

River Corridors and Floodplains

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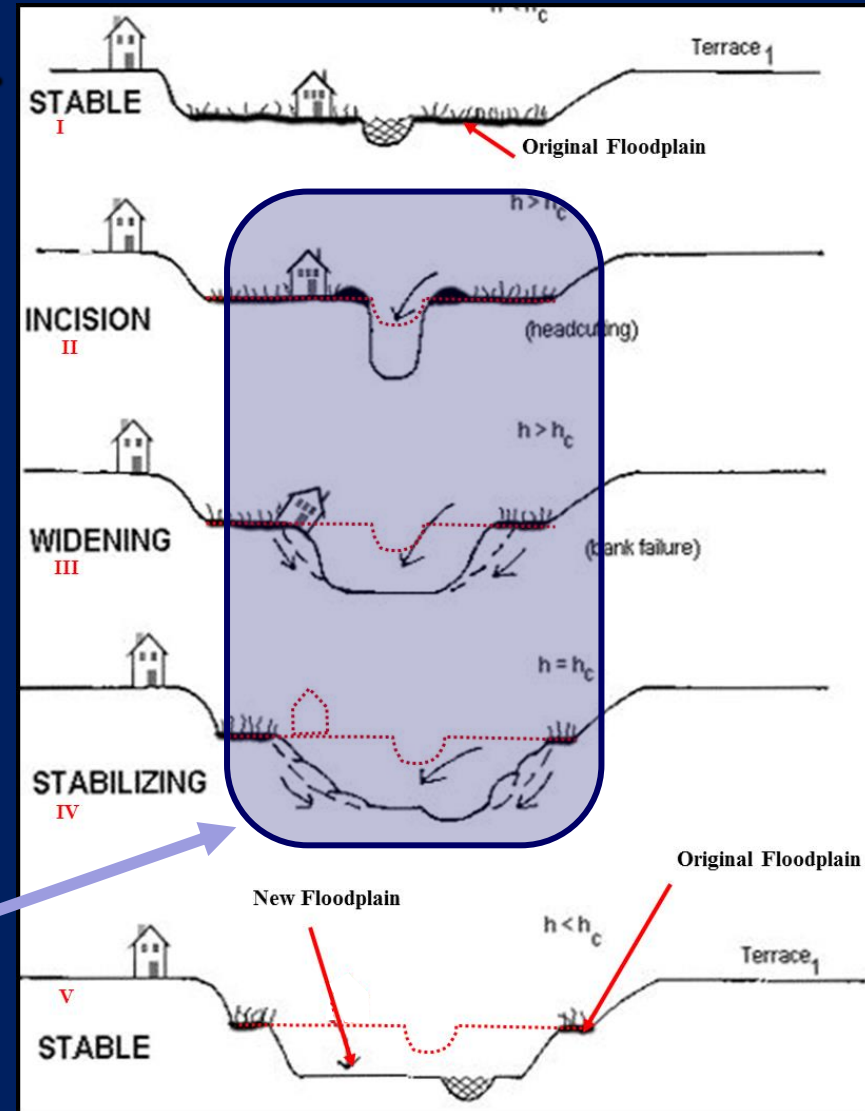


The loss of flood storage and the increase in fluvial erosion

200+ years of channel, floodplain and watershed modifications trigger stream channel evolution:

