



AFTER THE STORM

Fact Sheet 17 Historic September 2013 Sedimentation Estimates

May 8, 2014

The Bear Creek Watershed Association protects and restores water and environmental quality within the Bear Creek Watershed from the effects of land use.

- Clear Creek County
- Jefferson County
- City of Lakewood
- Town of Morrison
- Aspen Park Metropolitan District
- Brook Forest Inn
- Conifer Sanitation Association
- Conifer Metropolitan District
- Denver Water Department
- Evergreen Metropolitan District
- Forrest Hills Metropolitan District
- Genesee Sanitation & Water District
- Geneva Glen
- Jefferson County School District
- Kittredge Water & Sanitation District
- Tiny Town Foundation, Inc.
- West Jefferson County Metropolitan District
- Evergreen Trout Unlimited
- U.S. Army Corps of Engineers

BCWA evaluates basin hydrology and sediment deposition

Measuring the storm alterations within a watershed can be very complex. Many physical, chemical, ecological, biological (bacteria, bugs, fish and wildlife), hydrologic, and socio-economic factors influence the “health” of a watershed. The Bear Creek Watershed is an area of land where rain and snowmelt drain into local streams, rivers, lakes, reservoirs and wetlands. Watersheds can be small or very big, depending on the number of waterbodies that are included in the definition. Determining the scale is simply a management need constrained by economic limitations. How we use land and live in our watershed alters its water resources and defines the ecosystem. Waters have classified uses (drinking water, recreation, aquatic life, and agricultural) and standards, which basically are limits when a certain parameter reaches a high-enough amount to become a pollutant. There are over 150 standards that could be measured in our watershed to determine pollutant loads. We select target parameters to help measure watershed health. Nutrient management is a big target area for the BCWA.



Bear Creek flooded and slowly drained. A major flood can vastly alter the water resources of a watershed and sometimes cause an “ecological reset”. The heavy rains and flood “flushed” nitrogen and phosphorus from the areas along the streams. The watershed nutrient concentrations in late October and November were some of the lowest values ever measured. Vast amount of sediments, including suspended sediments and bedload, are moved downstream during storm events. We have no reliable method to determine the total amount of sediment transported by the 2013 floods. We have made some best



guesses on the amounts deposited into Evergreen Lake and Bear Creek Reservoir. It is very apparent that millions of tons of sediments were moved by storm waters. There was extensive erosion throughout the watershed.

Evergreen Reservoir			
Sep-13		Oct-13	
TSS Based (SSL Load)		TSS Based (SSL Load)	
Tons/month	Cubic Yards/Month	Tons/month	Cubic Yards/Month
905	745	28	23
Estimated Bedload		Estimated Bedload	
Tons/month	Cubic Yards/Month	Tons/month	Cubic Yards/Month
13,582	11,179	142	117

Take a look at the atypical hydrology in 2013, the total estimated annual discharge

into Bear Creek Reservoir at the bottom of the watershed was above average with about **49,973** acre-feet and about **45,726** acre-feet flow through (includes **4,246** acre-feet of evaporation and infiltration). In 2012, the total discharge into the reservoir was <6,000 acre-feet. Most of 2013 flow came in September/October (**35,700 Acre-Feet**) when



Bear Creek Reservoir			
Sep-13		Oct-13	
TSS Based (SSL Load)		TSS Based (SSL Load)	
Tons/month	Cubic Yards/Month	Tons/month	Cubic Yards/Month
40,933	33,690	1,587	1,306
Estimated Bedload		Estimated Bedload	
Tons/month	Cubic Yards/Month	Tons/month	Cubic Yards/Month
1,023,331	842,248	7,933	6,529