

Acoustic telemetry arrays to track fish movements within Prince William Sound, AK

A project of the Prince William Sound Science Center, P.O. Box 705, Cordova, AK 99574—www.pwssc.org

Project Description:

Since 2007 the Prince William Sound Science Center (PWSSC) has used passive acoustic telemetry as a means to track fish movements. To date, the use of acoustic telemetry has allowed fisheries ecologists at PWSSC to monitor residency and seasonal migrations patterns of several commercially important fish species including Pacific herring, Pacific cod, lingcod, and copper rockfish. To track fish movements, coded acoustic transmitters are surgically implanted into target species. These acoustic tags transmit an individual identification code, sensor and time/date information to the underwater receivers which record the telemetry data and transmit stored data to a surface unit on demand.

The use of acoustic telemetry allows us to continuously monitor the presence or absence of tagged fish over the course of several years. This allows PWSSC researchers to discern movement patterns on temporal and spatial scales that are relevant to management while filling in significant gaps in what is currently understood about regional fish stocks. Our arrays will also track fish or marine mammals with compatible tags placed by other researchers. We will then supply any detection information to the scientists who tagged the subject no matter where in the world the tag originated.

Currently, as part of permit #27065 the PWSSC has an underwater array deployed in Port Gravina. In addition, the PWSSC maintains a larger network of receivers located across the major entrances between the Gulf of Alaska and Prince William Sound. The network of receivers at the entrances to Prince William Sound was established in March 2013 (permit #28164) as part of a long-term collaboration with the Ocean Tracking Network.

In 2017 we recovered and had refurbished a series of VR3 acoustic receivers. As part of this permit application, we would deploy the refurbished receivers in various locations throughout PWS to help determine migration routes of tagged herring and pollock.

Details regarding receiver deployment and retrieval

A series of single receivers will be placed in various locations throughout PWS (Figs. 1 and 2). Specifically, single receivers will be placed in submerged waters: a) in Knight Island Passage by Chenega and Mummy Islands (Fig 2A); b) across the upper region of Montague Strait near Marsha Bay, Green Island and Montague Point (Fig. 2B); c) in northern Prince William Sound near Glacier Island (Fig. 2C), and d) near Johnstone Point (Fig. 2D).

Each receiver will be secured to the benthos via subsurface moorings and accompanied by a flotation collar or ball float to minimize tilt (Figs. 3 and 4). Receivers which require yearly refurbishment

Nov 1, 2017

PWS Science Center Contact: W. Scott Pegau, Chief Operating Officer or Mary A. Bishop, Principal Investigator
wspgau@pwssc.org (907) 424-5800 x 222; mbishop@pwssc.org (907) 424-5800 x 228

(VR2AR's) have built-in release mechanisms allowing them to be serviced and downloaded at the surface. The majority of receivers (VR3's) will remain untouched for the duration of the study. Those receivers will be downloaded remotely in the field via a surface modem and transducer. At the conclusion of the study, all receivers will be recovered and removed from marine waters.

Project Coordinates

Note: Each time a receiver is deployed a record of its location and depth is filed with the United States Coast Guard as a *Notice to Mariners*.

Knight Island Passage – 2 receivers; near Chenega Island (60.30201, -148.015681) and Mummy Island (60.30083, -147.92729)

Montague Strait – 3 receivers; near Marsha Bay (60.32913, -147.65212), Green Island (60.30445, -147.42261) and Montague Point (60.37745, -147.13898)

Glacier Island – 1 receiver (60.86305, -147.22289)

near Johnstone Point at Hinchinbrook Island– (60.503523, -146.590480)

