**Effects of temperature regime on juvenile Chinook and Coho salmon growth in three geomorphologically distinct sub-basins of the Kenai River**

Benjamin Meyer1, Daniel Rinella2, Erik Schoen3, and Mark S. Wipfli4

1Alaska Cooperative Fish and Wildlife Research Unit, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Fairbanks, Alaska 99775; bemeyer@alaska.edu

2Alaska Natural Heritage Program, University of Alaska Anchorage, Anchorage, Alaska, 99508; djrinella@uaa.alaska.edu

3Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska Fairbanks, Fairbanks, Alaska 99775; eschoen@alaska.edu

4 U.S. Geological Survey, Alaska Cooperative Fish and Wildlife Research Unit, Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, Alaska 99775; mwipfli@alaska.edu

 Changes in air temperature and precipitation as a result of ongoing climate warming in South-central Alaska will impact juvenile salmon freshwater rearing habitat differentially on the basis of local watershed conditions. However, the extent to which landscape and hydrological characteristics such as glacial and snowmelt input support resilience to changes such as rising water temperature is not well understood. Some south-central Alaskan salmon streams already experience water temperatures well above Alaska Department of Environmental Conservation’s maximum thermal criteria of 15°C during summer months, however, the biological relevance of thermal criteria will vary by habitat, population, and watershed type. We selected three focal Kenai River tributaries – Beaver Creek, Russian River, and Ptarmigan Creek – to represent a spectrum of catchment types with differing potential levels of resiliency to climate change. Differences in elevation, precipitation, and valley slope produce a range of water habitat conditions and temperature profiles. Water temperature along with food resources are considered to be significant controls on the growth potential of juvenile salmon, however little is known about how temporal and spatial patterns in these variables influence growth of juvenile Salmon in Southcentral Alaska. In our initial field season of summer 2015, we collected diet samples and length/weight measurements from juvenile Chinook and Coho salmon along with water temperature data from throughout the three focal watersheds. Temperature, diet, and growth data are being incorporated into bioenergetics models that will allow us to determine whether growth rates of juvenile salmon are limited by food or temperature, and help inform whether current thermal criteria for these species are biologically accurate under the specific geomorphological conditions characteristic of the focal watersheds.