

3-2. Food Production and Salmon Growth (Oral-18)

## **Juvenile Pink and Chum Salmon Foraging Conditions, Growth Potential, and Distribution in Response to the Loss of Arctic Sea-Ice**

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Climate models predict the arctic to be ice-free by 2030. The loss of Arctic sea-ice will have a profound influence on Arctic ecosystems and marine resources dependent on them. Insight is provided into the potential increased utilization of the Arctic by juvenile salmon associated with the loss of sea ice by examining the foraging conditions, growth potential, and distribution of juvenile pink and chum salmon in the Chukchi Sea during the significant retreat of sea ice that occurred in 2007. Juvenile salmon were sampled in the northern Bering and Chukchi Sea as part of the United States BASIS survey with the objective of investigating implications of climate change on salmon ecology. Juvenile pink (*Oncorhynchus gorbuscha*) and chum (*O. keta*) salmon growth histories were reconstructed from scale circuli patterns, food habits were identified through diet analyses, and growth potential modeling simulations were run to quantify spatial differences in marine habitat. Large catches of juvenile pink and chum in the Chukchi Sea during early autumn 2007 reflected significant utilization of Arctic habitat and was likely in response to warm surface sea temperatures and the extensive loss of sea-ice during the summer. Growth rate was significantly higher for fish inhabiting the Chukchi Sea than those inhabiting the Bering Sea. Larval prickleback (*Lumpenus fabricii*) were heavily preyed upon in the central Chukchi Sea and zooplankton was primarily consumed in the southern Chukchi and northern Bering Sea. The Chukchi Sea is assessed through habitat-specific growth potential models in an effort to increase our understanding of how the loss of sea-ice will impact the growth and survival of salmon.