

PUBLIC TESTIMONY SIGN-UP SHEET

C-9

Agenda Item: ~~Public Testimony Sign-Up Sheet~~ C-9 EM Workgroup

	NAME (PLEASE PRINT)	TESTIFYING ON BEHALF OF:
1	Nancy Munro HO	NPFA - Saltwater Inc.
2	Don Falleg / Linda Behnken	AZFA
3	Taty Cook	self
4	JOHN JASKOSKI	www.socvt2.org Sails, Oars, Arms, Resuscitation Trust
5	BRENT PAINE	UCB
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

6
6
3
6
6

NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person " to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.



Saltwater Inc.
Electronic Monitoring



IMPLEMENTING EM FOR ALASKA'S POT COD FLEET PROGRESS REPORT

March 28, 2017

Introduction

The North Pacific Fisheries Association (NPFA), a fishermen's organization, and Saltwater Inc., an observer and EM service provider, received funding in 2016 from the National Fish and Wildlife Foundation (NFWF) to implement electronic monitoring (EM) in Alaska's pot cod fishery. The concept behind this project reflects the thinking of many industry participants and builds on two prior NPFA-Saltwater pilot projects to determine the feasibility of EM for the pot cod fishery. With the support of NMFS and the North Pacific Fishery Management Council (NPFMC) the project is part of the "Pre-Implementation" of EM for Alaska's fixed gear fleet. One of the critical goals of Pre-Implementation is to develop sustainable infrastructure that can support long-term implementation of EM in Alaska. This project tests a model that focuses on the importance of high quality data and cost effectiveness. The project highlights skipper engagement, the integration of observers into the EM program, cross training of skilled EM personnel, and a streamlined feedback loop between vessels and the data.

