

## Challenge of Baseline Hydrology Estimation at Large-Scale Watersheds

**Authors :** Can Liu, Graham Markowitz, John Balay, Ben Pratt

**Abstract :** Baseline or natural hydrology is commonly employed for hydrologic modeling and quantification of hydrologic alteration due to manmade activities. It can inform planning and policy related efforts for various state and federal water resource agencies to restore natural streamflow flow regimes. A common challenge faced by hydrologists is how to replicate unaltered streamflow conditions, particularly in large watershed settings prone to development and regulation. Three different methods were employed to estimate baseline streamflow conditions for 6 major subbasins the Susquehanna River Basin; those being: 1) incorporation of consumptive water use and reservoir operations back into regulated gaged records; 2) using a map correlation method and flow duration (exceedance probability) regression equations; 3) extending the pre-regulation streamflow records based on the relationship between concurrent streamflows at unregulated and regulated gage locations. Parallel analyses were perform among the three methods and limitations associated with each are presented. Results from these analyses indicate that generating baseline streamflow records at large-scale watersheds remain challenging, even with long-term continuous stream gage records available.

**Keywords :** baseline hydrology, streamflow gage, subbasin, regression

**Conference Title :** ICEWW 2017 : International Conference on Environment, Water and Wetlands

**Conference Location :** Toronto, Canada

**Conference Dates :** June 15-16, 2017