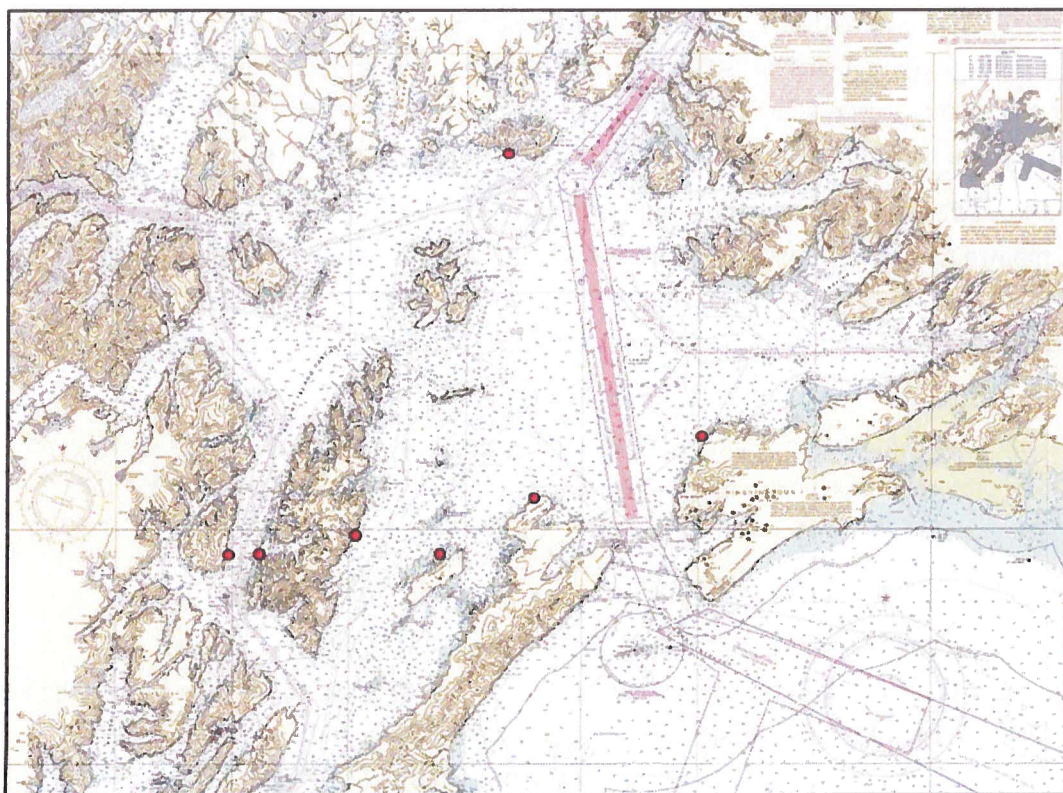


Figure 1. General locations of proposed underwater acoustic receivers (signified by red dots) throughout Prince William Sound, Alaska.

Nov 1, 2017

PWS Science Center Contact: W. Scott Pegau, Chief Operating Officer or Mary A. Bishop, Principal Investigator
wspgau@pwssc.org (907) 424-5800 x 222; mbishop@pwssc.org (907) 424-5800 x 228

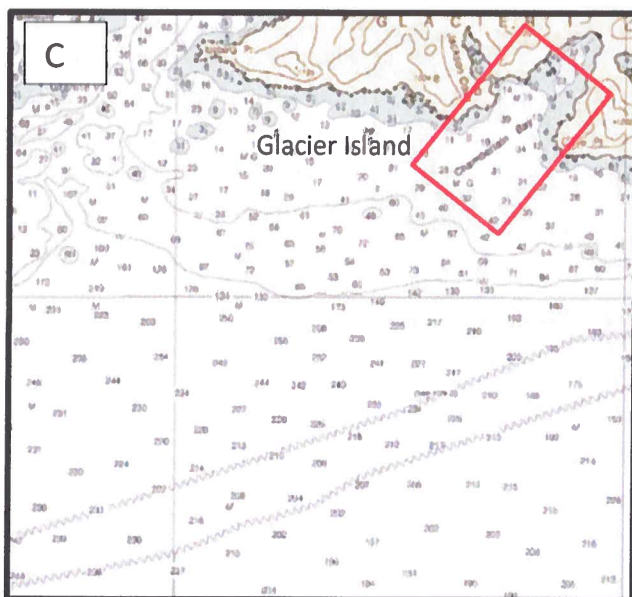
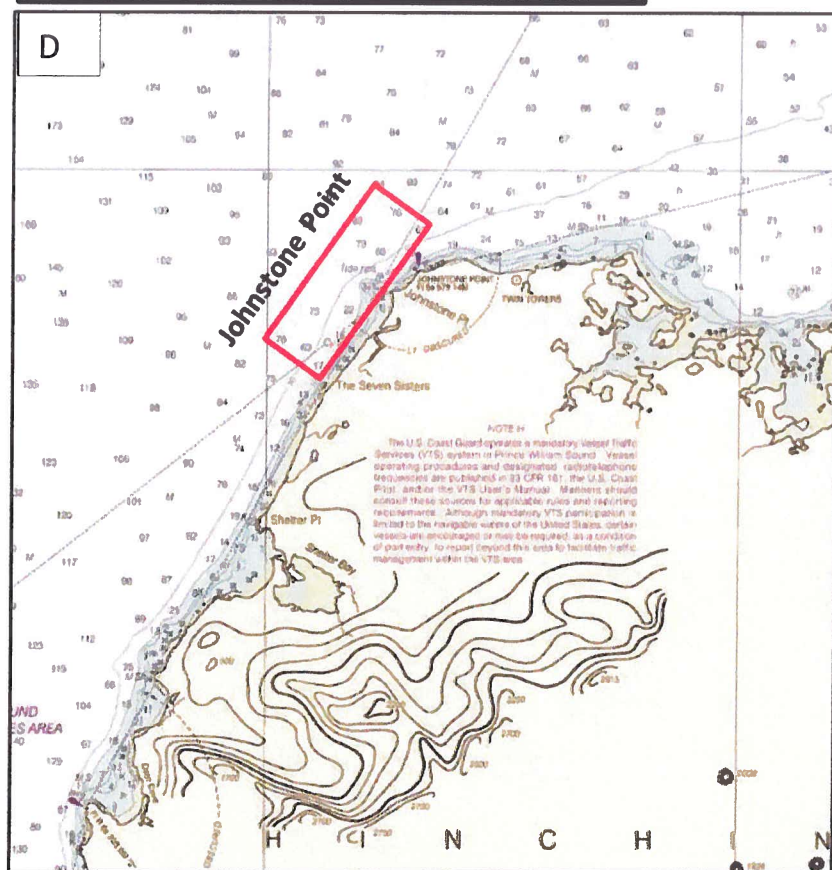


