A National Oceanographic Partnership Program Award

Long Term Surface Salinity Measurements

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Long-term goals

Our long-term goal is to establish a reliable system for monitoring surface salinity around the global ocean. Salinity has a great influence on air-sea interaction and is believed to have potential for improving climate forecasts if an observation system can be developed.

Objectives

This project seeks to develop a new internal field conductivity cell that can be protected from biological fouling for two years. Combined with a temperature sensor, this foul-proof cell can be deployed widely on surface drifters. A reliable *in-situ* network of surface salinity sensors will be an important adjunct to the planned salinity sensing satellite to be deployed by NASA in a few years.

Approach and work plan

A new internal-field conductivity cell has been developed by N Brown, along with new electronics. The basic concept has been proven with a plastic prototype sensor with sophisticated electronics for a high resolution CTD. A simpler (lower cost) circuit has been designed for this application that will soon be constructed by electrical engineer R. Petitt. A new design of the conductivity cell that includes antifouling protection is being prepared by mechanical engineer F. Thwaites. Mr. A.Walsh of our commercial partner E-Paint is preparing and testing time-release formulations of antifoulants for our application. Mr. G. Williams of partner Clearwater Instrumentation is advising on power and communication issues for deployment of these sensors on surface drifters. This year we will be completing the design, constructing hardware and beginning the performance tests on the new sensors.

Work Completed

As funding began only ~6 months ago, we have only accomplished design work to date.

Results

The basic concepts of the new sensor have recently been demonstrated for another application in a parallel development, so we are confident that our design will work as planned.

Impact and Applications

Economic Development

The development and widespread deployment of a stable salinity sensor for the upper ocean will lead to an improved understanding of the role of the oceans in the climate system. Theory tells us that this implies improved predictability of decadal climate change, which would have tremendous societal benefits.

Quality of Life

Sea surface salinity is a direct indicator of changes in the global water cycle, which is the major climate change issue of concern to society. It is also a key factor in the potential for abrupt climate change due to collapse of the thermohaline circulation. A better understanding of climate and improved climate forecasts would impact farming and fisheries, and greatly improve planning for water use and energy demand.

Transitions

Economic Development

It is expected that the new sensor, once completed, will be transitioned to a commercial product by licensing to an appropriate manufacturer.