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C. N. K. Mooers

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Coastally trapped waves, baroclinic eddies, internal tides and oceanic fronts at the shelf break: their implications for exchanges between shelf and oceanic waters [abstract only]

By C. N. K. Mooers

Department of Oceanography, Naval Postgraduate School, Monterey, California 93940, *U.S.A.*

The seaward edge of the continental shelf, or shelf break, is the locus of strong physical variability in the overlying waters. Near the shelf-break, surface tides scatter energy into internal modes that propagate both onshore and offshore and produce strong vertical shears. Atmospheric forcing generates subinertial-frequency topographic Rossby waves, which propagate parallel to the coastline and are strongly trapped near the shelf break. Relative to the sloping topography, wind-driven coastal upwelling generates prograde fronts, and river run-off generates retrograde fronts. Located near the shelf break, these fronts are boundaries between oceanic and coastal waters. Oceanic eddies impinge on, and move along, the shelf-break entraining coastal waters. Eddies may also be shed by shelf-break fronts. Submarine capes and canyons contort the shelf break and significantly modify the enumerated processes. Based on observational evidence from a few coastal régimes, the shelf break is a zone where several mesoscale and synoptic-scale processes operate and probably produce significant turbulent transfers.