Physical characteristics of the environment influencing pelagic fisheries

0. Funding agency: NOAA

1. Purpose of project:

To deploy a Central Pacific Drifter Array, consisting of one hundred satellite-tracked drifting buoys active for a period of two years each, to map the mesoscale upper ocean flow in the Hawaiian Exclusive Economic Zone. This velocity data was complemented by satellite measurements of surface temperature, surface topography, and wind stress. With these tools, we (i) established a capability for nowcasting the physical properties of the upper ocean over the area (velocity, temperature), (ii) construct a climatology of these properties over a time scale of several years, (iii) study the dynamics and thermodynamics of physical processes acting in the area. These results provided an environmental framework helping the fisheries scientists involved in the JIMAR Tuna and Billfish Research Program to interpret their observations.

2. Progress during FY1998:

- a manuscript to JPO on the theory of vortex merging with application to the eddies off south point discovered with the PRFP drifters, was accepted after revision and appeared in the January 2000 issue (Lumpkin, R., P. Flament, R. Kloosterziel and L. Armi, 2000: Vortex merging in a 1.5-layer fluid on an f-plane. J. Phys.Ocean. v. 30, 233-242).

- a manuscript to Journal of Marine Systems was accepted and will appear sometimes in Fall 2000 (Lumpkin, R. and P. Flament, 2000: Lagrangian Statistics in the central North Pacific. J. Marine Sys., accepted 7 March).

- a manuscript to JPO describing eddies in the lee of the island is nearing completion and will be submitted sometimes in Fall 2000

- a manuscript summarizing our discovery of vortex merging and period quantification has been bouncing first from Nature, then from Science, however with good review, and is about to be resubmitted to Nature.

- a presentation was made at the Liege Colloquium on marine Hydrodynamics by R. Lumpkin

3. Plan for the next fiscal year.

Submit and revise additional papers above (in collaboration with Rick Lumpkin, now a postdoctoral fellow at Florida State University); finish processing of data and merging with satellite data; publish the CD-ROM to be distributed to the community (June Firing).

4. List of papers in refereed journals funded by this project:

see 2. above

5. No technical reports