Electronic Monitoring in the Western Gulf Of Alaska: Pollock Fishery 2020 Year-1 End Results - TEMC

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Background

Beginning in January 2013, vessels in the Western Gulf of Alaska (WGOA) pollock trawl fishery were required to carry human observers on 30% of their fishing trips under the National Marine Fisheries Service's (NMFS) partial coverage monitoring program. This fleet consists of versatile vessels under 60 feet that rotate between gear types, and pollock fishing effort is generally concentrated to a high volume of trips within a short timeframe. Due to the challenges associated with the nature of their fishery, WGOA vessels actively sought out electronic monitoring (EM) as an alternative to carrying onboard observers that would be both cost-effective and improve the quantity and reliability of management data available for their fishery.

Since the pilot program in 2019, WGOA catcher and tender vessels have voluntarily used onboard EM systems to cover 100% of trips and the Exempted Fishing Permit (EFP) for Alaska's pollock trawl fishery officially went into effect in 2020. The fleet intentionally moved to 100% coverage for more accurate salmon bycatch data. The EFP is designed to assess the efficacy of using EM as a compliance monitoring tool for both catcher and tender vessels by comparing data collected from review of EM data, logbook documentation from vessels, and eLandings reports from processors. This report discusses the results from the first full year of the EFP, CY 2020.

Methods

Participating vessels carry EM systems from Saltwater Inc. (SWI). Vessels mail hard drives and logbooks to Saltwater's office located in Anchorage, AK. Data is reviewed according to a protocol approved by NMFS, using SWI's open source software, *O2 Review*. SWI reviewers who are current or prior observers, annotate and review fishing activity in the EM data. This NMFS-approved review protocol was designed to mirror onboard observer data collection efforts while recognizing the different information the cameras and sensors in an EM system can provide. Saltwater continues to work with NMFS and industry to design cost effective review protocols that provide the data needed by fishery managers.

Reviewers annotate data elements during the review process: Trip, Gear Set(s), Gear Retrieval(s), Offload, Discards of Catch, Marine Mammal Interactions, and MARPOL Violations. 100% of gear retrievals and offloads are monitored by reviewers. Compliance is monitored outside of hauls and offloads using a computer vision Human Detector tool.

Participating vessels submit logbook documentation for each trip to the Saltwater office. Logbooks provide trip and discard information and are available to NMFS. Vessels used paper logs in 2019 and 2020, while testing began on eLogs in 2020.

Table 1. Summary of EM participation in the WGOA pollock fishery during 2020.

Summary Information	Installed Vessels	Active Vessels	Trips	Sea Days	Average Trip Length (days)	Hauls	Avg Hauls per Trip	Deliveries to/on Tender
Catcher Vessel	18	14	250	585	2.3	445	1.78	65
Tender	11	11	21	83	4	N/A	N/A	66
Totals	29	25	271	668				

Participation

In 2020, eighteen WGOA catcher vessels and eleven tender vessels had EM systems installed, and sixteen catcher vessels and eleven tender vessels actively fished using their EM System. Two catcher vessels submitted data, but did not have approved VMPs, such that only 14 vessels actively fished under the EFP. A vessel was considered active if it completed at least one trip under the EFP during 2020.

A small quota and a canceled catch share fishery reduced participation during WGOA's A/B seasons in January and March, so only six catcher vessels and one tender vessel participated. The majority of the WGOA's fishing effort under the EFP was concentrated to the late summer and fall C/D seasons.

Saltwater received 126 hard drives in 2020. Catcher vessel's submitted 106 hard drives and the remaining 20 hard drives were from tenders. Of the 126 hard drives received, only 7 of them were received late. Drives are considered late if they are submitted after more than two weeks from the start of the first trip, as required by the EFP. No drives failed or were lost during A/B Seasons, and only a single drive failed during C/D season, although review was still able to be completed on the failed drive prior to the drive being removed from circulation. The hard drives contained a total of 271 trips. Catcher vessels completed 250 trips with a total of 445 hauls. Tenders completed 21 trips and received 66 deliveries (Table 1).

