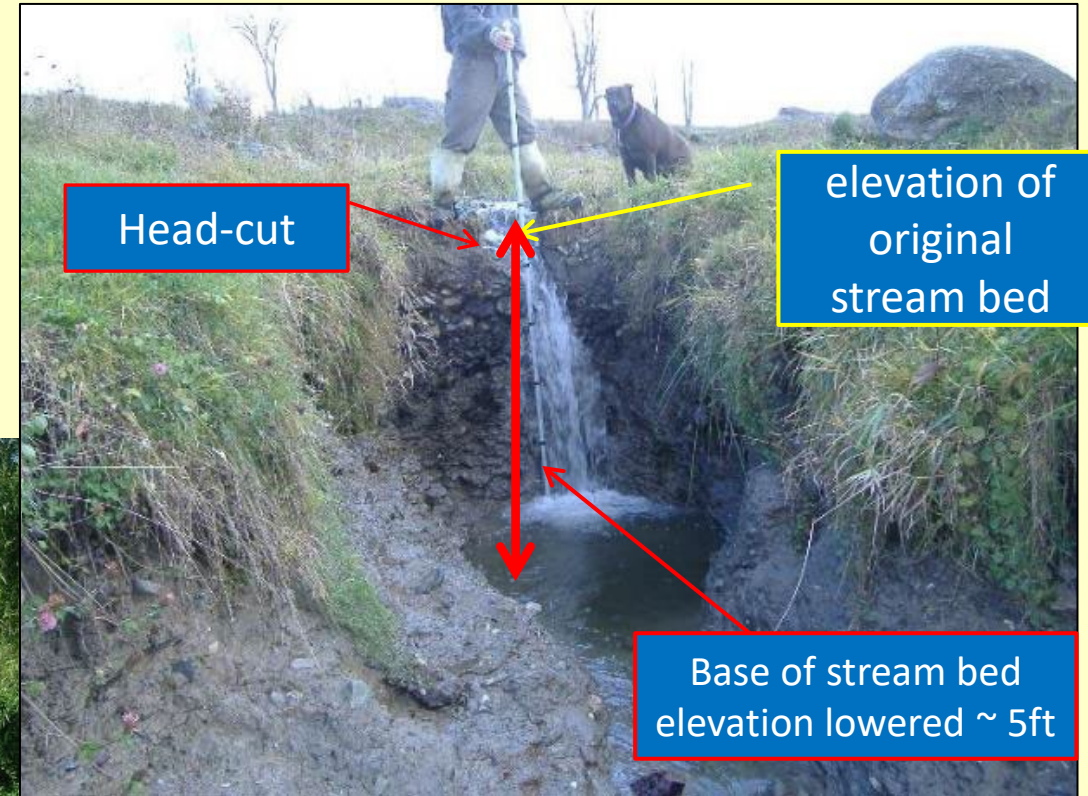
Gravel and Wood Removal

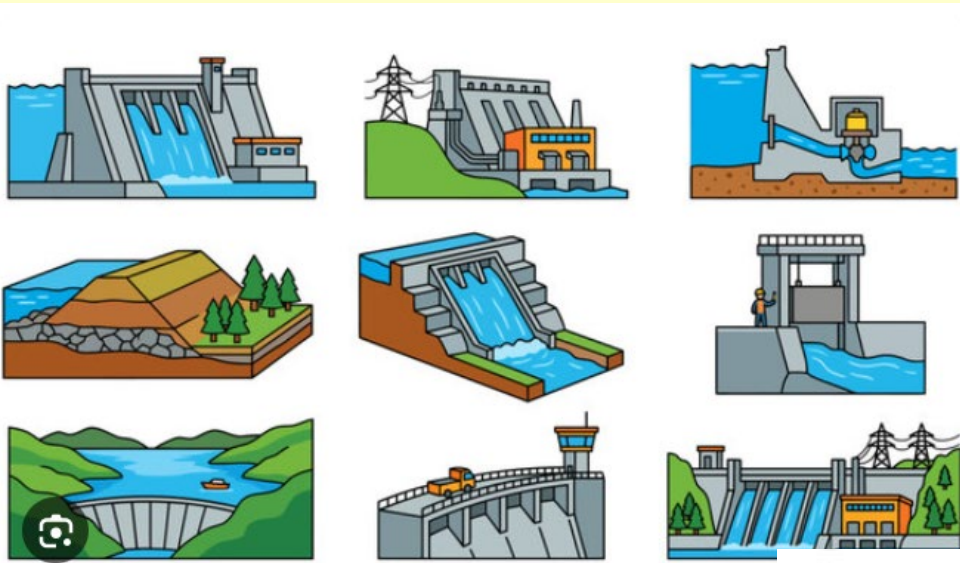


Gilead Brook – Bethel