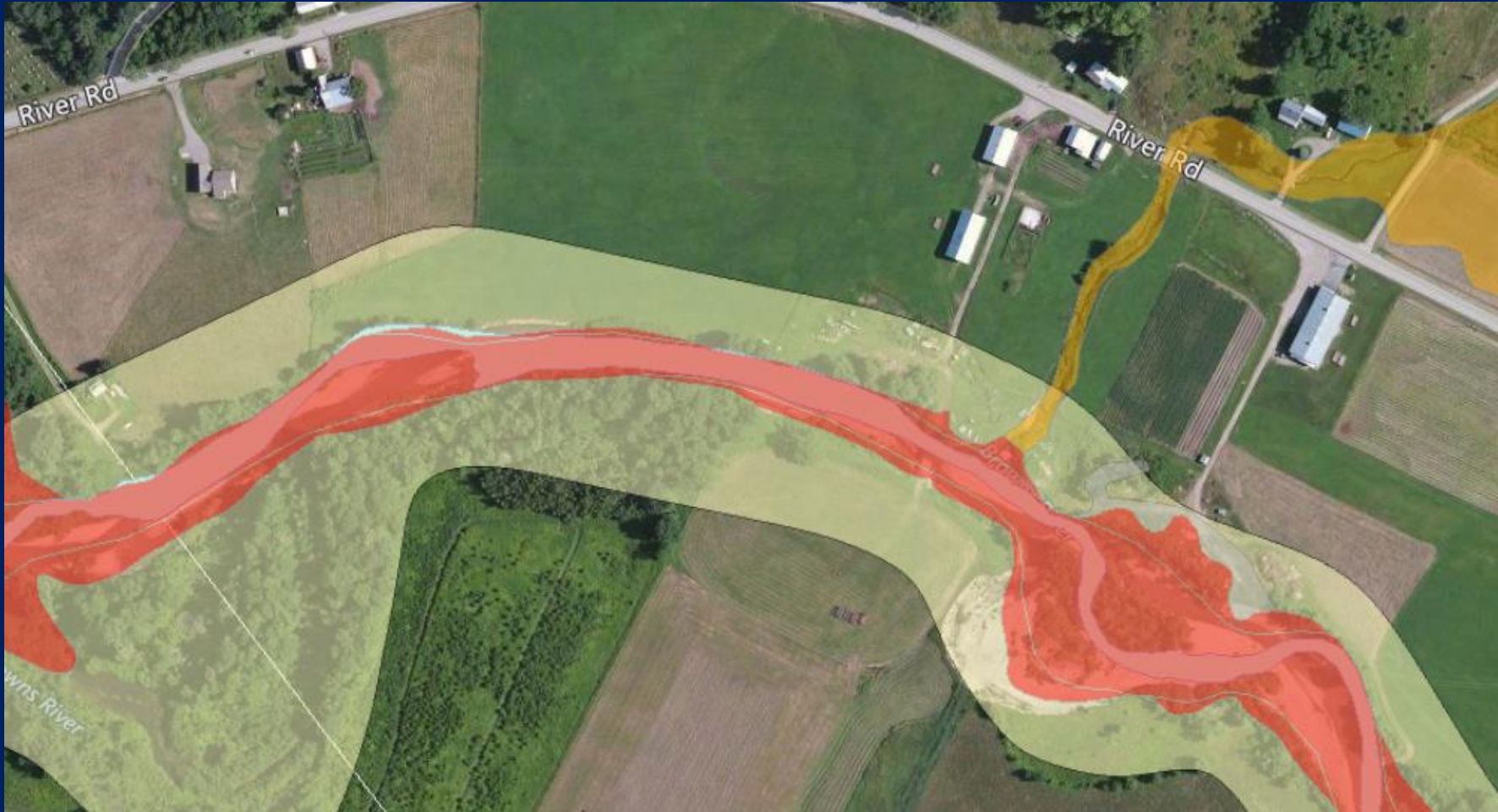
- Historic deforestation
- Floodplain filling for villages, farms, roads and rails
- Stormwater & higher peak flows
- Dams and undersized culverts
- Snagging, ditching & diversions
- Gravel removal & berming
- Straightening & armoring

73.5% Streams moderately to severely incised and lacking floodplain connectivity
(more erosion -- less storage)



