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Transport by Internal Waves Near the Boundary of a Lake[1] CHRIS REHMANN, Iowa State University, DANIELLE WAIN, National University of Ireland at Galway — Because fluxes in stratified water bodies are often controlled by turbulence and mixing at sloping boundaries, determining how the mixed fluid moves from the boundary to the interior is important for estimating basin-wide transport of heat and other scalars. We conducted a tracer-release experiment in a lake that illustrates the importance of advection and dispersion driven by internal waves. Motivated by those observations, we developed an analytical model of transport by internal waves. For tracer releases near the boundary, the velocity field resulting from vertical mode-2 waves consists of oscillatory strain, the oscillating analog of flow near a stagnation point. The horizontal and vertical length scales of the tracer cloud oscillate about the values in the base case with no waves, and the deviation from the base case depends on the ratio of the amplitude of the isotherm displacements and the water depth, as well as the phase at which the tracer was injected. The effect of different modes and the implications for basin-scale transport will also be discussed.

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