Post – Irene 2012

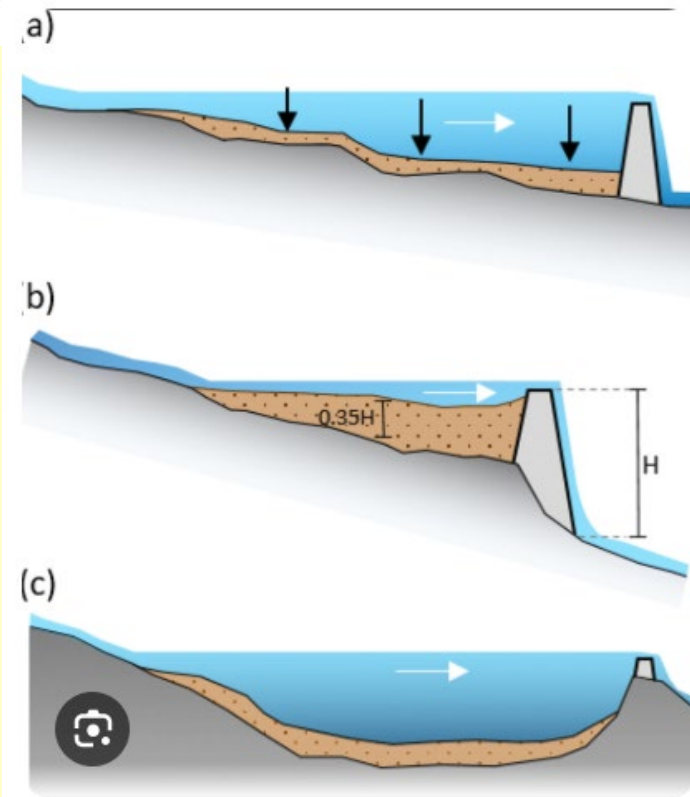
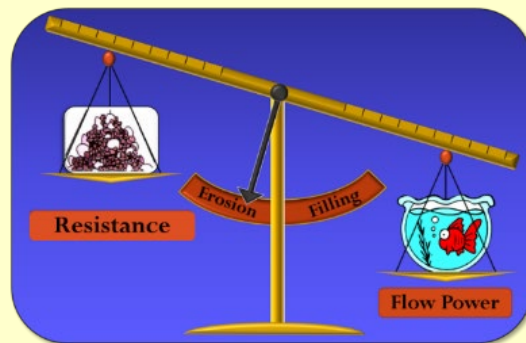
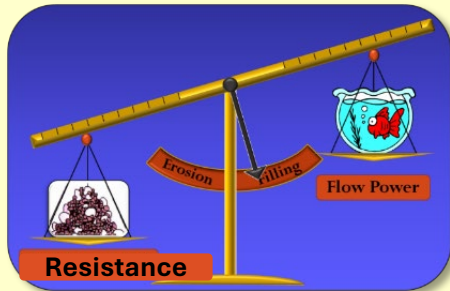


