



## Abstract View

[Volume 9, Issue 6 \(November 1979\)](#)

### Journal of Physical Oceanography

Article: pp. 1144–1154 | [Abstract](#) | [PDF \(640K\)](#)

## Low-Frequency Current Variability on the Southern Mid-Atlantic Bight

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(Manuscript received April 9, 1979, in final form August 6, 1979)

DOI: 10.1175/1520-0485(1979)009<1144:LFCVOT>2.0.CO;2

### ABSTRACT

Low-frequency current variability on the continental shelf, 84 km off the mouth of the Chesapeake Bay, was examined from 4-month (mid-March to June 1975) current, sea level and meteorological records. Taking into account the seasonal change in wind stress and stratification, the record was divided into two 60-day periods. In both periods, the transient alongshore currents were barotropic and coherent with sea level fluctuations.

During the first period (March and April 1975), winds were in the east–west direction, and the shelf water was homogeneous. At time scales longer than 4 days, sea level was a large-scale feature (coherent over the entire Mid-Atlantic Bight). At shorter time scales, sea level was driven by the local, alongshore wind. In contrast, the cross-shelf current, which was mainly barotropic, was driven by the alongshore wind at all time scales.

During the second period (May and June 1975), winds were in the north-south direction and the shelf water was stratified. Sea level was mainly driven by the local alongshore wind at all time scales. The cross-shelf current, which was baroclinic at time scales longer than 4 days, and barotropic at shorter time scales, was also driven by the alongshore wind.

The difference in response characteristics of the two periods indicate that circulation on the southern Mid-Atlantic Bight is strongly affected by local wind forcing, nonlocal effect, density stratification and the duration of alongshore wind.

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