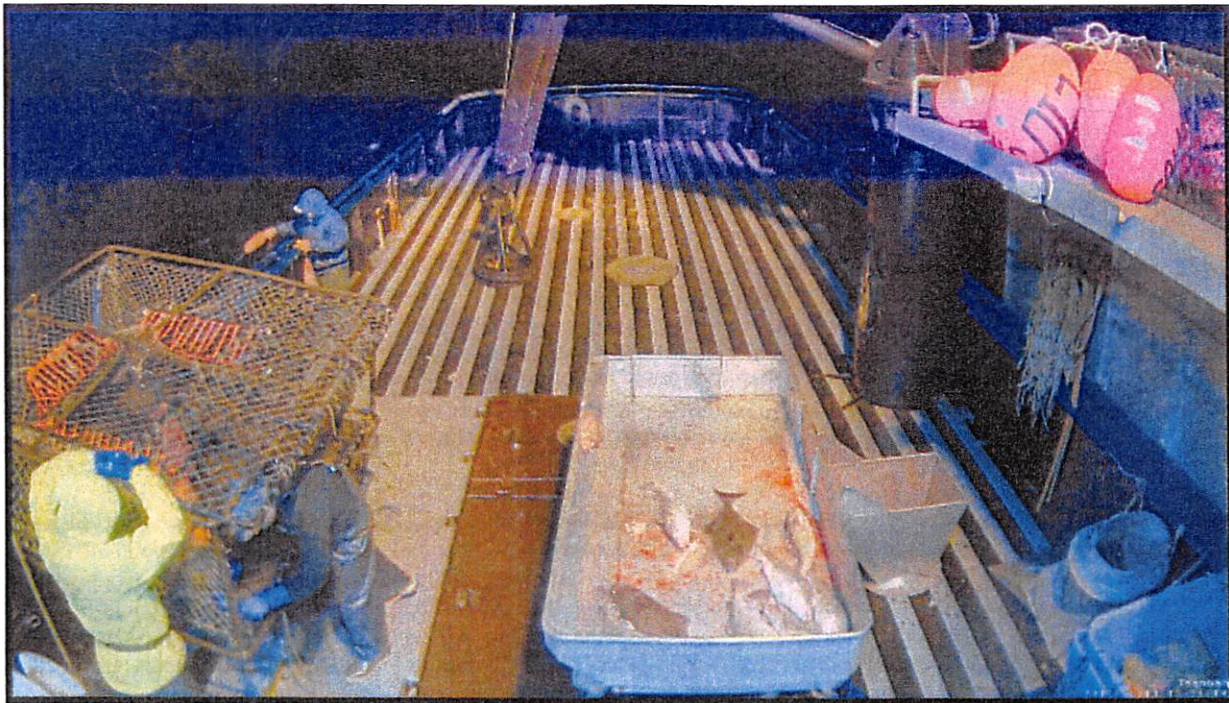


Image 1: Screen shot of EM video imagery of a pot cod vessel deck and sorting table.

Integrating Observers into the EM Program

In multiple EM programs Saltwater has cross-trained NMFS observers to accomplish the different functions necessary for EM program implementation including system installation, maintenance, in-port and remote service calls, as well as data processing and review. This project showcases that model with both former and active NMFS observers working with the EM equipment and the data. NMFS has approved the use of current observers to review data and then return to the field allowing the data review work force to efficiently fluctuate with seasonal needs. With this model the program retains the knowledge of NMFS-trained biologists with hands-on experience in the fishery, observers have increased opportunities, and the program benefits from the efficiencies provided by cross training.

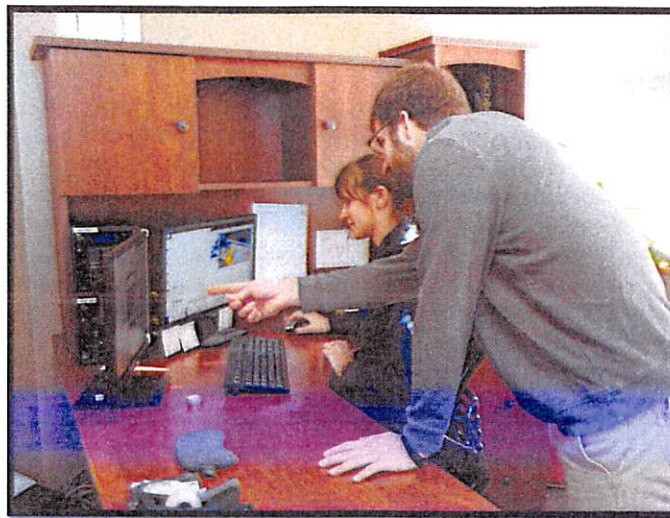


Image 2: Saltwater data reviewers at work.

Installation of Equipment/Skipper Orientation

Alaska's pot cod fishery occurs largely in the 1st and 4th quarters of the calendar year. The plan for this project was to install full EM systems onto the boats and keep them on throughout the year. Prior to the installs Saltwater talked with the skippers or owners of each vessel to let them know what to expect during the install, and to complete a Vessel Assessment. During the installation of the EM systems, Saltwater technicians worked closely with the skippers and crew to explain how the EM system worked, their responsibilities for care, and the required catch handling procedures. Saltwater worked with NMFS and others to establish an approved format for Vessel Monitoring Plans (VMPs) which are prepared for each vessel and detail the data collection goals, catch handling protocols, and operator responsibilities. The VMPs include an operator manual for the EM system, troubleshooting guide, images of the installed camera views, and program contact information. Skippers as well as NMFS and the Pacific States Marine Fisheries Commission (PSMFC) receive copies of the VMPs.

The project was funded in September 2016 and in October 2016, NMFS sent NPFA and Saltwater a list of boats which volunteered to be in the EM pool for pot cod. NPFA and Saltwater staff contacted vessel owners and scheduled installs with 15 boats as specified under the NFWF grant. Installs were grouped for efficiency, and nine of the installs were completed in October/November by Saltwater EM technicians. In November NMFS asked Saltwater to cease installs so they could finalize the number of boats in the EM pool and divide those boats evenly between two EM service providers. NMFS assigned Saltwater 11 of the 21 volunteer vessels, and Saltwater finished the last two installs, skipper trainings and VMPs in December. Nine of the 11 boats are first time users of EM. All of the project's 11 boats were ready for the January 1, 2017 season start.

