



DESERT STAR SYSTEMS

SeaTag™: Design and Manufacture of a Family of Modular Archival Tags

Marina, CA

Understanding the location, behaviors, and movement of marine mammals can inform and improve fisheries management and species conservation strategies. The advent of electronic animal tags has allowed researchers to track the movement of marine mammals across broader expanses of the ocean and over longer periods of time than previously possible. The tags have increased the understanding of critical habitats, such as spawning areas, for these mammals. The tags also collect information on environmental factors, such as temperature and availability of food sources that impact species' habitats. At nearly \$4,000 each, the cost of pop-up satellite tags on the market was limiting product use. The application of the tag technology was confined to well-funded scientific studies, and even then, only a small population of mammals could be tagged, which led to sporadic data collection. In addition to the expense, tag longevity was also problematic.

Desert Star Systems used funding from NOAA's SBIR program to leverage an existing, unfinished pop-up satellite technology; transforming it into SeaTag™, a suite of four commercially available devices for tracking animals in the marine environment.

Web

<http://desertstar.com/page/electronic-tags>

The NOAA Technology Partnerships Office (TPO) consists of the NOAA Small Business Innovation Research (SBIR) Program and the NOAA Technology Transfer (T2) Program. The SBIR Program provides funding to small businesses that participate in



Photo: NOAA/NMFS/SWFSC

PROJECT

SeaTag™ addresses the limitations of previous products by offering customers low-cost, reusable, and solar based (providing unlimited charge) satellite tags. The full suite of available SeaTags™ have varying sensors, but each is equipped with:

- An accelerometer (measures activity)
- Light sensors (allows for longitudinal locating)
- Magnetic sensor (allows for latitudinal locating)
- Temperature sensor
- Depth sensors

The tag can communicate globally with product users through the use of the Argos satellite constellation. After a programmed amount of time, the sensor detaches from the animal subject and floats to the surface, where it can be collected and reused.

BENEFITS

SeaTag™ data about the location and migratory pathways of the tagged animals can be used to inform where vertical fishing lines are placed; allowing for continued fishing and the increased safety and survival of the mammals including endangered species like the Northern Right Whale. The SeaTag™ project propelled Desert Star Systems into the field of ocean smart sensors; attracting additional investments and increasing company employment and revenues.



Photo: NOAA/NMFS/SEFSC/SFD

The work completed through the SBIR project generated multiple internships and training for new graduates and other young employees. The SBIR award dollars have helped sustain the small company, comprising upward of 20 percent of the company's revenue stream at times. The SBIR award of \$451,000 generated four new jobs and an additional half million dollars in Value-Added (similar to state Gross Domestic Product). Similar economic impact estimates were also derived for SeaTag™ based on product sale and anticipated sale information. The resulting economic outputs generated for the state of California are over \$6.5 million dollars and nearly 30 jobs for actual product sales. Anticipated product sales over the coming year are estimated to yield nearly \$2 million dollars for the state of California and an additional 8 jobs.

NOAA SUPPORT

Desert Star Systems credits the NOAA SBIR Program with providing them the extra support needed to make SeaTag™ technology possible. Desert Star founder, Marco Flagg, spoke to the fact that ocean technology takes a long time to mature, so investors who are willing to wait for financial returns over longer time periods than the private sector, or "angel" investors, are valuable. NOAA is comfortable with receiving benefits or returns over long time periods because they have a continued interest in the impacts and benefits that these types of products generate over time for stakeholders. Today, the SeaTag™ products developed through the SBIR award continue to generate a strong revenue stream for the company while promoting a variety of product uses that benefit a range of diverse stakeholders and wildlife.