



Promoting Science & Evidence Based Flood Responses for Better Protection for All & Cost Savings

- **Healthy intact natural streams with good connection to floodplains are highly stable & serve as templates**



Characteristics:

- Floodway width 5-6 x bankfull width or greater
- All have a well vegetated riparian zone
- Have high biologic, aesthetic & recreational values
- Are self maintaining – minimal or no cost
- Efficiently dampen flood energy – slowing flows
- Deposit fine sediments on the floodplain
- Appropriate channel width, depth, slope, meander, streambed
- No erosion, no tree loss
- No downcutting, no deposition, no cost

9/6/11: E. Br. Ausable, Keene Valley, NY (6 days post 500 yr flood). Flows at this point -- 9-10' above base of trees
Other examples: Battenkill (all 35 miles in NYS), West Branch Ausable, Neversink (all branches)

- **Natural channel restorations fared as well as intact natural streams across NYS**



- note wide floodplain, home is well set back
- rough, well vegetated floodplain
- no bank erosion
- no down cutting
- no deposition, low to no cost
- appropriate channel dimensions, meander pattern, slope
- Located 3 miles below flood devastated Windham, NY
- Design patterned after natural stable channel
- Multiple other examples of natural stream restorations can be found across New York State

- 1/7/12: Bataviakill, Cty Rt 17, Greene County natural channel restoration ca. 2001 (4 months post historic flood)

- **Flood Reality: NY – 12 flood emergencies in Catskills in last 15 years; VT – extreme floods every 13 yrs**



- Historic flooding: Region 3, Region 4, Region 5
 - Schoharie: 114,000 cfs
 - Battenkill: 22,900 cfs **
 - E. Br. Delaware: 33,400 cfs
 - Neversink: 28,800 cfs*
 - E. Br Ausable: 33,500 cfs*
 - Ausable: 48,500 cfs*
 - Bouquet: 15,400 cfs*

- * limited or no** appreciable flood damage = no cost

- 8/29/11 Battenkill near flood crest at E. Greenwich: flood width up to .5 mi. , historic event (>100, <500yr)

- **Devastating failures of encroaching on flood plains & applying “constrain & control” measures to prevent flooding: VT ANR photos post Irene**



“Message to Towns: Encroachments on straightened and incised channels equals property loss, high and ongoing costs of managing rivers, and a loss of recovery options (\$\$\$).” (Mike Kline, VT ANR Rivers Program Manager)

- **Current US Flood damages = \$6 Billion annually -- and rapidly increasing!**

- **Misplaced reliance on traditional approaches to river management: Containing Flows within a Straigthened Channel**



Little Schoharie: DEC Region 4



John's Brook: DEC Region 5

The Shift to flood attenuation: Vermont ANR River Program; NYS Delaware County , Catskill Stream Programs

- Protect river corridors and floodplains to accommodate floods and fluvial processes
- Distribute & dissipate energy
- Store Sediment & Large Woody Debris (LWD), Use LWD in re-stabilization, Create and Maintain Habitat



VT ANR floodplain restoration – Bennington, VT

Woodland Valley flood plain restoration & channel resizing Region 3

NYS groups and agencies supporting or employing flood attenuation practices: Delaware, Greene, Chemung & Ulster Counties SWCD, NYC DEP Stream Management Program, Ashokan Watershed Alliance, US Fish & Wildlife Service, NYS DEC, New York State Council Trout Unlimited, USDA NRCS, Cornell Cooperative Extension, Ausable River Association
photo credits: Mike Kline – VT Rivers Program Manager, DEC Watershed Division), NYSCTU (John Braico, VP Resource Mgmt)