

JIMAR, PFRP ANNUAL PROGRESS REPORT FY 2004

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Project Proposal Title:

An oceanographic characterization of the longline fishing grounds for albacore, *Thunnus alalunga*, around American Samoa.

Funding Agency: NOAA

Background:

The American Samoa domestic longline fishery has recently undergone extraordinary growth, particularly in the fleet composition of large (>50 ft in length) vessels that have fueled a fivefold increase in fishing effort and landings from 1999 to 2001. Prior to the sudden expansion, most longline fishing around American Samoa were accomplished through a fleet of smaller, 30 ft, open-decked catamarans known as *alia*. To illustrate the expansion, over 50 boats actively participated in the fishery during 2001 deploying 4,690 sets (over 5 million hooks) resulting in catch rates of about 40 fish/1000 hooks. By comparison, only 23 vessels made up the fishery in 1999, making 2,102 sets (ca. 912,742 hooks) yielding 32.38 fish/1000 hooks. Albacore tuna, *Thunnus alalunga* is the target species in the fishery and dominates the catch.

Oceanographically there has been little study regarding the pelagic habitat in the American Samoa region. The current research undertakes the task of characterizing the pelagic habitat and fishing grounds occupied by the American Samoa longline fishery through the use of satellite oceanographic remote sensing and *in situ* shipboard surveys. Coupled with the oceanographic assessment will be fishery information to develop a functional understanding of the spatial and temporal occupation and movement tendencies of large South Pacific albacore and the role of the environment on longline gear performance and catch. These data include albacore depth distribution and gear performance obtained from commercial longlines instrumented with time-depth-temperature recorders (TDRs) and the set level catch information from the American Samoa fishery logbook program.

Progress and problems in FY 2004:

A 15-d oceanographic survey of waters around American Samoa was conducted during March 2004 aboard the NOAA ship *Oscar Elton Sette*. The survey consisted of fifty-one 1,000m deep CTD casts along two meridional tracklines: 169°00'W longitude between 10°15'S and 16°00'S latitudes and 170°30'W longitude between 10°15'S and 16°45'S latitudes. A single transect of twelve 500m deep CTD casts was also conducted across the flanks and summit of the undersea volcano Vailulu'u positioned 45 km east of Ta'u Island at 14°12.9'S 169°03.5'W. In addition to the physical hydrography, information and samples were collected to characterize the standing stock and composition of phytoplankton through the water column. Acoustic backscatter data with split beam echo

sounders were systematically collected to examine zooplankton (micronekton) relative densities. Unfortunately, mechanical failure of the ship's trawl winches precluded planned fishing efforts to "groundtruth" the backscatter data. The ability to acquire in situ currents speed and direction were also lost due to the inoperability of the hull mounted acoustic Doppler current profiler (ADCP).

Just prior to the March survey, sections of longline were instrumented with temperature-depth recorders (TDRs) during a cooperative fishing trip aboard the F/V *Breanna Lynn*. The fishing trip also served as the platform to instrument 6 albacore and 3 bigeye tuna with popup satellite archival tags (PATs) (see PFRP albacore vertical movement project by Polovina and Seki).

Analysis of all datasets continue as we progress through the second year of the study and into FY 2005. While full funding has been received for the two year project, the project time table has been slowed by the logistics associated with conducting the in situ shipboard surveys in the South Pacific. No further funding is being requested.

4. List of papers published in refereed journals during FY 2004.

None

5. Other papers, technical reports, meeting presentations, etc.

Seki, M.P., J. J. Polovina, D. S. Curran, D. R. Hawn, and E. A. Howell (2004). An oceanographic characterization of the longline fishing grounds for albacore, *Thunnus alalunga*, around American Samoa. Presented at Tuna Conference, May 24-26, 2004, Lake Arrowhead, CA.