Digging Deeper

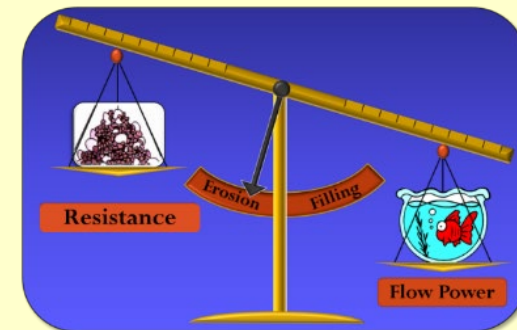




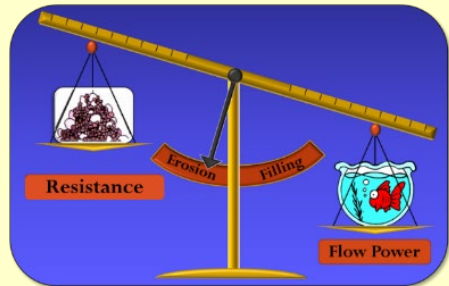
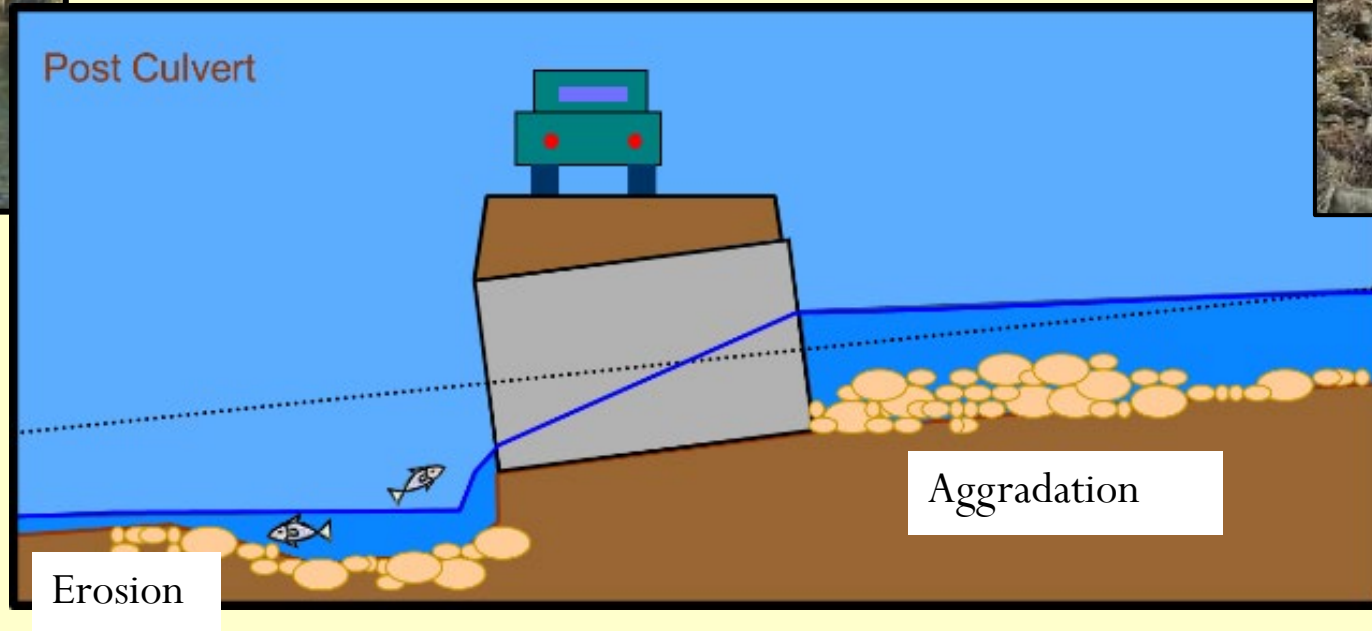
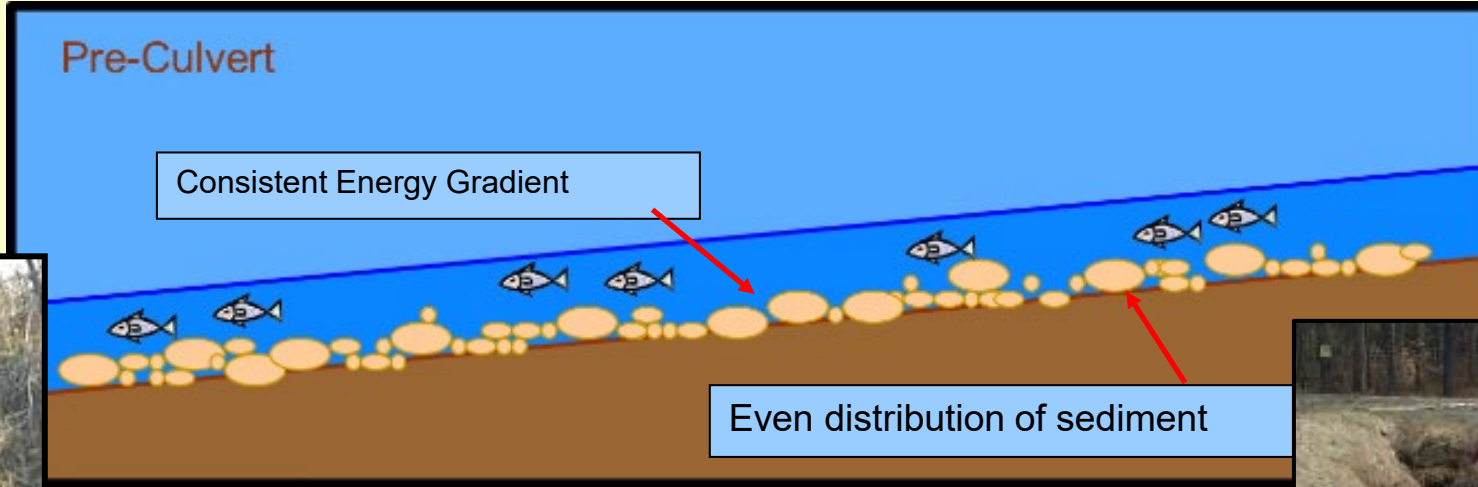
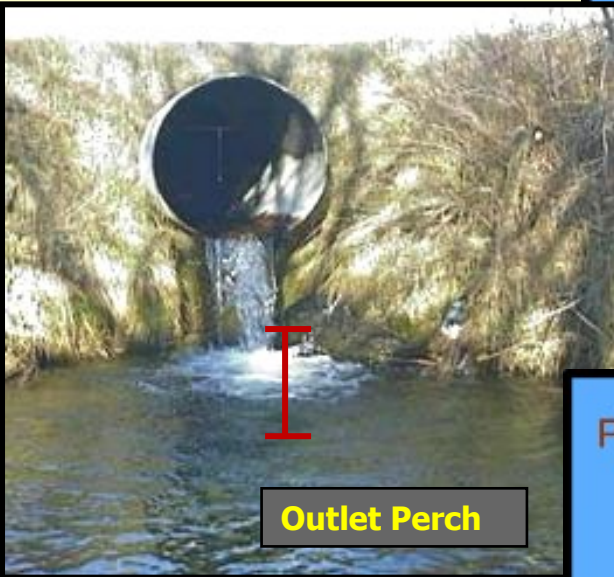
Dams