Remote Field Support and Equipment Maintenance

To minimize the cost of stationing EM personnel in multiple or only selected ports, this project emphasizes direct skipper engagement with the EM systems and data quality, backed up by a strong system of remote tech support and, when needed, in-port service. This is a strategy that Saltwater has used effectively with NMFS' highly migratory species EM program on the U.S. East Coast. That program involves over 100 boats and takes place in 68 ports spread across an enormous geographic area (from Maine to Florida and across the Gulf of Mexico to Texas). To service that fleet, Saltwater developed techniques and materials that allow

for remote trouble-shooting and servicing of our EM systems by willing skippers. Over a two year period 70% of problems in that program have been able to be resolved “remotely” with trained technicians working by phone or email directly with skippers. This project tests that model in Alaska, which also features multiple geographically dispersed ports.

Saltwater’s EM team is stationed in Anchorage, AK, the most cost effective flight hub for nearly all Alaskan ports. Most of the boats involved in this project are fishing out of Kodiak, which is about an hour flight from Anchorage. Critical to any EM program are trained and experienced personnel who can install, service, and develop EM hardware and software. Saltwater’s EM team answers a 24/7 service line, and is readily available for in-port service calls as needed. In addition to answering service calls, members of the EM team: 1) carry out data processing and review 2) prepare feedback memos for skippers, and 3) work on the research and development activities to improve EM. This makes efficient use of their time and shortens the feedback loop between the boats, the data, and tech support.

During the pot cod A season we received a total of 7 calls regarding EM system function. Six issues were resolved remotely either by a simple phone call or mailing the skipper a fix - a reformatted hard drive, a silica packet to address condensation on a camera lens, etc. Only one call required a technician visit to the vessel to diagnose and fix the problem. No fishing time or data was lost.

Data Retrieval

Saltwater’s EM system is designed to allow skippers to easily retrieve and replace the hard drives (HDDs). During the installation of the EM systems, Saltwater technicians provided skippers with instructions and materials which enabled them to mail their encrypted data to Saltwater’s office in Anchorage. Saltwater has staff in Kodiak as part of its observer operations, and they were available to help if a boat needed assistance. Skippers started sending their hard drives to Saltwater’s Anchorage office early in January 2017. Generally, the hard drives arrived in Saltwater’s office for processing 3-4 days (including weekends) after the end of a trip. There were a few outliers, mostly from one boat mailing drives in from Akutan. Hard drives from 25 selected trips were mailed to Saltwater, mailed back to the boats, and mailed to PSMFC. No data was lost or damaged.

