

## **An Adaptive Assessment of the Flushing Flow Needs of the Lower Poudre River, Colorado: First Evaluation**

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**Abstract.** Adaptive assessment of a riverine system is a continual learning process and probably never reaches a state of full knowledge. Adaptive assessment also includes the principle that continuous adaptation of improved knowledge to the work at hand is the normal state of affairs. The application of adaptive assessment presented in this paper is a first step in an adaptive process that uses readily available discharge measurement summary data available for some gaging stations to determine the flushing flow needs of a river. The process presented is useful 1) when little money is available for a flushing flow study and 2) in guiding more extensive studies that might be done later in the adaptive process when additional or more detailed information may be needed. In this paper, discharge measurement summary data and limited field data were used to develop a relation between a substrate movement parameter and the discharge for a USGS gage on the Poudre River above Boxelder Creek just downstream from Fort Collins, Colorado. The relation substrate movement parameter was combined with a value of the substrate movement parameter critical for movement of sand and fines known from other studies to find the discharge in the Poudre River in the Fort Collins reach required to flush sand and fines from the river. The discharge - sediment transport parameter relation determined from the analysis is  $\beta = 0.000320 Q^{0.549}$  where  $Q$  is the discharge and  $\beta$  is the substrate movement parameter. From previous studies, the critical value of the substrate movement parameter is 0.021, resulting in a flushing flow calculated to be 2050 cfs. There are 32 years of record at the Fort Collins gage with 12 years where the channel was flushed and a current run of at least 7 years without significant flushing of the channel.