

Evaluating water quality ecosystem services of wetlands under climatic change

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Abstract. Potential hydrologic effects of climate change have been assessed extensively; however, possible impacts of changing climate on in-stream water quality have received little study. We assessed potential effects of climate change on water quality under present-day and varied future wetland extent in the mountainous Sprague River watershed, Oregon, USA. We utilized the hydrologic model Soil and Water Assessment Tool (SWAT) forced with distinct climate scenarios derived from downscaled General Circulation Models to assess hydrologic model outputs of flow, sediment, phosphorus and nitrogen. Model outputs were characterized by projection ensembles under present-day wetland extent and varying future wetland scenarios for the mid-21st century. Results indicate seasonal shifts in magnitude and timing of streamflow peaks and associated loads of sediment and nutrients, and provide insight into the role of wetlands in watershed-scale water quality under uncertain future climate.

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