



## Abstract View

[Volume 13, Issue 3 \(March 1983\)](#)

### Journal of Physical Oceanography

Article: pp. 512–523 | [Abstract](#) | [PDF \(997K\)](#)

# Resonant Topographic Response of Nearshore Currents to Wind Forcing

**T.J. Simons**

*National Water Research Institute, Canada Centre for Inland Waters, Burlington, Ontario, Canada L7R 4A6*

(Manuscript received August 3, 1992, in final form November 3, 1982)

DOI: 10.1175/1520-0485(1983)013<0512:RTRONC>2.0.CO;2

### ABSTRACT

Model calculations and current meter observations are analyzed in the spectral domain and in the time domain to investigate effects of topographic waves on the response of nearshore currents to wind. The spectral response is computed for a shelf forced by a progressive atmospheric wave, and effects of friction and alongshore depth variations are considered. Comparisons are made with results for standing atmospheric waves and with the response of closed basins forced by winds uniform in space and periodic in time. It is found that coastline curvature is rather unimportant for the scales under consideration, and that the alongshore wind component represents the crucial forcing. Spectral model results are then compared with current meter spectra to show the resonant topographic wave character of the response of currents to wind.

Time series of observed and computed nearshore currents are compared, and the alongshore momentum balances are considered for models with and without topographic wave effect. It is found that simple models may produce results which seem comparable to those obtained from more complete models, but it is concluded that such simple models are basically erroneous in concept.

#### Options:

- [Create Reference](#)
- [Email this Article](#)
- [Add to MyArchive](#)
- [Search AMS Glossary](#)

#### Search CrossRef for:

- [Articles Citing This Article](#)

#### Search Google Scholar for:

- [T.J. Simons](#)



© 2008 American Meteorological Society [Privacy Policy and Disclaimer](#)  
Headquarters: 45 Beacon Street Boston, MA 02108-3693  
DC Office: 1120 G Street, NW, Suite 800 Washington DC, 20005-3826  
[amsinfo@ametsoc.org](mailto:amsinfo@ametsoc.org) Phone: 617-227-2425 Fax: 617-742-8718  
[Allen Press, Inc.](#) assists in the online publication of *AMS* journals.