

JIMAR ANNUAL REPORT FOR FY 2011

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NOAA OFFICE (*Of the primary technical contact*): PIFSC

NOAA SPONSOR NAME: Sam Pooley

PROJECT PROPOSAL TITLE: Biotelemetry Tag Retention in Pelagic Tuna

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.
- ☐ Mission Support

PURPOSE OF THE PROJECT (*One paragraph*):

To study the drag, lift, and torsion of pop-off satellite tags (PSATs) in order to increase retention times of the tags in large pelagic fish. The median retention time for PSATs in Bigeye tuna is 9 days, (range: 1-36). PSATs cost upward of several thousand dollars with battery life intended for year deployments. Using force transducers and a tow tank capable of speeds $> 5 \text{ m s}^{-1}$ and accelerations up to 9 m s^{-2} we will determine the forces involved in unseating the anchor head which is typically inserted into the base of the dorsal fin between the pterygiophores. The unseating of the anchor head leads to premature ejection of the tag and possibly to misinterpretation of the data.

PROGRESS DURING FY 2011 (*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

Please see attached preliminary report on two types of PSAT tag (MK10 and X-tag). Seven different tags Microwave telemetry, Wildlife Computers, and Desert Star have been tested to date. We have also tested mock tags of differing shape to look at drag reducing measures. The tags have been tested through speeds of 0.5 m s^{-1} to 8.5 m s^{-1} and

at accelerations ranging from 1.6 to 9 m s⁻². The present data suggest that the burst speed and quick acceleration of pelagic fish may be leading to the early ejection of PSAT tags.

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

In the coming fiscal year we plan to test tags at burst speeds of > 20 m s⁻¹ and accelerations > 15 m s⁻². We will also test tags while attached to tuna casts. The turbulence and boundary layer of the fish body will have an effect on the drag force and movements/rotations of the PSAT tags. In year two we will be able discern tag placement and tether effects to the overall drag and retention of PSAT tags attached to pelagic fish.

**LIST OF PAPERS PUBLISHED IN REFERRED JOURNALS DURING FY 2011
OTHER PAPERS, TECHNICAL REPORTS, ETC.
PUBLICATION COUNT**

**complete excel attachment (JIMAR publications request)*

GRADUATES:

Names of students graduating with MS or PhD degrees during FY 2011; Titles of their Thesis or Dissertation

None

AWARDS:

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

None

PERSONNEL (*on Subcontracts*):

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

Four undergraduate engineering students from the University of British Columbia.

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:

ACRONYMS:

Please provide the complete descriptions for any acronyms used in any areas of the report. For example: UH (University of Hawaii)