Abstract View

Volume 14, Issue 12 (December 1984)

Journal of Physical Oceanography
Article: pp. 1893–1900 | Abstract | PDF (484K)

Observations of Low-Frequency Variability in Great South Bay and Relations to Atmospheric Forcing

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(Manuscript received December 20, 1983, in final form September 6, 1984)

DOI: 10.1175/1520-0485(1984)014<1893:OOLFVI>2.0.CO;2

ABSTRACT

Sea level and current data collected around Great South Bay, New York during December 1979 are examined in conjunction with atmospheric data for evidence of wind-forced, low frequency variability in the Bay and on the adjacent shelf. The subtidal sea level along the coast was found to be highly coherent from Sandy Hook to Montauk Point, with a single empirical mode accounted for more than 97% of the total variance. These coherent fluctuations were forced primarily by longshore winds (along 250–070°T) through the coastal Ekman effect. The sea level within the Bay exhibited large and spatially coherent subtidal fluctuations as a result of a strong coupling with the adjacent shelf. The characteristic volume exchange associated with this Bay-shelf coupling was an active simultaneous inflow or outflow through both ends of the Bay (with fluctuations in excess of 20 cm s^{-1}) in response to the rise or fall of coastal sea level induced by longshore winds.