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# **Lagrangian Measurements of Velocity and Upper Ocean Temperature And Salinity Fields in the Sea of Japan**

Stephen C. Riser

School of Oceanography, Box 357940

University of Washington

Seattle, Washington 98195

Phone: 206-543-1187 Fax: 206-329-0858 Email: [riser@ocean.washington.edu](mailto:riser@ocean.washington.edu)

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<http://flux.ocean.washington.edu>

## **LONG-TERM GOAL**

The long-term goal of this project is to better understand the properties of the upper portion of the water column in the Japan Sea. It is important to understand the seasonal cycle in the upper 1000 m of the Japan Sea: how the Sea stratifies in spring and summer and how it forms a mixed layer in fall and winter, sometimes with deep convection occurring.

## **OBJECTIVES**

I want to be able to study the circulation and hydrography of the upper 1000 m of the Japan Sea over at least a few complete seasonal cycles in order to understand the process of mixed-layer formation and destruction there. In some ways the Japan Sea behaves as a subtropical ocean, and in other ways it is more like a subarctic one; as a result, it is a useful laboratory for studying many oceanographic processes that occur throughout the world ocean. I plan to use PALACE floats in this study, and the work discussed here will fit into a larger program in the Japan Sea with about 20 PIs.

## **APPROACH**

I plan to deploy about 40 PALACE floats in the western Japan Sea during the summer of 1999. These floats will be deployed from the Russian research vessel *Professor Khromov* from the FERHRI laboratory in Vladivostok. These floats will cycle between the sea surface and 1000 m depth at approximately 10 days intervals and will collect profiles of temperature and salinity during their ascent phase on each cycle. In all, about 1500 profiles per year will be collected this way. This will provide good coverage of the Japan Sea, even in the winter season. All of the results will be made available in real-time via the ARGOS system and a web page. I am presently doing similar work in the N. Atlantic, and these results can be viewed on the web at <http://flux.ocean.washington.edu>. Of the 40 floats that will be deployed, about 35 will be purchased with funds from this grant (DURIP). The remainder will be purchased using funds from a separate ONR grant.

## **WORK COMPLETED**

The PALACE floats for this work have been ordered from Webb Research, Inc., and delivery of the first floats has taken place. We carry out the final assembly at UW, as well as calibration, ballasting, and preparation for shipping. The remainder of the floats will be delivered to UW in the next 4 months. Most of the planned deployments will take place inside the Russian EEZ in the Japan Sea. In

order to carry out this work, clearance has been requested from the Russian government, and I have been informed that there is a good chance of approval. The instruments will be deployed by Russian scientists; no US personnel will be allowed to participate in the cruise. Several Russians will visit Seattle in January in order to be instructed in the use of these instruments. I sailed on the vessel *Professor Khromov* in the Okhotsk Sea during the summer of 1998 and found it to be an adequate platform for the work planned here.

## **RESULTS**

The field work for this project begins in 1999, so there are no concrete results or data from this project at this time.

## **IMPACT/APPLICATION**

There are none yet, but I think that once people see the impact of real-time views of the upper ocean in the Japan Sea, in all seasons, the application for modeling and other logistical needs will become obvious. In the N. Atlantic, our work has already had applications in models of climate change and in assessing the results of hurricanes.

## **TRANSITIONS**

None yet.

## **RELATED PROJECTS**

A number of other investigators are also working on the Japan Sea project. I have worked most closely with Prof. Lynne Talley of Scripps, who will be chief scientist on several Japan Sea hydrography/tracer cruises and is also working closely with the Russians to insure that this work is successful.