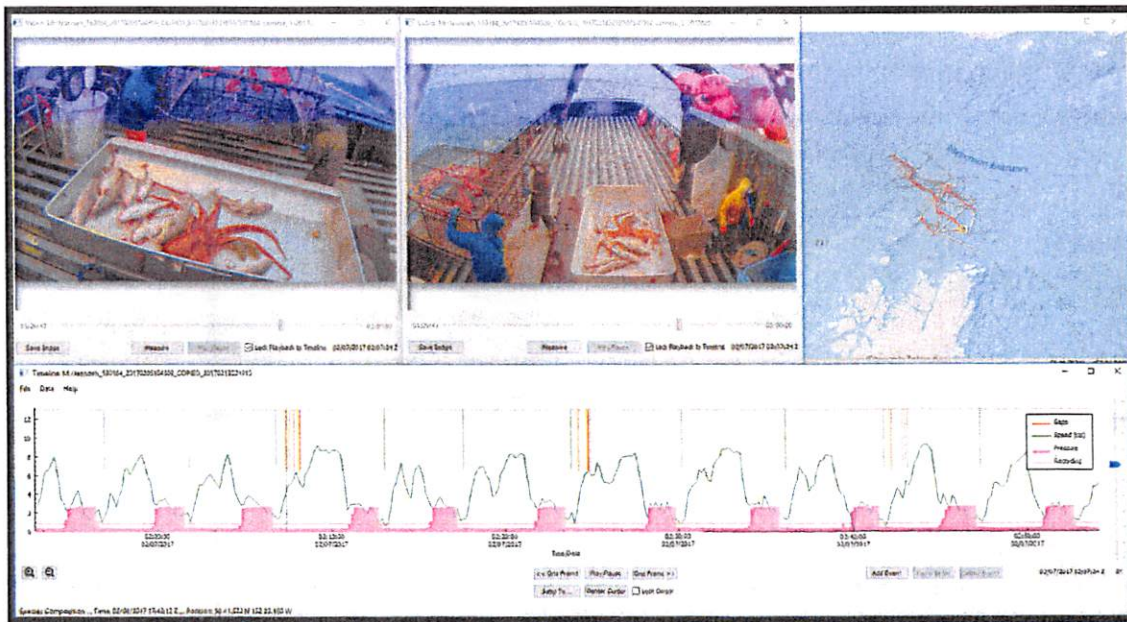


Image 3: Screen shot of data review screen showing two camera views, GPS track, timeline and sensor data.

Data Review

Once the encrypted hard drives were received in Anchorage, Saltwater staff copied them onto a secure server, made a copy and mailed it to PSMFC, scrubbed the HDD, and mailed the original HDD back to the boat. With few exceptions Saltwater began data processing on the day the hard drive was received in the Anchorage office.

In November, Saltwater submitted a draft “Data Design” to NMFS that included a proposed sampling protocol for review of the pot cod data. NMFS approved the protocol, which is based on the sampling protocol used by at sea observers with roughly every third pot selected for review. The pot cod A season opened on January 1 and closed February 23, 2017. During that time the 11 boats in this project fished approximately 360 sea days of which approximately 173 days or 48% were selected for monitoring. Data was collected on approximately 15,000 pot retrievals. Saltwater reviewers recorded counts of catch and bycatch for about 5,000 pot hauls. To put those numbers in perspective, in the 2016 longline program 357 sea days were monitored, and data collected and reviewed from 557 longline retrievals.

Data was reviewed in Anchorage by prior or current NMFS observers who have onboard experience collecting data from active fishing vessels. As a result of this, they come to the EM world already trained in sampling protocols, species identification, data integrity, and a hands-on understanding of fishermen and fisheries. These observers have been cross-trained to review EM data and used the open-source review software that was developed in Alaska by Saltwater, Chordata and Sea State. The software is being used by NMFS and others in multiple EM programs across the country.

Feedback Memos for vessels

Saltwater provided vessels with “feedback memos” that scored them on issues that affect data quality: cleanliness of camera lens, following catch handling protocols, whether catch and gear handling occurred within the camera frame, if a function test was performed before the trip, etc. Each feedback memo included images unique to that trip and vessel, and were emailed to the vessels during the season. This short feedback loop can make an important contribution to data quality by quickly providing insights into what’s working and what’s not, and encouraging active vessel involvement in the program.

Data Integration into NMFS’ Catch Accounting System

In October 2016, Saltwater and Chordata started working with NMFS on issues related to the review and uptake of EM data into NMFS’ databases and ultimately their catch accounting system. The draft “Data Design” Saltwater submitted to NMFS in November suggested data fields and formats to allow integration into NMFS’ observer program databases. Finalization of the data requirements has been a lengthy process with a “final” database schema not completed by NMFS until March. However, the work and agreement on the data fields, review protocols, and “data uptake mechanism” will ensure consistency in the data review process and integration into the NMFS database. Saltwater is using the open source review software to review the data, and it has proven to be readily adaptable to the review protocols and NMFS’ required data fields and formats.

