

**JIMAR, PFRP ANNUAL PROGRESS REPORT
FY 2004**

P.I. Name: John Sibert

Project Proposal Title: Integrative modeling in support of the Pelagic Fisheries Research Program: spatially disaggregated population dynamics models for pelagic fisheries.

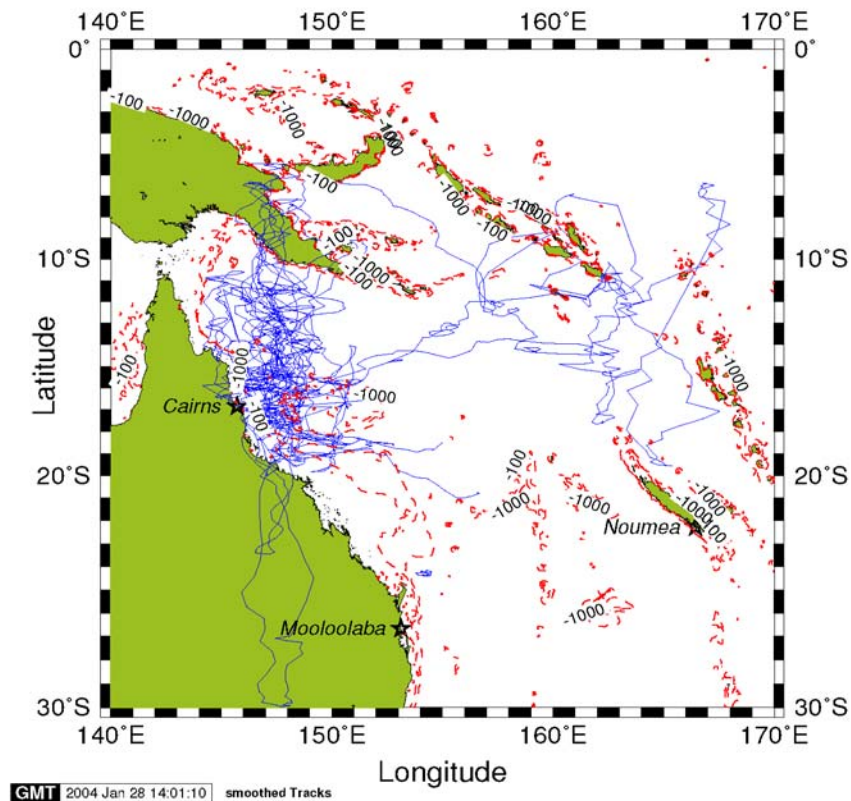
Funding Agency: NOAA

1. Purpose of the project and indicative results.

The general objective of this research is to integrate the results of different components of the Pelagic Fisheries Research Program into a consistent framework that integrates knowledge of fish movement and population dynamics, the fishing process, economics and oceanography. The primary focus is the development of spatial models of pelagic fish population dynamics that explicitly include movement, mortality, and fisheries. The work emphasizes collaboration with other PFRP projects.

2. Progress during FY 2004. Provide a thorough discussion of accomplishments and problems.

Coral Sea Bigeye



Most of the work of the project has been directed to continuing the development and application of the state-space extended Kalman filter model of animal tracks. Last year, a serious autocorrelated latitude bias was recognized in the light-based geolocation algorithms used by several manufacturers of archival tags. A statistical correction for this bias was added to the Kalman filter model. In collaboration with Dr. John Gunn of CSIRO and Dr. John Hampton of the Secretariat of the Pacific Community, this correction was applied to the analysis of fourteen tracks of bigeye tuna tagged with archival tags. The results indicate relatively restricted movements of most of these fish and a tendency to associate with topographic features such as the Queensland Plateau near Cairns, Australia.

In collaboration with Dr. Alan Bolten of the University of Florida, tracks of eighteen Atlantic loggerhead turtles tracked by Argos tags were analyzed using the Kalman filter model. Statistical tests indicated significant differences in the role of long-term directed movements in the behavior of these animals.

Anders Nielsen, a collaborator in the development of the Kalman filter track model, developed a preliminary method to objectively use temperature in estimating position from archival tag data..

3. Plans for the next fiscal year.

Augment the analysis of Coral Sea bigeye tracking data by comparison with sea-surface temperature.

Analyze currently-used light-based geolocation algorithms to identify and correct the source of the autocorrelated latitude bias.

Refine the inclusion of temperature in the Kalman filter model.

Complete analysis of HTTP data using the ADRM.

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

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

6. Names of students graduating with MS or Ph.D. degrees during FY 2004. Include title of thesis or dissertation.

None

7. For multi-year projects, provide budget for the next year on a separate page.