

Examining EM Data Quality, Integration, and Cost Trade-offs for Alaska's Fixed Gear Fleet

Implementation of electronic monitoring (EM) in Alaska is progressing steadily. EM for the longline fleet was fully implemented in 2018, and EM for the pot cod fleet is being fully implemented in 2019. The pollock trawl fleet is now testing EM, and has applied for an Exempted Fishing Permit that would allow a significant number of vessels to choose EM rather than onboard observers starting in January 2020. The increasing use of EM in Alaska will cause significant changes to the observer program and the data streams used for fisheries management.

This moment in Alaska – with EM for a diverse set of fisheries at stages from initial testing to full implementation – is an ideal time to focus attention on the data these programs generate. This proposal aims to start a collaborative process, involving NMFS and other stakeholders, to address data management, quality, and integration issues in Alaska's fixed gear EM program. The proposed project will focus specifically on:

- selection and definition of required data and metadata elements,
- integration of the EM data with observer data,
- development and documentation of EM data review protocols and sampling strategies,
- processes for quality control of EM data, and
- cost/benefit considerations.

These issues are of critical importance for EM programs because they determine the quality, consistency, and usefulness of EM data, as well as the cost of collecting and managing it. Standardized, thoughtfully designed review protocols are the foundation for building meaningful datasets out of raw EM data. This proposed design process would provide NMFS and industry with the information to assess what elements of the review process cost the most, and make decisions that will optimize the quality and quantity of data collected for the dollars spent.

Comparisons of EM versus observer program costs are often provided in units of cost per day of monitoring or “sea-days,” which are then used to evaluate coverage rates and the necessary budget for each program. However, simple per-day cost does not allow for carefully weighting the differences in the data that can be obtained from EM vs human observers, or fully address the implications for data quality. For example, changes in the precision of bycatch estimates could translate to changes in the buffers applied to annual catch limits.

Additional benefits of a detailed analysis of EM data include cross-validation of data from existing programs to address unintended design bias. There are myriad ways in which EM data collection and review can be structured to optimize the value and utility of the data produced. This is an iterative process, in which optimizing EM data collection and review protocols so that they are cost-effective and achieve program objectives must include integration into existing programs.

This project aims to provide information for NMFS, the Council, and industry stakeholders to support decisions on data collection and review standards that will impact the quality, cost, and integration of EM data from Alaska's fixed gear fleet. It will build on the successful implementation of EM for this fleet, and the data infrastructure already developed including local data review that can produce high quality, timely data. While it will accomplish several specific tasks in the Alaska Region, this study will almost certainly be applicable to the process of EM adoption in other Regions.

Saltwater, Chordata and Sea State teamed to develop open source EM software platform, and all have significant experience with fisheries data capture and management in Alaska. The team's combined capabilities cover the entire range of operations associated with the implementation of a successful EM program. These include: hardware/software development; system installations and skipper training; industry collaboration on fish handling practices and timely tech support to remote AK ports; review protocol design, analysis, and revision; and data analysis, management and integration into existing fishery data streams. The integration of experienced observers, the close collaboration with industry, and the long history of participation in the Council process, gives this team the “big picture” view at the foundation of this project.