



## Abstract View

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# A Comparison of Long Coastal Trapped Wave Theory with Observations off Peru

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### ABSTRACT

The agreement between coastal trapped wave theory and observation is studied for the case of observations made off Peru during the 1977 CUEA JOINT-II experiment. Wave properties are calculated using a numerical model with realistic, horizontally uniform stratification and realistic bottom topography. These properties are then explored as a function of the ratio of the first internal Rossby radius of deformation to the shelf-slope width. The agreement of observed and calculated first-mode, free wave phase speeds ( $230 \text{ cm s}^{-1}$ ) is excellent, while modal structures agree more poorly. A forced wave calculation, using observed winds and currents as input, is used to hindcast alongshore currents and sea level in the frequency band where Smith (1978) observed free coastal trapped waves during 1977. The model suggests that most of the observed sea level and alongshore velocity fluctuations in the 5–10 day period band are due to free waves originating equatorward of  $5^\circ$ 's, while winds between  $5^\circ$ 's and  $15^\circ$ 's contribute little to the observed variance. Finally, free coastal trapped wave, calculations are briefly compared with CUEA observations from off Northwest Africa and Oregon. Generally, the wave calculations appear to be a useful tool in interpretation of the field observations.

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