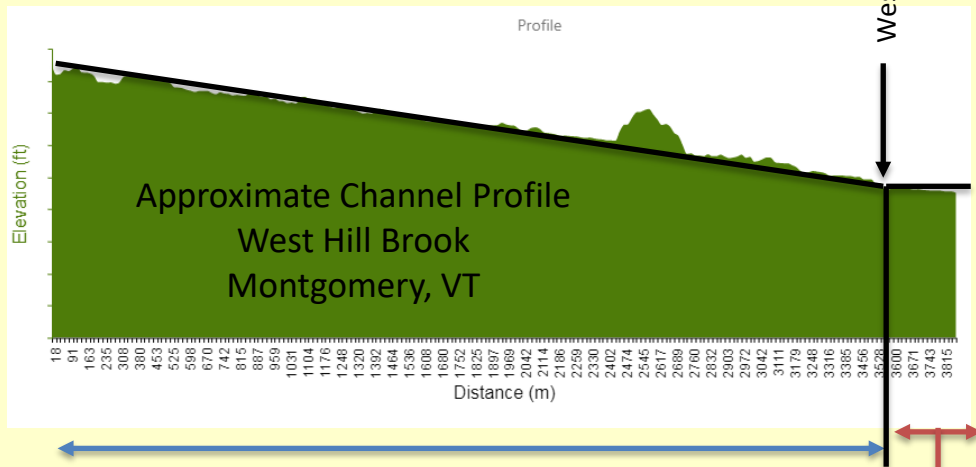
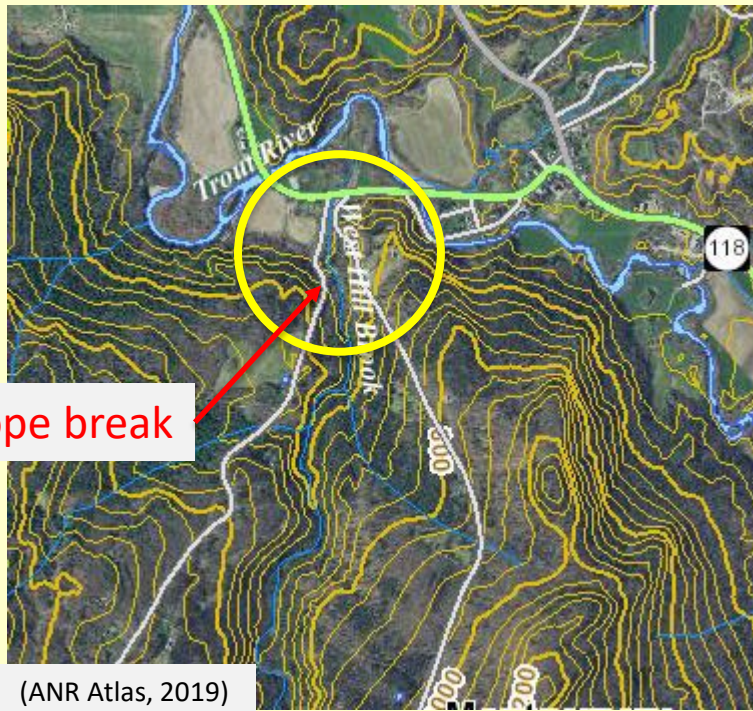
Stormwater, Bank Stabilization, Development



