

Potential impacts of hydrologic changes on nutrient loads in the South Platte River Basin

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Abstract. Understanding the potential impacts of hydrologic changes on nutrient loading within a system is paramount to developing adaptation strategies. This case study investigates the impact of varying hydrologic conditions on water quality within the South Platte River Basin in northeastern Colorado. 80% of Colorado's population lives within the South Platte River Basin in addition to providing water for the most productive agricultural landscape in the state. Nutrient concentrations within the river basin depend on seasonality, land type, land use management practices, and point source inputs from wastewater treatment plants. The river basin contains mountainous, urban, and agricultural settings which, in combination with the semi-arid climate of the South Platte River Basin, produces the potential for droughts, fires, and floods to cause significant changes on the hydrology of the river. This study analyzed nutrient data from mountain, urban, and agricultural settings under various stream flow conditions which were present during the period of record. The hypotheses of this study were that water quality is related to stream flow during the time of sampling, the stream flow preceding the sampling date, as well as a relation with the dominant land cover classification of the area immediately upstream of the sampling location. The impact of extreme events, such as drought and fire, on water quality were also investigated. This talk will explore results of these investigations as well as some of the limiting factors such as data availability for long term studies in Colorado.