

Spatial Variability in Lipid Content and Fatty Acid Profiles of Macrozooplankton From Coastal British Columbia, Canada

Daniel P. Bevan¹, John F. Dower^{1,2}, Marc Trudel³, and Asit Mazumder¹

¹ Department of Biology, University of Victoria, PO Box 3020 STN CSC, Victoria, BC V8W 3N5, Canada

² School of Earth and Ocean Sciences, University of Victoria, PO Box 3065, STN CSC, Victoria, BC V8W 3V6, Canada

³ Pacific Biological Station, Fisheries and Oceans Canada, Nanaimo, BC V9T 6N7, Canada

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This study explores the relationship between food quality and Pacific salmon production through impacts on the growth and overwinter survival of juvenile salmon during their first year at sea. Recent development in the use of fatty acids as bioindicators has drawn attention to the importance of food quality and nutritional value in the productivity of marine ecosystems and that prey quality may be as important as prey abundance in transferring energy through food webs. The concentrations of polyunsaturated fatty acids, such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) within an organism, have become popular proxies for estimating food quality. Here we examine spatial variability in fatty acid profiles, key fatty acid ratios, and overall lipid content across a range of zooplankton species commonly found in coastal British Columbia, Canada. Selection of target species, which included copepods, amphipods and euphausiids, was motivated by their prevalence across a wide area, ease of capture, and importance in the diet of juvenile salmon. Samples were collected from bongo tows at more than 100 locations in the waters surrounding Vancouver Island and in more northern coastal areas between May and September 2010. Sampling allowed for intraspecies comparisons over multiple spatial scales. These results explore how variability in the presence of critical fatty acids can potentially alter the efficiency of energy transfer to juvenile salmon across ecosystems.