Undersized Culverts



Undersized Bridge on an Alluvial Fan



Steeper Slope ~ Greater Velocity

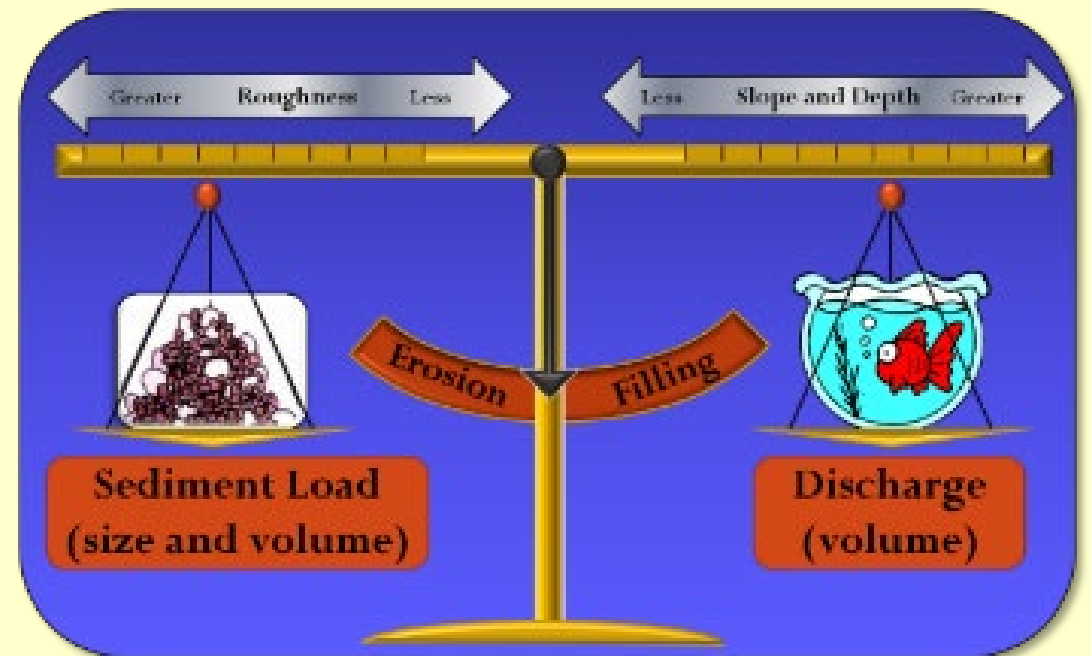
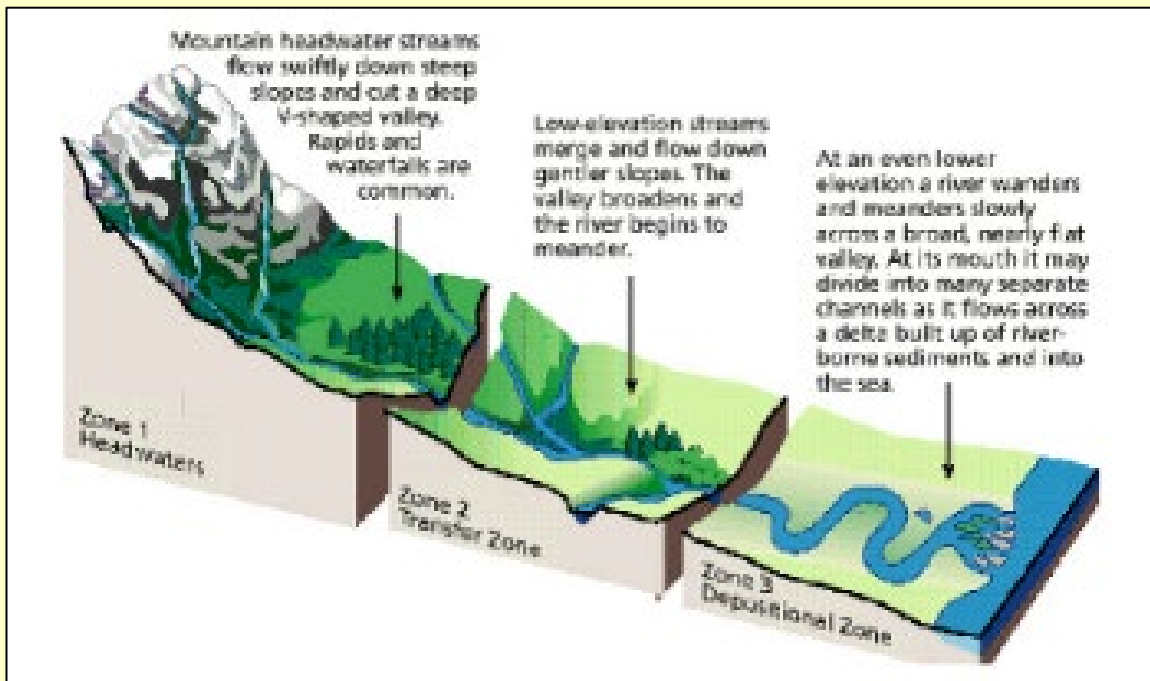
Milder Slope ~ Lower Velocity



Downstream Face of the West Hill Road Bridge
Sediment Buildup
West Hill Brook
Montgomery, VT . Image from DEC staff 2006



For restoration and flood recovery projects to be successful,
we need to understand stream process and
how our project(s) tip the Balance.



