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# Evaluation of Frictional, Wind-Forced Long-Wave Theory on the West Florida Shelf

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### ABSTRACT

Clarke and Van Gorder have recently formulated a model describing the large-scale, low-frequency response of continental shelf waters to synoptic-scale wind stress in terms of a sum of forced waves. The model includes realistic friction and time dependence and provides an efficient method for calculating the response. Evaluation of the model using West Florida Shelf data gave the following results.

(i) The model successfully predicts both the coastal sea level and alongshore velocity component.

(ii) The West Florida Shelf coastal pressure field is dominated by the first mode and can be understood as the sum of a forced wave which travels with the southward-propagating wind stress and a free wave generated at the Florida Keys.

(iii) Almost all the wind-induced energy on the West Florida Shelf is due to the wind forcing acting on West Florida Shelf waters. However, a small but significant energy flux appears to enter the West Florida Shelf from the caucous Florida shelf wave guide.

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