Figure 2C, 2D. Finer-scaled maps displaying approximate underwater receiver locations at: C) Glacier Island (northern Prince William Sound); and, D) near Johnstone Point at Hinchinbrook Island. Red boxes denote the approximate locations where single receivers will be placed.



Nov 1, 2017

PWS Science Center Contact: W. Scott Pegau, Chief Operating Officer or Mary A. Bishop, Principal Investigator
wspgau@pwssc.org (907) 424-5800 x 222; mbishop@pwssc.org (907) 424-5800 x 228

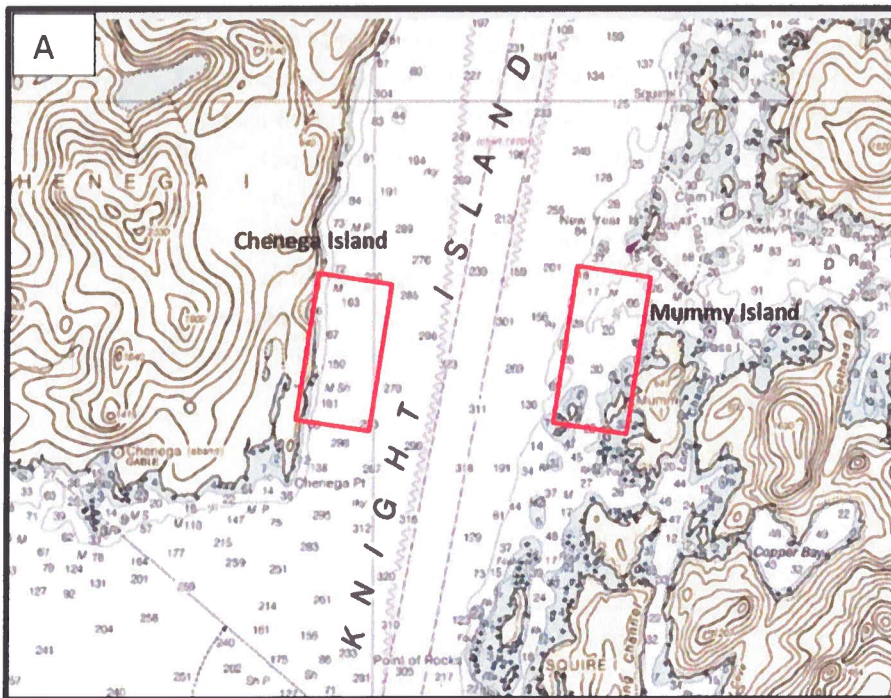
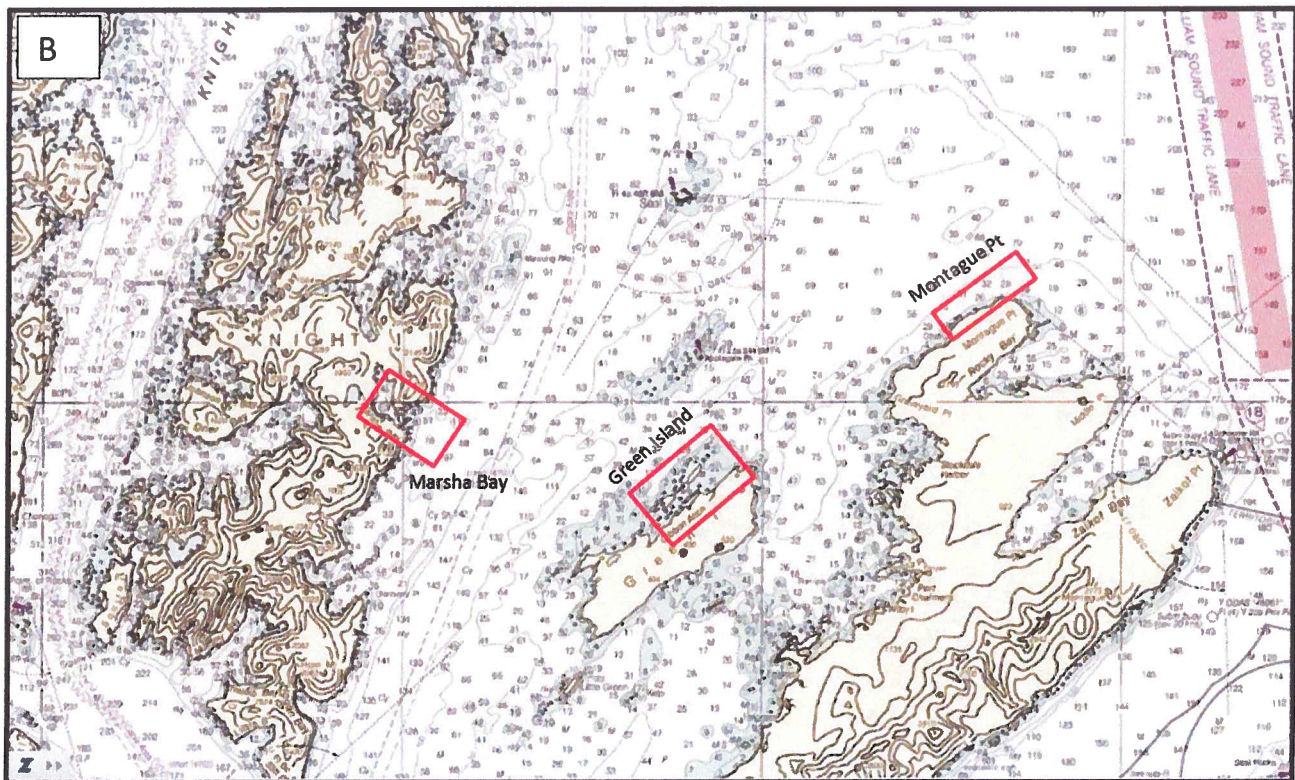


Figure 2A, 2B. Finer-scaled maps displaying approximate underwater receiver locations at: A) Knight Island Passage; and, B) northern Montague Strait. Red boxes denote the approximate locations where single receivers will be placed.



Nov 1, 2017

PWS Science Center Contact: W. Scott Pegau, Chief Operating Officer or Mary A. Bishop, Principal Investigator

wspegau@pwssc.org (907) 424-5800 x 222; mbishop@pwssc.org (907) 424-5800 x 228

Acoustic Receiver Moorings

Receiver type and associated mooring design will vary by location. Receiver stations across Knight Island Passage, northern Montague Strait, and Johnstone Point will consist of a VR3 acoustic receiver with 220 lbs of boom chain as a mooring weight. These receivers are fit with specialized “flotation collars” (Kintama Research) to minimize tilting (Figs. 3A and B). The Glacier Island location will contain a VR2AR receiver which will be moored with approximately 100 lbs of boom chain and a 16” Hardball syntactic foam float (Deepwater Bouyancy) (Fig. 4). Both VR3’s and VR2AR’s will tether to a mooring base with 3/8” Spectra. The VR2AR’s will connect to flotation with 5/16” Spectra. Riser lengths will be at least 16’ or 10% of the mooring depth for moorings that exceed 326’ depth (Fig. 4).

