

Title: Water quality conditions and food web structure in Chequamegon Bay

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Abstract: Stable isotopes of carbon and nitrogen are powerful tools for tracing human- and watershed-derived nutrients and energy in coastal ecosystems. We used carbon and nitrogen stable isotope analysis to identify externally- and internally-produced nutrients and energy supporting fish larvae somatic growth in three Lake Superior coastal river-wetland complexes, including Chequamegon Bay. With respect to anthropogenic nutrient inputs, fish larvae $\delta^{15}\text{N}$ responded at within watershed scales to waste water inputs; however, expression at specific locations within a coastal system was strongly influenced by local hydrologic processes. With respect to externally-produced energy, most fish larvae obtained some energy from food sources originating outside the region where the fish larvae were collected. Our findings demonstrate that these coastal habitats do function as a “mosaic”, wherein proximal and some more distal habitats and ecosystems contribute to fish growth during a critical life stage.