

## JIMAR ANNUAL REPORT FOR FY 2009

P.I./SPONSOR NAME: John Sibert and Kevin Weng

NOAA OFFICE (Of the primary technical contract): NMFS/PIFSC

PROJECT PROPOSAL TITLE: Integrative modeling in support of the Pelagic Fisheries Research Program: spatially disaggregated population dynamics models for pelagic fisherie

FUNDING AGENCY: NOAA

NOAA GOAL (Check those that apply):

- To protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management
- To understand climate variability and change to enhance society's ability to plan and respond
- To serve society's needs for weather and water information
- To support the nation's commerce with information for safe, efficient, and environmentally sound transportation

PURPOSE OF THE PROJECT (One paragraph):

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.

PROGRESS DURING FY 2009 (One-two paragraphs, including a comparison of the actual accomplishments to the objectives established for the period, and the reasons for the slippage if established objectives were not met):

This project continues to have difficulties recruiting a post-doctoral researcher, and little progress was made on the specific goals established in 2008. In addition, the PI (Sibert) for this project retired from the University in December 2008.

PFRP graduate student EunJung Kim has made initial progress in modeling the effects of FADs on movement of tunas. This model uses the advection-diffusion-reaction model previously developed by this project to simulate the effects of FADs by assuming an inverse relationship between tuna diffusivity and the density of FADs. FAD density has a large negative impact on the distance tagged fish move during their time at liberty.

In mid-2008 an opportunity arose to support the on-going development of fisheries models in a fundamental way. The ADModel Builder software became an open source free software enterprise (see [www.admb-project.org](http://www.admb-project.org)). The ADMB software is used in all models developed by the PFRP integrated modeling project (e.g. the diffusion models, Kalman filter track models, HTTP tag exchange and mortality models) and several other important PFRP modeling initiatives (e.g. MULTIFAN\_CL). The PFRP integrated modeling project was able to provide important logistical support for the ADMB project and currently houses the source code repository. The initial phase of this work was supported by project funds. Later phases were supported through a sub-contract from the National Center for Ecological Analysis and Synthesis at the University of California at Santa Barbara.

#### PLANS FOR THE NEXT FISCAL YEAR (One paragraph):

The new PFRP program manager ran a job search for a post-doctoral researcher, and interviewed several candidates with assistance from the previous program manager and PIFSC scientists. A recommendation for a candidate has been made to RCUH, and actions are awaiting the candidate's completion of the PhD degree, and the PFRP plans to hire this candidate toward the end of calendar year 2009.

Continue work on the effects of FADs on movement of tagged tunas using recent data collected by the SPC.

Continue to support the ADMB project.

LIST OF PAPERS PUBLISHED IN REFERRED JOURNALS DURING FY 2009, in the following format: (Author or authors with last name and initials, publication year: Article title. *Journal name*, volume, page range.) For example: Charney, J.G., and A. Eliassen, 1964: On the growth of the hurricane depression. *J. Atmos. Sci.*, 21, 68-75.

#### OTHER PAPERS, TECHNICAL REPORTS, ETC.:

GRADUATES (Names of students graduating with MS or PhD degrees during FY 2009; Titles of their Thesis or Dissertation):

AWARDS (List awards given to JIMAR employees or to the project itself during the period):

PUBLICATION COUNT (Total count of publications for the reporting period and categorized by NOAA lead author and Institute (or subgrantee) lead author and whether it was peer-reviewed or non peer-reviewed (not including presentations):

	JI Lead Author	NOAA Lead Author	Other Lead Author
Peer Reviewed			
Non-Peer Reviewed			

**PERSONNEL:**

For projects that awarded subcontracts in the fiscal year, please provide the number of supported postdocs and students from each subgrantee.

**IMAGES AND CAPTIONS** (We will also be including images for the annual report.

Please send two of your best high-resolution, color images (photo, graphic, schematic) as a **JPEG or TIFF (300 dpi)** with a caption for each image. If you do not have an electronic version of the image, a hardcopy version may be dropped off at the JIMAR office located in the Marine Sciences Building, Room 312):

- Caption 1:
  
- Caption 2: