DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Inner Shelf Mixing: Development and Broad Integration of a New Adaptive Turbulence-Measuring System to Quantify Nonlinear Transport Mechanisms

James N. Moum
Jonathan D. Nash

College of Earth, Oceanic & Atmospheric Sciences
Oregon State University
Corvallis, OR 97331-5503
ph: (541) 737-2553 fx: (541) 737-2064 email: moum@coas.oregonstate.edu
http://mixing.coas.oregonstate.edu/
Award #: N00014-15-1-2466

LONG-TERM GOALS

The long-term goal of this program is to understand the physics of small-scale oceanic processes and how they affect the larger scales of ocean circulation. Ongoing studies within the **Ocean Mixing Group** at OSU emphasize observations, interaction with turbulence modelers and an aggressive program of sensor / instrumentation development and integration.

OBJECTIVES

A conceptually new type of process experiment is proposed in which multiple, identical and inexpensive elements of a turbulence-measuring system are distributed throughout the experimental domain on all practical stationary or mobile vehicles. Data will be centrally analyzed, processed data returned to PIs and the sum total of the data assessed in an experimental space/time synthesis of physical processes.

APPROACH

This project will involve construction of 2 prototype GustT system elements followed by construction of an 80-element system (funded separately by DURIP), and hosting of vehicle system field tests in summers 2016, 2017. Following a successful field experiment in late 2017, experiment PIs will be provided with processed data from GustT elements and we will produce and investigate an unprecedentedly-detailed spatial map and timeline of mixing, vertical transports, bottom stresses and turbulence losses on the inner shelf.

WORK COMPLETED

Nothing to report yet.

RESULTS

Nothing to report yet.

IMPACT/APPLICATIONS

The instrumentation to be constructed in this project follows successful developments in chipod technology (Moum & Nash, 2009) and the implementation of pitot-static tubes designed to measure ocean speed and turbulence on moorings (Moum, 2015). System miniaturization to aid in adaptability for a broad range of platforms is intended to provide for greater usage in the community.

RELATED PROJECTS

This project will be closely associated with all of the individual DRI observational components. Precise associations will be determined at DRI kickoff meeting in early November 2015 to be attended by PI, engineer and postdoc.

REFERENCES

Moum, J.N., 2015. Ocean speed and turbulence measurements using pitot-static tubes on moorings. *J.Atmos. Oceanic Technol.* 32(7), 1400-1413, doi:10.1175/JTECH-D-14-00158.1.

Moum, J.N. and J.D. Nash, 2015. Mixing measurements on an equatorial ocean mooring, *J.Atmos. Oceanic Technol.* 26, 317-336.