

Impacts of Climate Variability and Change on Water Temperature

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ABSTRACT

Climate variability and change can impose significant stresses on water quality. As a barometer of stream health, water temperature is likely to be most directly affected by rising air temperature and reduced summer flows resulting from climate change. With ongoing development pressure, the Portland metropolitan area provides a good case study to investigate the implications of climate change at the regional level. We will first investigate the current patterns of water quality as they relate to climate variability for three basins with different degrees of landscape disturbance. Second, we will examine the expected changes in water quality for these basins under a range of projected climate change scenarios using an in-stream water quality model. Finally, we will further investigate which geographical area might be most vulnerable to changes in water quality. The findings of this research will provide an instructive example of the impacts of projected climate change on proactive water quality management and the potential of adaptive management in the context of future uncertainty. This study will help regional environmental planners and water resources managers assess the potential impacts of climate change on water quality and will facilitate management transitions in a period of substantial environmental and socioeconomic changes.