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A Theory of Upwelling Over the Shelf Break

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ABSTRACT

The three-dimensional circulation produced in a homogeneous ocean by a steady wind stress is investigated when the bottom topography contains a discontinuity in gradient, such as occurs at the edge of the continental shelf. A shear layer is formed above the edge of the shelf in which upwelling is significant. The vertical transport in the shear layer can be sufficient to produce a surface convergence zone in the vicinity of the shelf.

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