DEVELOPING METRICS BASED ON CHANNEL MORPHOLOGY TO CHARACTERIZE RELATIVE CONTRIBUTIONS OF TERMS IN THE HEAT BUDGET

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ABSTRACT

In the Willamette River, the present day main channel exceeds regulatory temperature thresholds during much of the late spring, summer, and early fall. During these times, the spatial and temporal distribution of cold water tends to be concentrated in geomorphic features off of the main channel. Alcoves and side channels offer thermal refuges to steelhead and salmon during periods of migration and spawning. The goal of my research is to validate the use of a nondimensional heat budget metric to predict the thermal regime of off channel habitats. Drawing on simple physical measurements from aerial photographs and past temperature and fish survey data, three distinct types of off-channel habitats will be selected. At each site, additional temperature measurements and eDNA samples will be collected and then processed to (1) relate the heat budget metric to the site's temperature profile, (2) relate heat budget results to channel morphology, vegetation presence, and floodplain age, and (3) relate temperature patterns with community assemblages. Ultimately, an increased understanding of metrics able to quantify relationships between floodplain morphology and heat budget inputs would augment our ability to identify, preserve, and restore critical habitat features.

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