# DEPTH GRADIENTS IN FOOD WEB PROCESSES LINKING LARGE LAKE HABITATS

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In large lakes around the world, shifts in ecological communities are often associated with water depth. This suggests that there may be concomitant changes in patterns of resource allocation. Using Lake Superior as an example, we explored this idea through stable isotope analyses of 14 major fish taxa. Patterns in carbon and nitrogen isotope ratios revealed use of littoral and profundal benthos among individuals of most taxa analyzed. Use of benthos was strongest among nearshore demersal species and weakest among planktivores, and declined with depth of habitat. Isotope mixing model results indicated that benthic food web pathways were most important in nearshore fish species, whereas offshore pelagic and profundal species used planktonic pathways. These patterns appear to be governed by two key processes: high benthic production in nearshore waters and diel vertical migration among offshore invertebrates and fish. These characteristics are shared with the Great Lakes of Africa, Russia, and Japan. Support of whole-lake food webs through trophic linkages among pelagic, profundal, and littoral habitats appears to be integral to the functioning of large lakes.