Taking September 2013 as a Forewarning – Adaptive Co-Management to Better Prepare for the 100-Year Event

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Abstract. Bear Creek Reservoir, a U.S. Army Corps of Engineers flood control facility west of Denver, is usually maintained at a permanent pool elevation of 5558 feet. However, in September 2013 for the first time since dam closing in 1977, flood waters rose nearly 50 feet, surface area increased from 106 to 448 acres, and storage volume increase from 1,891 to 14,366 acre-feet. Two latrine vaults were submerged and both boat docks were destroyed. Much of the populated lower half of the watershed from Upper Bear Creek through Evergreen, Kittredge, Idledale, and Morrison required significant FEMA funding to repair damages to roads, culverts, streambanks, and structures along Bear Creek and its tributaries. However, this damage was caused by just five days of elevated flows of 900 to 1,200 cfs, a magnitude which may only represent a return period of about 5.5 years (an 18% probability of occurrence in any one year) according to the FEMA flood insurance study updated just this year. Even along state and county roads, some culverts and bridges remain undersized. Floodways are not always maintained to safely pass the probable 100-year event of 14,000 cfs at Morrison and of 4,000 to 6,000 cfs at the mouths of the four major tributaries. This presentation will explore ways in which Bear Creek Watershed Association member cities, counties, and districts are reconstructing to be more robust, planning future mitigation measures, and sharing what they've learned with the community to better prepare for the inevitable floods to follow, which could be much worse.