>2,300 miles of field assessed streams

Inundation Maps produced at the height of channel incision



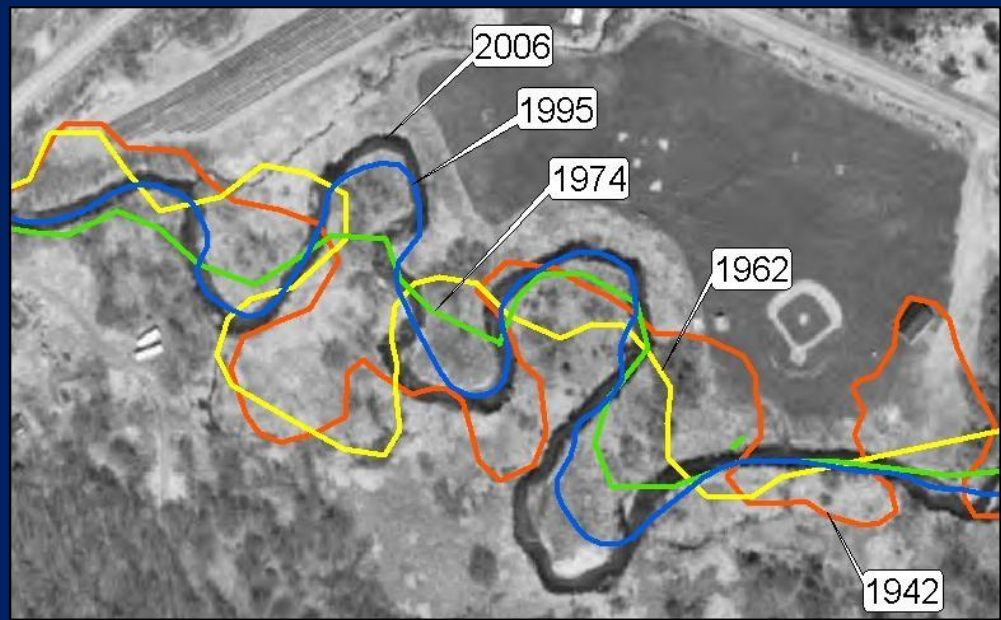
Signal that it's okay to build up to the edge of the river.



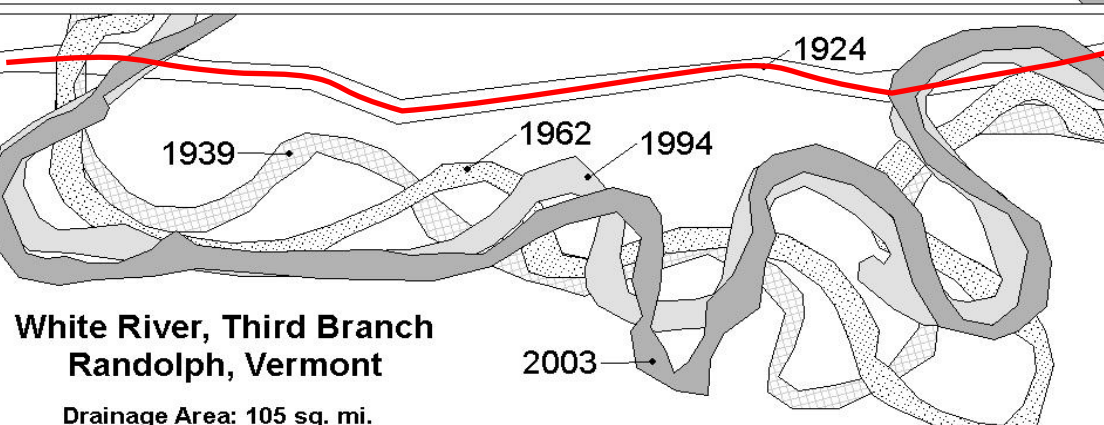
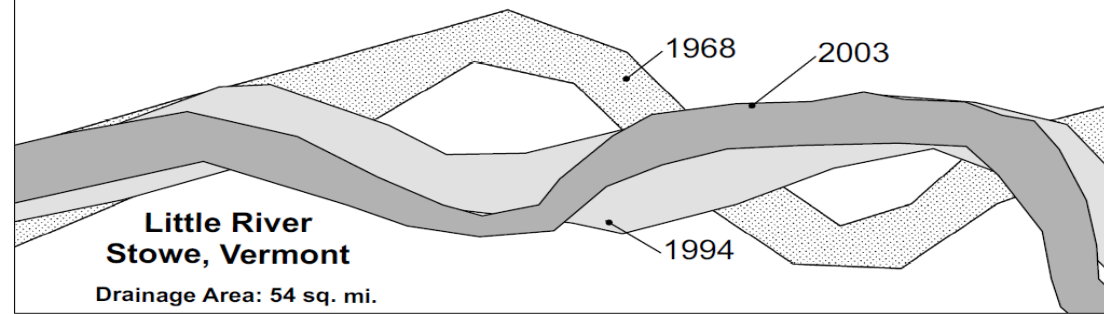
Both of these structures are mapped outside the FEMA special flood hazard area

Data and maps inform Vermont Policy

Where is Vermont siting its investments?