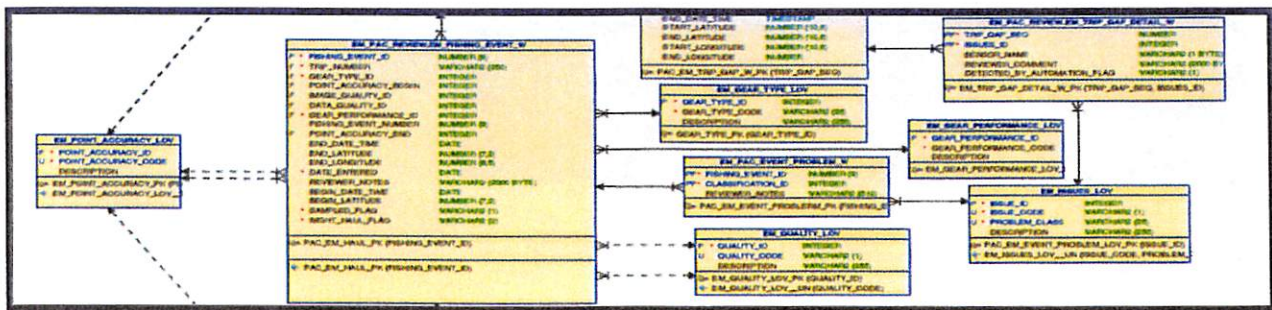


Image 4: Sample of Entity Relationship Diagram (ERT) for AK Pot Cod data

Inclusion of Longline Vessels

In November 2016, the Council’s EM work group recognized that some of the pot boats involved in this project will switch gear and fish longline between the pot cod seasons. This is consistent with our plan to put full EM systems on vessels and leave them on throughout the year. Ten of the 11 boats carrying Saltwater’s EM system will longline in 2017, so we are in the process of making adjustments to the onboard equipment. This includes adding a third rail camera, moving sensors, and ensuring that the deployment of the bird streamer is within camera view.

Research

Two research studies are part of this project, and both are designed to increase the capabilities or lower the cost, of EM.

Validation of the Digital Ruler

Saltwater developed a “digital ruler” as part of a collaborative project with Chordata and Sea State to develop open source EM software. The ruler can be calibrated to measure the pixels in a video image of a fish, and from that calculate a length measurement in centimeters or inches. NPFA-Saltwater tested this tool in a prior pot cod project as a way to collect lengths without requiring onboard equipment beyond the “standard” EM system. Because many of the pot cod boats are relatively small and deck space is at a premium, the objective was to test an approach to length capture that would be minimally intrusive.

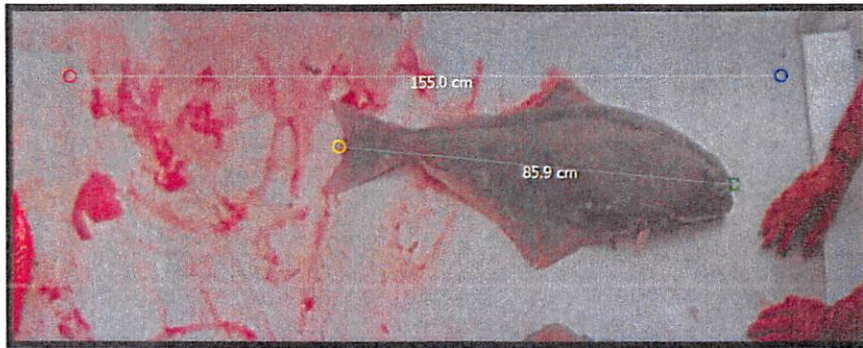


Image 4: Screenshot of digital ruler (with calibration points) measuring halibut.

The initial results were positive, and this year Saltwater is expanding the testing of the digital ruler. In February one of Saltwater’s EM techs, who is also a trained observer, went out on a working pot cod boat to collect physical measurements. He used a NMFS’ measuring board and onboard observer protocols to collect over 1,000 physical measurements of both retained and discarded catch. Later this year those measurements will be compared to digital measurements recorded by reviewers looking at the video images of catch.

Auto-ID of Fishing Events

The identification of fishing events is one of the more time consuming aspects of video review. As part of this project we have developed prototype software that will automate this process using machine learning. This should make the data review process more efficient, and could benefit other fisheries as well as Alaska’s fixed gear fleet.