OCEAN DRIFTER PROJECT

by

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Using Erik Mollo-Christensen's Director's Discretionary Funding, four drifting buoys were fabricated in the Code 674 mechanical laboratory from mostly local hardware plus animal locating transmitters made by Telonics in Arizona. The first two working models were dropped from a Wallops aircraft, to test the mechanical integrity and to test the ability of the whole system to withstand the drop and provide usable data. There are two temperature sensors on board, one to measure sea surface temperature and the other to measure air temperature. An on board computer controls the transmissions, sending three water temperature readings for each air temperature reading in order to differentiate one from the other after data reduction. Chuck Mason is the Project Manager; Pete Leone, mechanical engineering; Max Strange, electronic interface; and Bill Jones, data system.

The transmitted signal is picked up by Argos equipment on NOAA 9 and NOAA 10 and relayed back to Landover, Maryland where it can be retrieve by any computer terminal. The location of the buoy is provided by Serviceargos as are four 8-bit words which are reduced by a simple formula to give sea surface and air temperatures.

In October 1987, a drifter was dropped from the Wallops Sky Van, 100 miles east of Wallops Island and drifted freely in and out of the Gulf stream toward the east. Good data was received until early February, when signals weakened and quit, probably due to battery exhaustion, at a location near

58 degrees west longitude.

Two other Goddard drifters and one made by Metocean were deployed in the Bay of Bengal the last week of March to monitor Bay currents and to provide the Bangladesh Government scientists with temperatures and barometric pressure. This is a feasibility study to prove the capability of small, inexpensive, drifting buoys to send back data to aid in the early detection of monsoon weather.

At the present time, we are working on the design of an optical drifter with three sensors in the 430 to 575 nm spectrum to look at upwelled radiances and three sensors in the 430 to 700 nm spectrum to look at incident irradiance. An on-board computer and a photo cell will be used to turn on the transmitter for 3 hours either side of local noon to take advantage of the higher solar elevation angles. This program will provide validation/calibration of the SeaWiFS space-based ocean color sensor and an optical analog to in-situ sea surface temperature observation. Other benefits include gaining experience with long-term optical drifters and providing a minimal biological/optical time series.

Guidelines for the development and test of optical difting buoys include: air deployable and expendable, reasonable cost for multiple deployment, 1 year lifetime, use of existing technology and a minimal validation parameter set.

The attached drawings show the construction and ocean track of the Atlantic Ocean Drifter and the characterization and typical data of the planned optical drifter.

