Abstract View

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Effects of Variable and Anisotropic Diffusivities in a Steady-State Diffusion Model

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ABSTRACT

The hypothesis that variations in eddy diffusivity may account for some aspects of the observed distributions of oceanic scalars is examined by generating solutions to the diffusion equation with spatially variable and/or anisotropic eddy diffusivity. In particular, the solutions generated here demonstrate how a purely diffusive field, with variable and anisotropic diffusion, can itself generate tongue-like property distributions. Although tongues of various oceanic properties have often been interpreted as due primarily to advective effects, such interpretations must be viewed with caution when the gradients of eddy diffusivity are comparable to, or greater than, the local velocity field.