

## JIMAR ANNUAL REPORT FOR FY 2012

P.I. NAME: Kevin Weng

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

NOAA SPONSOR NAME:

PROJECT PROPOSAL TITLE: Integrative modeling in support of the Pelagic Fisheries: spatially disaggregated population dynamics models for pelagic fisheries (PFRP Modeling Project):

FUNDING AGENCY: NOAA

NOAA GOAL (Check those that apply):

X  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.

# Mission Support

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. The specific objectives were to continue improve and maintain the movemod diffusion and advection modeling software and run the movemod model with new and existing data sets. The PFRP modeling project also collaborates with, and supports the development of the ADMB Project. Recent work includes development of code for the analysis of acoustic array tracking data, which are inherently biased by the nature of fixed receiver arrays.

PROGRESS DURING FY 2012 (One-two paragraphs):

Include a comparison of the actual accomplishments to the objectives established for the period, along with reasons for the slippage if established objectives were not met

A postdoctoral scholar, Martin Pedersen, was brought to the PFRP in 2012. Dr. Pedersen will conduct research into the development of rigorous statistical framework for analysis of acoustic array tracking data. Such datasets typically include data obtained only from locations receivers are placed, introducing spatial bias; include many gaps, introducing temporal bias; and are strongly affected by the original

design of the study. Dr. Pedersen will also work on geolocation of fishes that do not yield good light curves, via alternate sources of environmental information such as tidal, bathymetric, temperature, thermocline.

PFRP graduate student Eun Jung Kim (University of Hawaii, Oceanography Department) continued development of a model to quantitatively capture the effects of fish aggregating devices (FADs) on the movement of skipjack tuna population. This model had been successfully tested in simulation. Additional work by Kim is underway to compute estimates of drifting FAD density in the WCPO using particle tracking software.

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

The PFRP will continue to support ongoing projects, and liaise with the Western Pacific Regional Fishery Management Council and the Western and Central Pacific Fishery Commission. Field research programs in support of fishery management in the Hawaii region will continue. Collaboration with the ADMB community will be extended. Specific work will include the development of a framework for analysis of acoustic array tracking data, the continued development of a system to serve and support geolocation software and algorithms, and the development of systems to serve the processing of geolocation data, allowing users to benefit from these advances without themselves having to be experts in them.

#### LIST OF PAPERS PUBLISHED IN REFERRED JOURNALS DURING FY 2012 OTHER PAPERS, TECHNICAL REPORTS, ETC. PUBLICATION COUNT

#### GRADUATES:

Names of students graduating with MS or PhD degrees during FY 2012; Titles of their Thesis or Dissertation

#### AWARDS:

Name of JIMAR employees or project receiving award during the period, and Name of award

#### PERSONNEL (on Subcontracts):

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

#### ACRONYMS:

SPC (Secretariat of the Pacific Community)

WCPO (Western Central Pacific Ocean)

WCPFC (Western Central Pacific Fishery Commission)