

Assimilating Data into a Circulation Model

Final Report for ONR Project #:N00014-02-1-0212

Submitted by

Dr. Jennifer Shore and Dr. Thomas Lippmann

The Ohio State University
Byrd Polar Research Center
1090 Carmack Road
Columbus Ohio 43210-1002

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Principal Investigators: Dr. Jennifer Shore and Thomas C. Lippmann

**The Ohio State University
Byrd Polar Research Center
1090 Carmack Road
Columbus Ohio 43210-1002
Email: Lippmann.2@osu.edu**

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The OK model is a depth- and phase-averaged nearshore circulation model based on the shallow water horizontal momentum and continuity equations with wave forcing, bottom friction, and lateral mixing. In this work, observations of surface flows are assimilated into the model using the TDAP nudging approach following the work of Oke, *et al.*, 2004, *J. Geophys. Res.*, **107**(C5), 5-25). Presently, the assimilation scheme has been tested with a subset of the NCEX data. A paper is under preparation for submittal intended for the Journal of Geophysical Research. Methods learned under this grant are being extended for use with other nearshore circulation models including Delft3d under continued ONR funding.

The following is a list of publications and presentation supported by this grant.

Publications:

Shore, J., T. J. Kassebaum, and T. C. Lippmann, 2005, PC based analog video data collection technique for nearshore waves and currents, *J. Ocean. Atmos. Tech.*, sub judice.

Presentations at National and International Meetings:

Lippmann, T. C., 2004, Surface currents in the nearshore, *ONR progress review northeast region*, Woods Hole, MA.

- Shore, J., T. C. Lippmann, and J. Long, 2004, Assimilation of surface currents in a nearshore circulation model, *Trans. Amer. Geophys. Union*.
- Lippmann, T. C., D. Welsh, and J. Shore, 2004, Video-derived surface current measurements during NCEX, *Trans. Amer. Geophys. Union*.
- Lippmann, T. C. , D. Welsh, and J. Shore, 2002, Observations of mean and oscillatory surface flow in the surf zone, *Trans. Amer. Geophys. Union*, 83(47), F717..
- Lippmann, T. C., and J. Shore, 2001, Video-based observations of surface currents in the surf zone, *Trans. Amer. Geophys. Union*, 82(47), F617.