# JIMAR ANNUAL REPORT FOR FY 2012

**P.I. NAME**: Dr. T. Todd Jones

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

**NOAA SPONSOR (NOAA TECHNICAL LEAD) NAME** : T. Todd is NOAA/FTE

**PROJECT PROPOSAL TITLE**: Biotelemetry Tag Retention in Pelagic Tuna

**FUNDING AGENCY**: PFRP

**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)*: *Include at least one objective.*

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 > 20 m $s^{-1}$ and accelerations up to 15 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 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.*

In the past year we completed procurements (motor, variable frequency drive, force sensors) and designed a tow tank capable of testing tags at sustained speeds of 20 m $s^{-1}$ and accelerations of 15 m $s^{-2}$ doubling our capability from year one. This research will

continue through April 2013. This PFRP funded research supports four 4th-year capstone project students from the Department of Mechanical Engineering, University of British Columbia. Continuing from this summer we will test all commercially available PSAT tags at 1-20 m $s^{-1}$ and accelerations of 1-15 m $s^{-2}$.

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

In FY13 we will analyze the data from the previous year and prepare a manuscript characterizing PSAT drag versus velocity/acceleration in relation to fish anchor pull strengths. In FY13 we will also be sponsoring four more capstone project students. Future research will also include testing 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.

**LIST OF PAPERS PUBLISHED IN REFERRED JOURNALS DURING FY 2012**
**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 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.*

**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**: