JIMAR ANNUAL REPORT FOR FY 2009

P.I./SPONSOR NAME: Kevin Weng, Jeffrey Polovina and Michael Seki

NOAA OFFICE (Of the primary technical contract): PIFSC

PROJECT PROPOSAL TITLE: Describing the Vertical Habitat of Bigeye and Albacore Tunas and Post Release Survival for Marlins in the Central Pacific Longline Fisheries with Pop-up Archival Transmitting Tags

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): To describe the vertical habitat and horizontal movements of bigeye and albacore tunas and other pelagic fishes in the central Pacific. These tunas are target species in longline fisheries in both Hawaii and American Samoa, and an understanding of the habitats and movements of these species is needed as a background to fisheries management.

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): In 2009 we ended our field tagging work and focused on using or tagging data to build a spatial ecosystem model for the central North Pacific to better understand the movements of swordfish and loggerhead sea turtles. The ecosystem model is being developed as a Ph.D. thesis by Ms. Melanie Abecassis, who is being supported by the project. The ecosystem model uses an ocean circulation model and a food web model to propagate energy through the ecosystem and describes the spatial movement of species at the top of the food web based on changes in their habitat which combines physiological characteristics with available forage. Progress has been made on building a loggerhead sea turtle movement model. Dr. Patrick Lehodey of CLS and the University of Toulouse is a co-advisor on Ms. Abecassis's thesis along with Dr. Jeffrey Polovina.

Secondly, a manuscript that describes the spatial and temporal variation in bigeye tuna habitat has been written and accepted for publication.

PLANS FOR THE NEXT FISCAL YEAR (One paragraph): In FY2010 we will continue to support Ms. Melanie Abecassis's thesis work to build a spatial ecosystem model for the central North Pacific.

LIST OF PAPERS PUBLISHED IN REFERRED JOURNALS DURING FY 2009,
Evan Howell, Donald Hawn, and Jeffrey Polovina. In Press. Spatiotemporal variability in bigeye tuna (Thunnus obesus) dive behavior in the central North Pacific Ocean. *Prog. In Oceanogr*.

OTHER PAPERS, TECHNICAL REPORTS, ETC.:

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

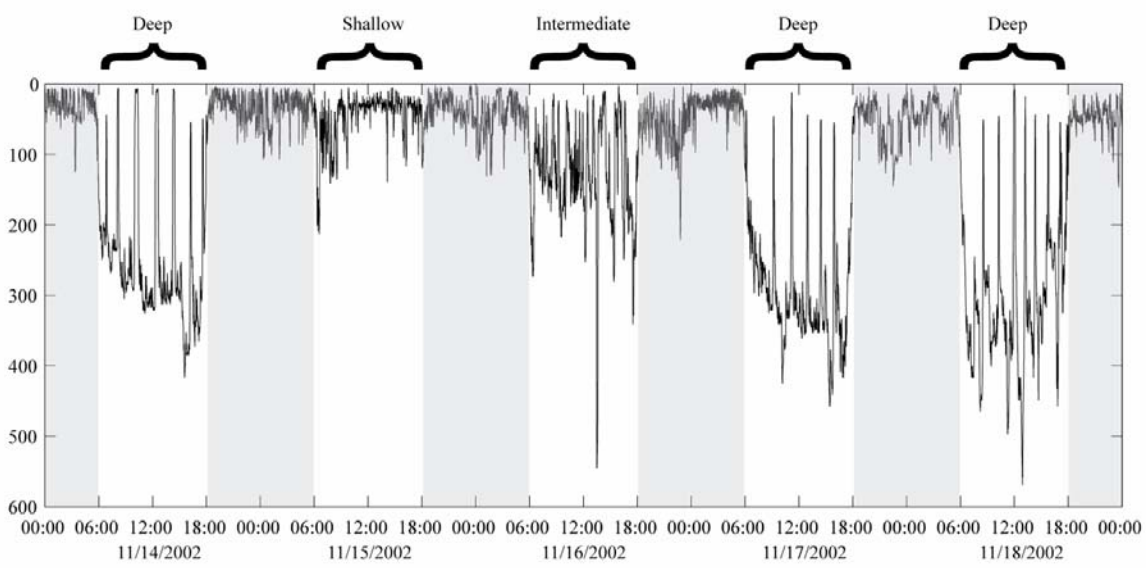
AWARDS (List awards given to JIMAR employees or to the project itself during the period):

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		1	
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: Three types of vertical dive behavior observed in bigeye tuna (Thunnus obesus) from electronic tagging. Shallow dives are less than 100m, intermediate dives target 100-200m, and deep dives exceed 200m. The vertical axis is depth (m) and the horizontal is time and date. White bands are daylight hours, shaded bands are night.