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Laboratory Study of Coastal-Trapped Wave (CTW) Interaction with Submarine Canyon SERGEY SMIRNOV, Texas Tech University, ALEXANDER YANKOVSKY, Nova Southeastern University, DON BOYER, Arizona State University, PETER BAINES, The University of Melbourne — CTW propagation along the continental slope and its subsequent interaction with the submarine canyon was investigated experimentally. Our observations demonstrated that CTW propagates along the continental slope with the strongest currents being concentrated near the shelf break. The topographic irregularity was strong enough to promote wave scattering. Flow characteristics in the canyon were found to be sensitive to the relative value of the Burger number. When the latter was very large (strong stratification), no variations in the wave spatial structure were observed in the canyon region. The scattering effect becomes significant at moderate values of the Burger number (of the order of unity). It was shown that stratification can eliminate backward propagating modes and limit the number of transmitted modes, forcing the flow to generate highly-energetic evanescent modes in order to adjust to the variations of the topography. Evanescent modes, which are characterized by large amplitudes and small length scales, cause amplification of the velocity field and strong variation in the spatial structure of the flow in the vicinity of the scattering region. Eventually strong mesoscale flows are generated in the form of a cyclonic eddy trapped inside the canyon region influencing the transport of nutrients and pollutants in the coastal region.

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