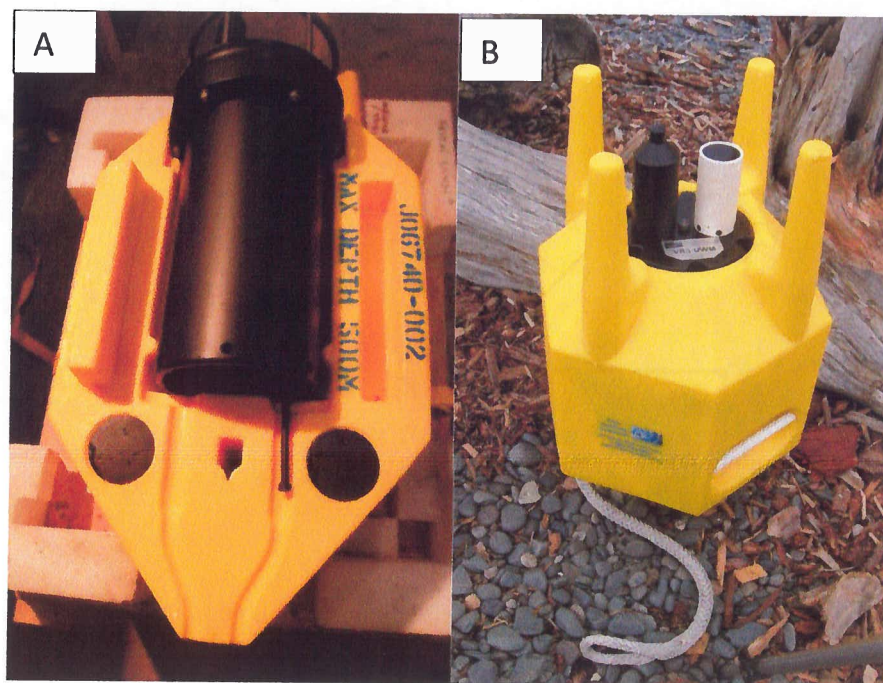


Figure 3. (A) Picture of a VR3 acoustic receiver. (B) Depiction of the receiver and flotation collar.

Nov 1, 2017

PWS Science Center Contact: W. Scott Pegau, Chief Operating Officer or Mary A. Bishop, Principal Investigator
wspegau@pwssc.org (907) 424-5800 x 222; mbishop@pwssc.org (907) 424-5800 x 228

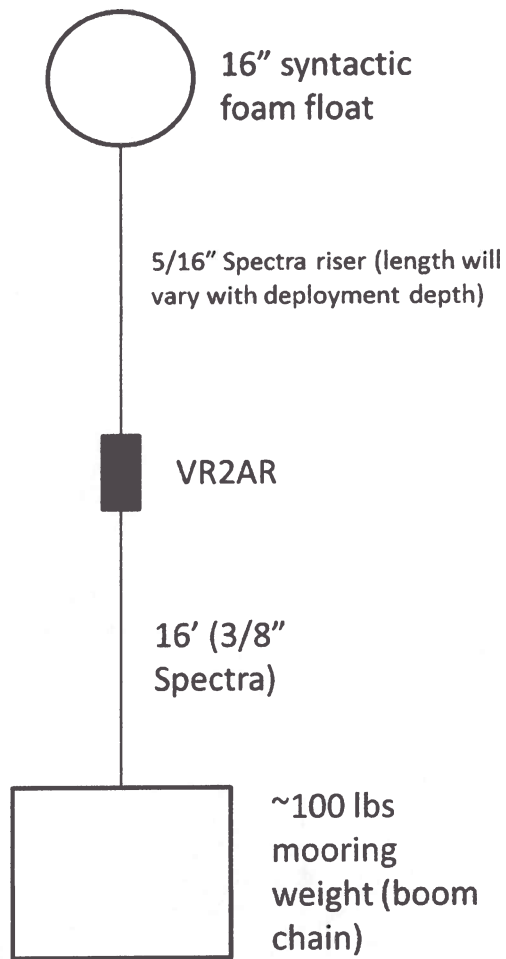


Figure 4. Depiction of a typical VR2AR mooring. VR3 moorings will be similar, however, instead of a riser with a 16" float, the VR3's have a specialized "flotation collar" as seen in Figure 3A and 3B.

Nov 1, 2017

PWS Science Center Contact: W. Scott Pegau, Chief Operating Officer or Mary A. Bishop, Principal Investigator
wspgau@pwssc.org (907) 424-5800 x 222; mbishop@pwssc.org (907) 424-5800 x 228