Contact Info.

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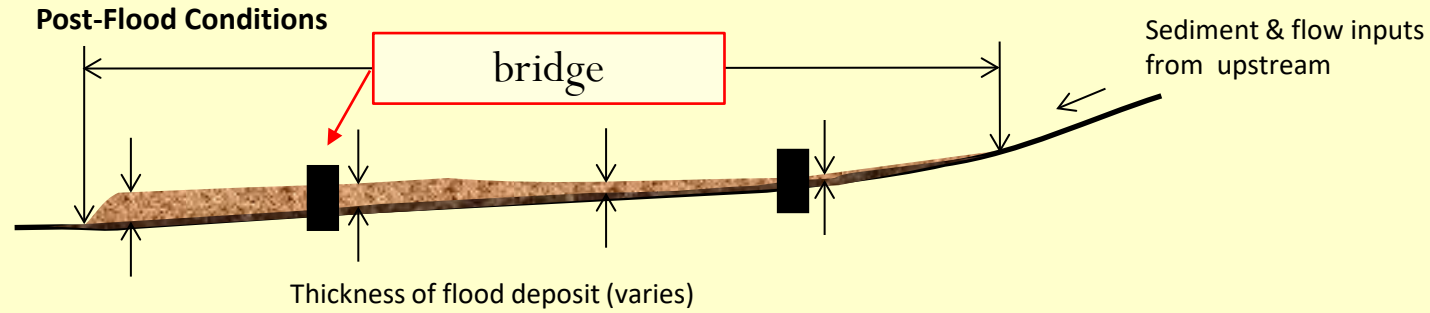
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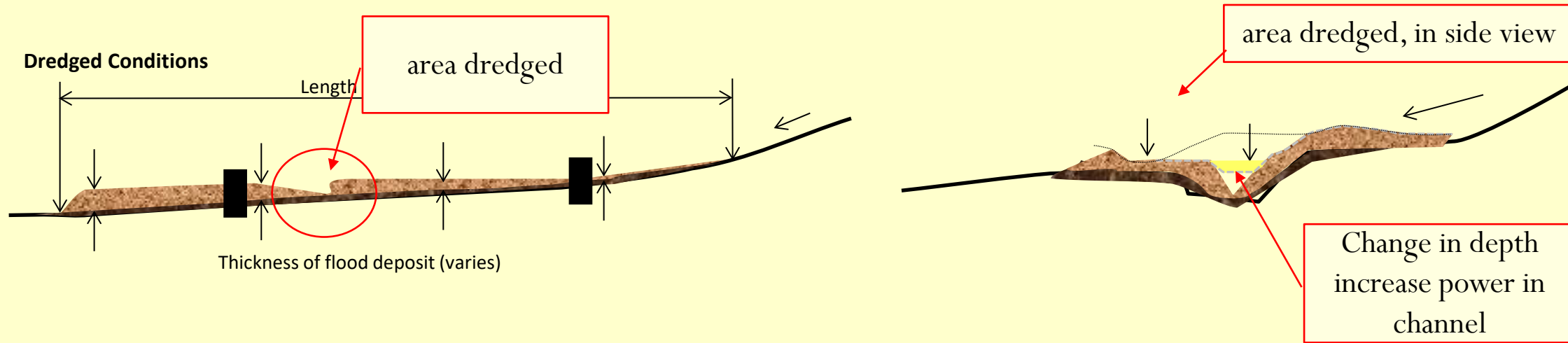


Why does gravel removal not provide a long-term fix

1.



2.



3.