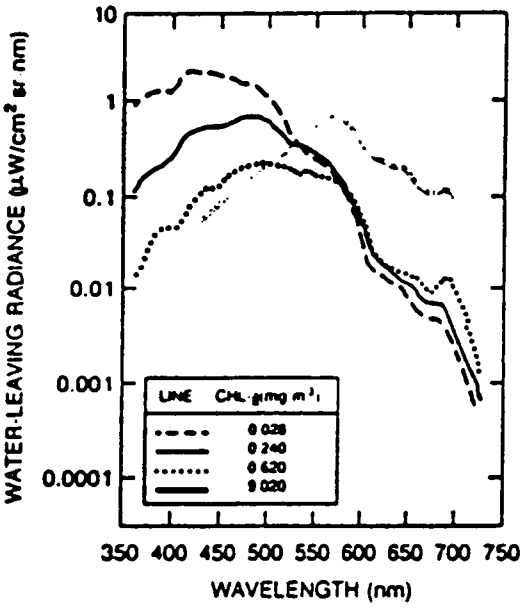

Figure 1a. .Water-Leaving Radiance

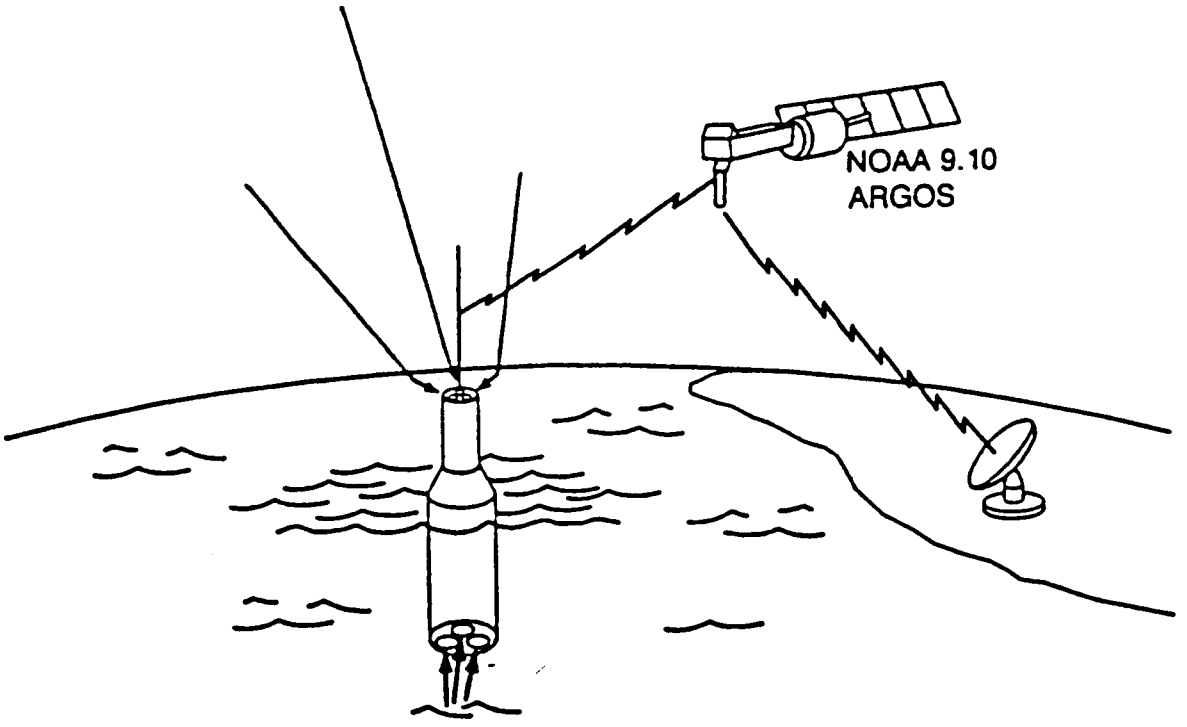

Figure 1b. Optical Drifter

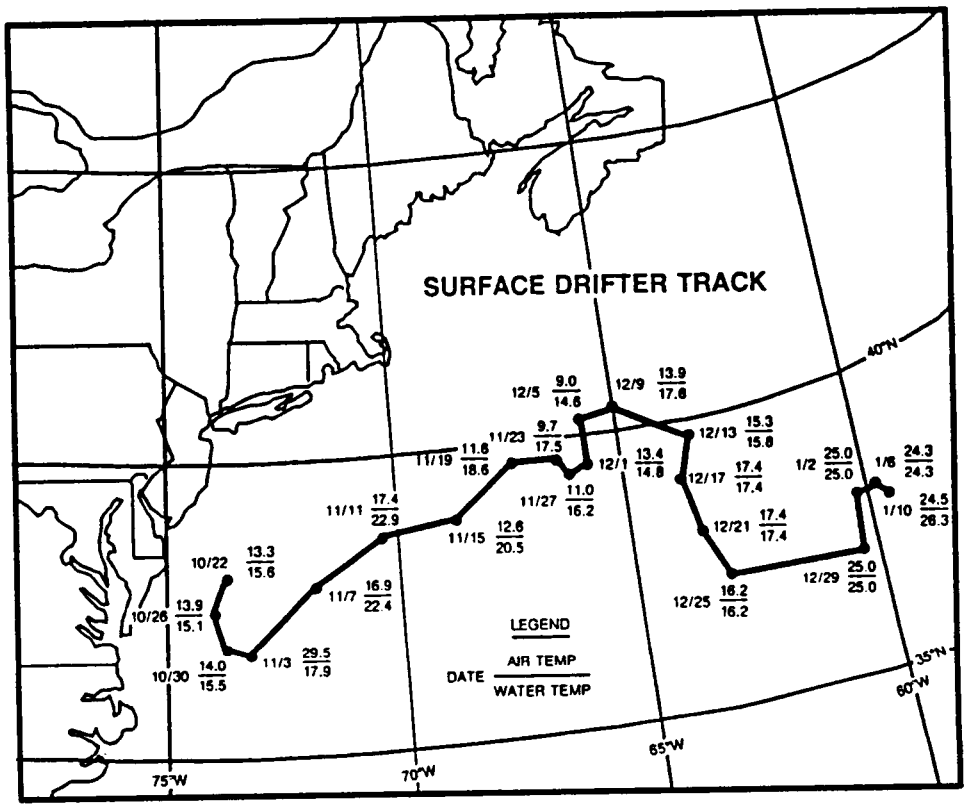

Figure 1c. Surface Drifter Track

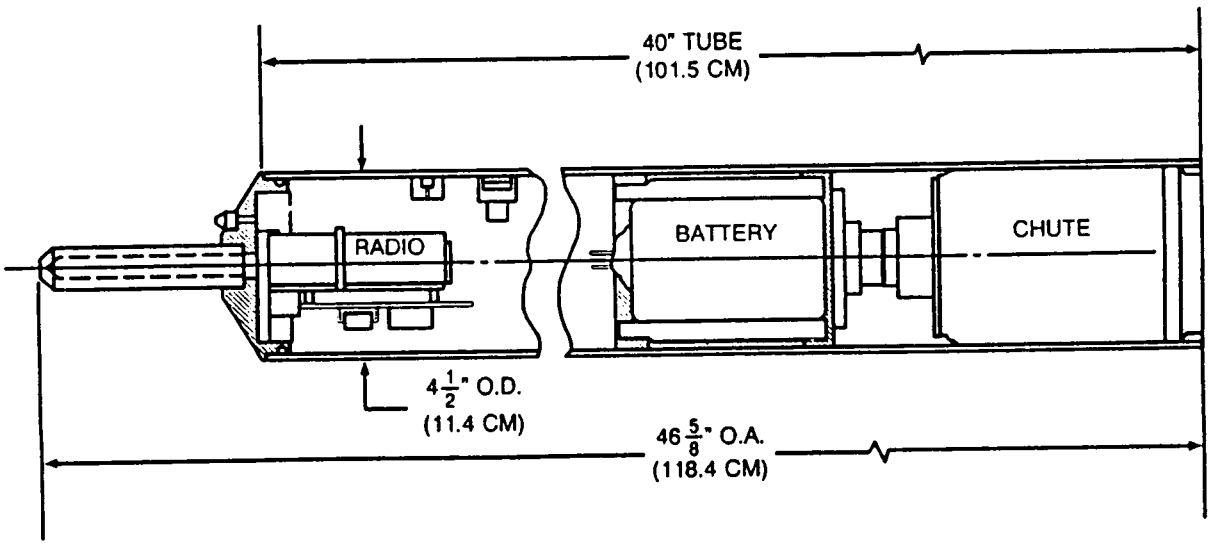

Figure 1d. Air Launched Drifting Buoy