

Passive Acoustic Telemetry as a Tool for Effective Fishery Management in the Chesapeake Bay Region

Summary of meeting held at the VCU Rice Center on 15 February; meeting included representatives from: USFWS, NOAA HQ, NOAA/NCBO, Department of the Navy, Applied Science Associates/MATOS, Virginia Dept. of Game and Inland Fisheries, University of Maryland, Delaware State University, VIMS, ECU, and VCU

How It Works

In-situ, recording acoustic receivers deployed 24/7 in fixed locations or on mobile AUVs; long-term (up to 10 y) internal (surgically implanted) transmitters (tags) with unique IDs; detection range approximately 1 km, but depends on several factors; establish receiver array with ‘gates’ to capture system ingress/egress; newest generation of receivers (VR2Cs) are real-time

Data Generated□

Georeferenced and time-stamped ‘detections’ of uniquely ID’d transmitters (fish) and—when deployed on or near a CBIBS buoy or AUV—spatially and temporally synoptic data on water quality (e.g. D.O.), temperature, currents, etc. (i.e., habitat). A typical receiver array generates very large datasets

Fishes Currently Being Tracked in the Bay Region

Generally, relatively large, far-ranging (migratory) species, including Atlantic sturgeon, striped bass, sharks, etc., but potentially useful for many species of interest (e.g. blue catfish). Currently, over 900 tagged Atlantic sturgeon, including 110 from the Chesapeake Bay DPS, are at large in Atlantic coastal waters

Current Assets in the Bay Region

The Navy recently deployed up to 70 VR2W receivers in the lower Bay and Capes region (Map 1) but will not deploy many transmitters; the James River Pilot Study (Map 2; funded in part

by NCBO through ASMFC) will deploy approximately 40 acoustic receivers, including 6 real-time VR2Cs on CBIBS buoys and other fixed points, together with an experimental VEMCO Positioning System (VPS) to form one of the largest in-system telemetry array in the mid-Atlantic region. The James River Pilot Study is a collaboration among several federal, state, and academic partners, including NCBO. It will also serve as the pilot project for the MidAtlantic Acoustic Telemetry Observing System (MATOS), a data management system to match tag detections and tag IDs in real-time.

Applications

Provides relatively low-cost, potentially real-time data on temporal and spatial patterns of habitat use, movements, or life history for key species across very broad geographic scales; useful for assessment of critical habitats, triggering or calibrating time-of-year (TOY) restrictions (e.g. for dredging activities), or mitigating effects of bycatch or vessel interactions in near real-time, particularly for migratory species. May be useful for public outreach/engagement (<http://sharks-ocearch.verite.com/>) or surveillance programs for invasive or endangered species. New VPS array can also generate relatively fine-scale (+/- 20 m) distributional data (cp. active tracking)

Current Limitations

Need effective data-sharing agreements among PIs, tools for data management (ACT Network, MATOS), permits for deployment, adoption of VEMCO hardware, operating dollars (boats, gas, personnel) for existing arrays, new tags to replace tags about to go off-line, new equipment to establish new arrays in upper Bay and tributaries