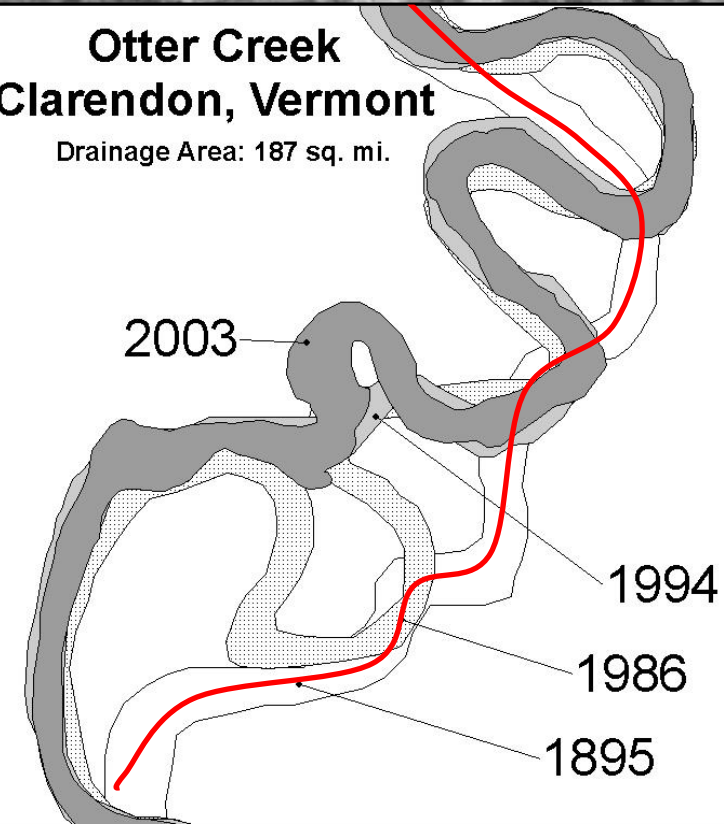


Stream Channel Meander Pattern Adjustment Over Time



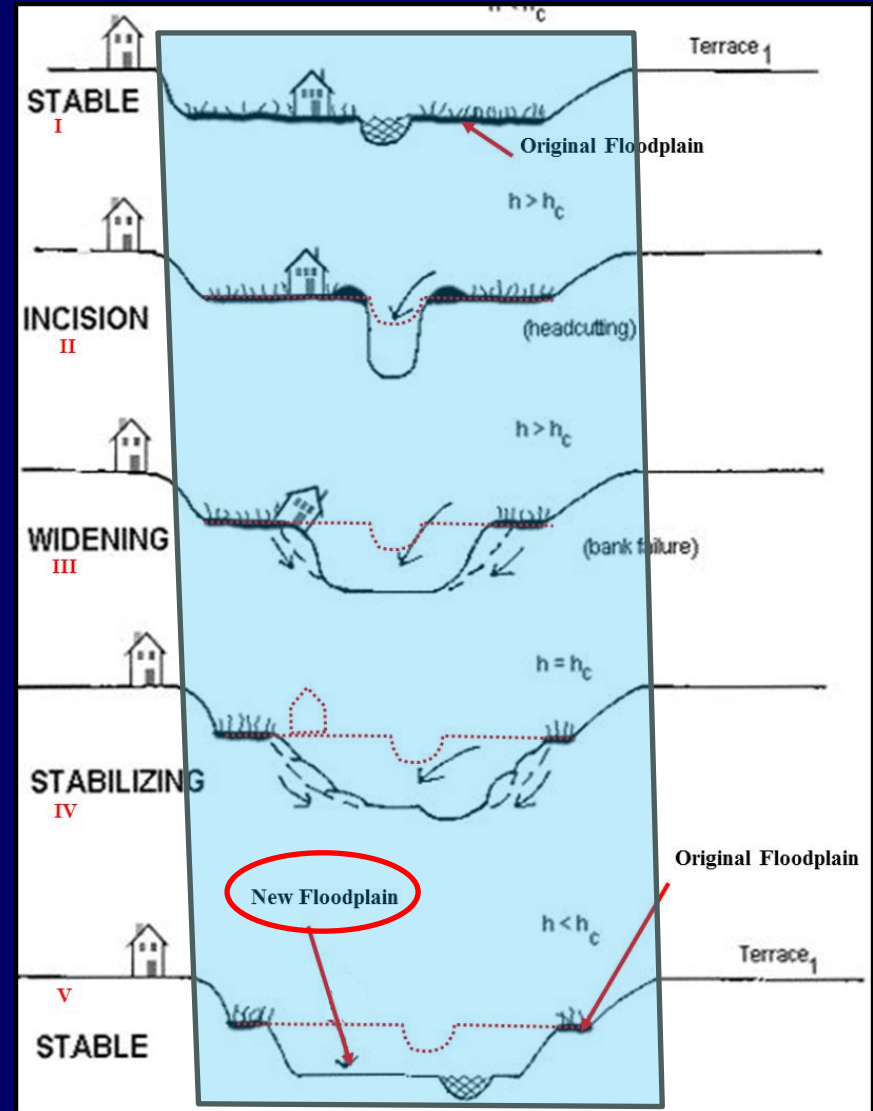
Otter Creek Clarendon, Vermont

Drainage Area: 187 sq. mi.



Act 138 (2012) promotes the protection of **River Corridors** to reduce erosion and increase storage over time.

River Corridor means the land area adjacent to a river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel and that is necessary for the natural maintenance or natural restoration of dynamic equilibrium conditions and for minimization of fluvial erosion hazards. **10 V.S.A. § 1422**



River Corridor

River Corridors using the Meander Belt Concept

Minimal area required to accommodate the meander geometry, slope, and active erosion / depositional features of a river's least erosive, vertically stable form.

