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Department of Marine Sciences
Presents a Seminar By

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How is basin scale circulation connected to the mean flows on the Mid-Atlantic Bight and other western boundary shelves

The long-timescale ("mean") currents over the shelves of the western-boundaries of oceans are generally equatorward from high-latitudes until the separation point of the adjacent western boundary current. Equatorward of that point, the flows are generally poleward. The shelf-currents carry regionally and even globally important fluxes of freshwater, heat and nutrients. Nonetheless the origin of these mean flows has not been clear; for example along the Mid-Atlantic Bight they cannot be explained by either mean winds or density gradients along these shelves.

Numerical modeling results will be presented suggesting that these mean currents are largely driven by the western boundary currents along the edge of these shelves, and thus ultimately by the wind-stress curl over the adjacent ocean basins. Idealized analytical models clarify the dynamics linking the deep ocean and shelf circulation and quantify the relationship between wind-stress curl over the deep ocean, deep ocean stratification, and the strength of mean flows on adjacent shelves. The analytic model predictions are consistent with observations of Mid-Atlantic Bight currents, and suggest how shelf currents may change as future climate changes the wind-stress and heating/cooling of the Atlantic Ocean.

These results are consistent with earlier work showing that the shelf circulation at a point is not driven by deep-ocean phenomena immediately offshore of that point. Only by examining basin-scales processes can the influence of forcing over the deep ocean on shelf circulation be understood.

Host: Melanie Fewings
Time & Date: 11:00 am, Friday, November 18, 2016
Place: Marine Sciences Building, Seminar Room 103

Please see this page for cancelations and additional seminar information, email marinesciencesseminars@uconn.edu, or call 860-405-9152 or 860-405-9151