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Frontal features of the Columbia River plume seen from a high-resolution non-hydrostatic model

Fengyan Shi[1], Tian-Jian Hsu[2], James T Kirby Jr[3], Carmine C Chickadel[4], Gordon Farquharson[5] and Craig L McNeil[4], (1)University of Delaware, Center for Applied Coastal Research, Newark, DE, United States, (2)University of Delaware, Newark, DE, United States, (3)Univ Delaware, Newark, DE, United States, (4)Applied Physics Laboratory University of Washington, Kenmore, WA, United States, (5)University of Washington, Seattle, WA, United States

Abstract Text:

Airborne data measured during the recent RIVET II field experiment has revealed that horizontally distributed thermal fingers regularly occur at the Mouth of Columbia River (MCR) during strong ebb tidal conditions. The non-hydrostatic coastal model, NHWAVE, was able to reproduce those features as the computational grid was refined to ~10 m. Model results indicate that large amplitude Kelvin-Helmholtz instabilities are generated in association with an internal hydraulic jump, which forms as the plume moves over bathymetric sills, and with location and orientation controlled by a lateral boundary inclined to the plume front. Simulation results indicate that the Kelvin-Helmholtz billows have sufficiently large amplitudes to interrupt the water surface, causing prominent linear features on the surface as indicated in thermal images. The current field in the interrupted region is modulated by the frontal structures, indicated by the vorticity field calculated from both the numerical model and data measured by the microASAR.

Session Selection: Nearshore Processes

Title: Frontal features of the Columbia River plume seen from a high-resolution non-hydrostatic model
Submitter's E-mail Address: fyshi@udel.edu
Preferred Presentation Format: Assigned by Program Committee (Oral or Poster)
Scheduling Request: Please schedule it after the talks about RIVET II field measurements

First Presenting Author

Presenting Author

Fengyan Shi

Primary Email: fyshi@udel.edu
Phone: 3028312449

Affiliation(s):

University of Delaware
Center for Applied Coastal Research
Newark DE (United States)

Second Author

Tian-Jian Hsu

Primary Email: thsu@udel.edu
Phone: (781)335-6143

Affiliation(s):

University of Delaware
Newark DE 19716-0000 (United States)

Third Author

James T Kirby Jr

Primary Email: kirby@udel.edu
Phone: (302)831-2438

Affiliation(s):

Univ Delaware
Newark DE 19716-0000 (United States)

Fourth Author

Carmine C Chickadel

Primary Email: chickadel@apl.washington.edu

Affiliation(s):

Applied Physics Laboratory University of Washington
Kenmore WA (United States)

Fifth Author

Gordon Farquharson

Primary Email: gordon@apl.uw.edu
Phone: (206)685-1505

Affiliation(s):

University of Washington
Seattle WA 98115-0000 (United States)

Sixth Author

Craig L McNeil

Primary Email: cmcneil@apl.washington.edu
Phone: 2065432157

Affiliation(s):

Applied Physics Laboratory University of Washington
Kenmore WA (United States)

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