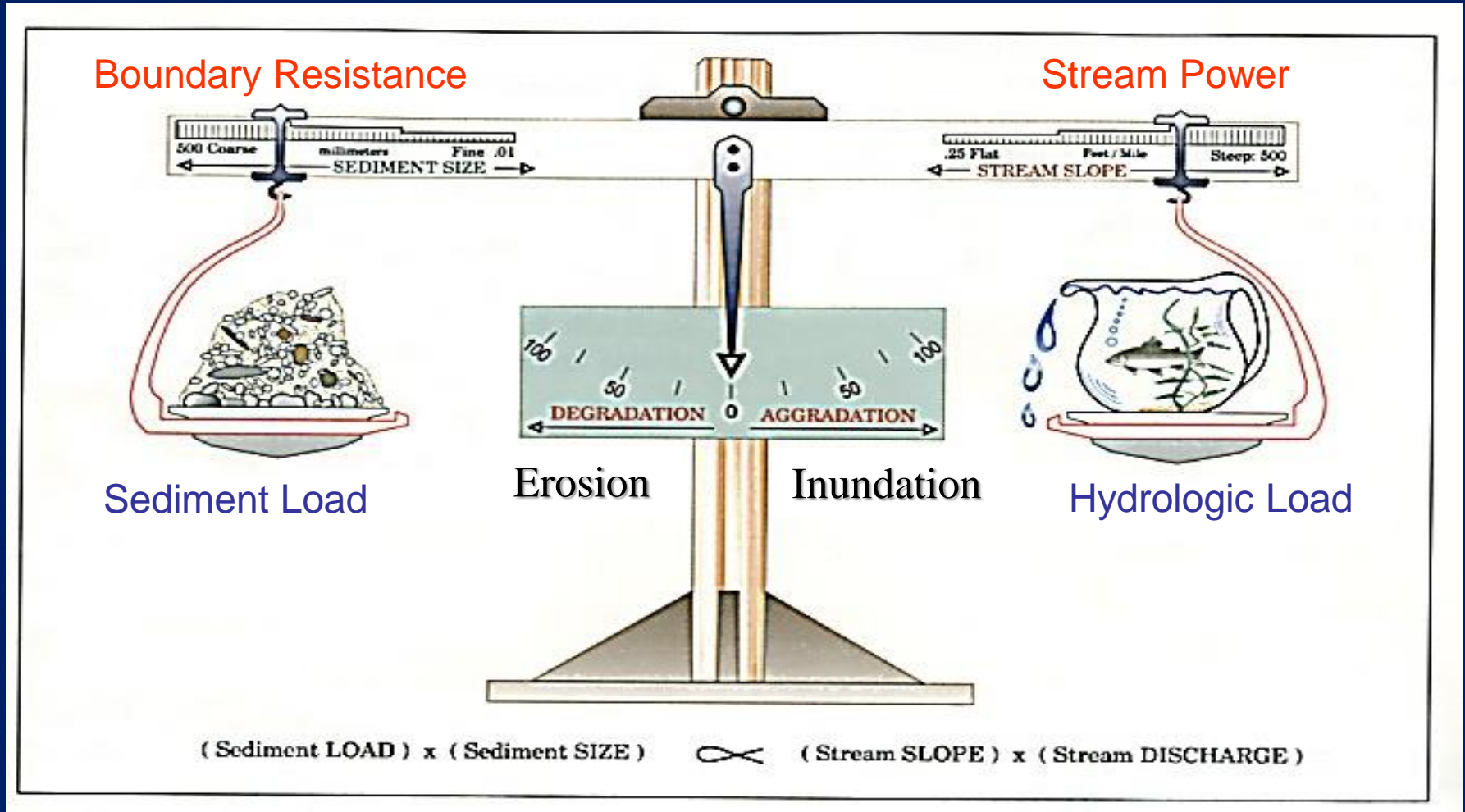
per 10 V.S.A. §1422(12)



Vertically Stable but
Laterally Dynamic

Managing Toward Dynamic Stream Equilibrium

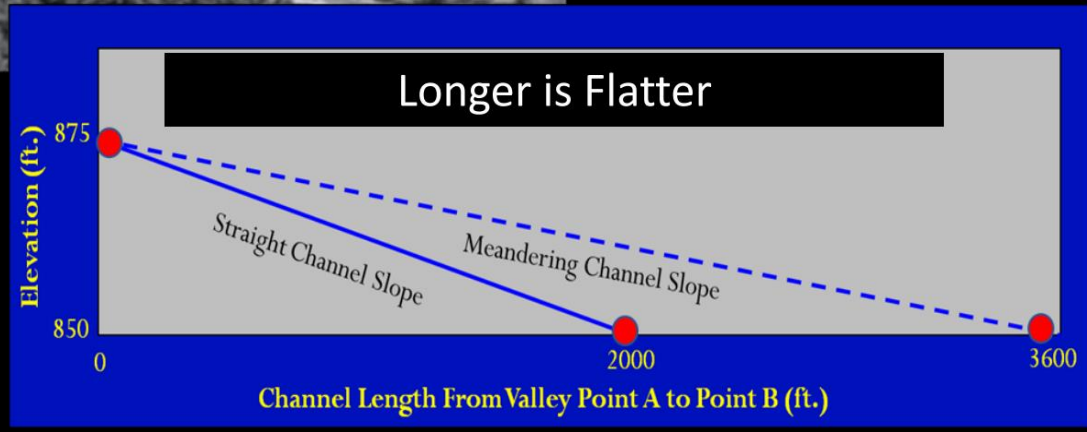
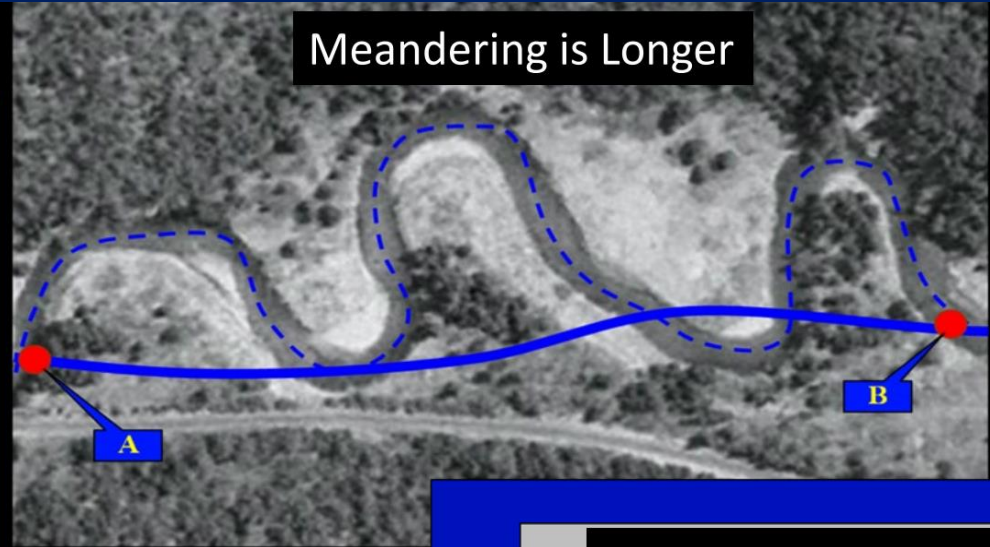
a state where erosion and flood depth are more evenly distributed



Stream Erosive Power = **Stream Slope** X Discharge (depth)

Intact Rivers and How They Work:

Slope Maintenance via Meandering

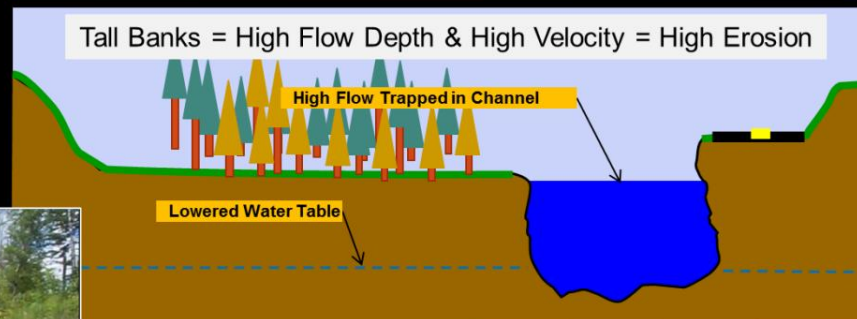
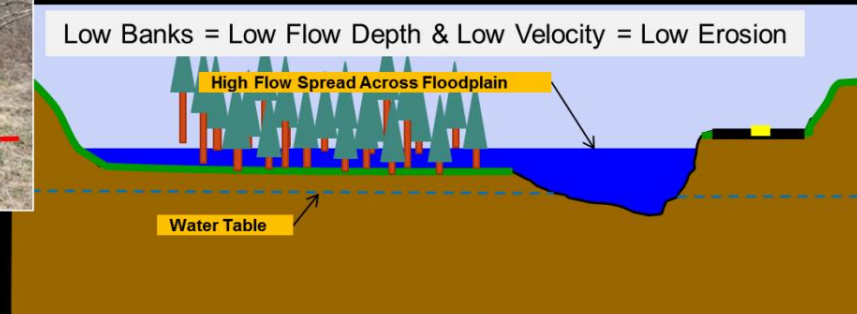


Courtesy: Shayne Jaquith, TNC

Stream Erosive Power = Stream Slope X Discharge (depth)

Intact Rivers and How They Work:

Energy Dissipation via Floodplain Connection



Courtesy: Shayne Jaquith

Erosion along historically channelized streams is the predominate form of road damage in VT



Preserve new river-formed floodplains as much as possible, and the next flood will result in less erosion and downstream flooding.

Thank You

Mike Kline

Questions?