Saltwater completed review and provided feedback forms to vessels for all 271 trips. The feedback forms provided a summary of overall system performance and camera views, crew responsibilities such as system performance checks and mailing the hard drive on time, and a summary of crew operations specific to the EFP.

Of the 271 total trips completed, 264 logbooks were turned in for a 96.4% total submission rate, which was an improvement from 61% in 2019. Catcher vessels had a 97.6% submission rate, while tender vessels submitted 95.2% of logbooks (Table 2). Further discussion of logbook submission and documentation is discussed in Participant Communication.

Table 2. Summary of the availability of logbooks in the WGOA pollock fishery in 2020.

Summary Information	Trips	Logbooks	Logbook Submission Rate	HDDs Received	HDDs Failed	Avg Trips per Drive
Catcher Vessel	250	244	97.60%	106	1	2.36
Tender	21	20	95.24%	20	0	1.05
Totals	271	264	96.42%	126	1	1.70

Tender Vessels

The tendering component of the WGOA fleet makes for a unique aspect of the fishery and requires special attention. For many small catcher vessels, delivering to a large tender located near the fishing grounds is a preferred alternative during the busiest days of the season. Vessels are able to take advantage of excellent fishing conditions to catch more fish before having to make the trip into port, saving both time and fuel costs. Maintaining the ability to utilize tender vessels with the requirements of the EFP is a critical concern of the WGOA fleet.

The data requirements for salmon census specified that tender vessels participating in the EFP can only receive deliveries from EFP catcher vessels within a single trip. They are not allowed to mix EFP catch with non-EFP catch. The group was able to successfully adapt to this requirement through careful communication and coordination.

Other unforeseen complications arose in respect to tenders, including EM systems that were turned off too early, resulting in deliveries and/or offloads that had affected data and could not be fully monitored. There was also confusion between NMFS' definition of an "ODDS trip" and Saltwater's definition of an EM trip. Partway through the season we learned that catcher vessels could deliver multiple trips to a tender under the same ODDS trip number. Some catcher vessels were using new ODDS numbers for every trip, and others were using the same one repeatedly. Tender vessels are merely shuttles and do not utilize the ODDS system. This complicated data collection and efforts to match EM data to eLandings, particularly in respect to tender vessels. Further discussion of the resolution of these issues is discussed in Participant Communication.

Discard Summaries

The pollock fishery is a maximum retention fishery and the EFP maintains this requirement. Some discards can occur and must be classified as either "allowable" or "unallowable". Discards considered allowable include large marine organisms (e.g. sharks larger than 6 ft. and incidentally caught marine mammals), catch kept for personal consumption, large quantities of organisms that could negatively impact catch refrigeration systems and pumps (e.g. jellyfish), net and deck cleaning operations, and discards that occur for safety, weather, or gear malfunction reasons (e.g. net bleeds and panel blowouts). Unallowable discards include the discard of prohibited species such as salmon and halibut, and sharks under 6 ft. in length.

Vessels are required to record all at-sea discards in their logbooks so discard reports can be entered into eLandings by the processing plant. Reviewers annotate both innumerable discards, defined as an estimated discard weight of catch volume (e.g. net bleeds), and quantifiable discards, defined as singulated catch (e.g. one shark). The under 100 pound innumerable discard category was documented most frequently (=145); that is to say vessels discarded small quantities most often. However, by weight, these smaller discards made up only 1.65% of total discards reported. By weight, 80.78% of the innumerable discards occurred within the greater than 10,000 pounds discard category even though they were much less frequent (=8),(Figure 2 and Table 4). Quantifiable discards mainly consisted of catch too large to be pumped from the vessel, catch kept for personal consumption, and other misc. species (flatfish unid., roundfish unid., and invertebrates).

Figure 2. Sizes of EM discards by individual discard event in the WGOA pollock fishery in 2020.

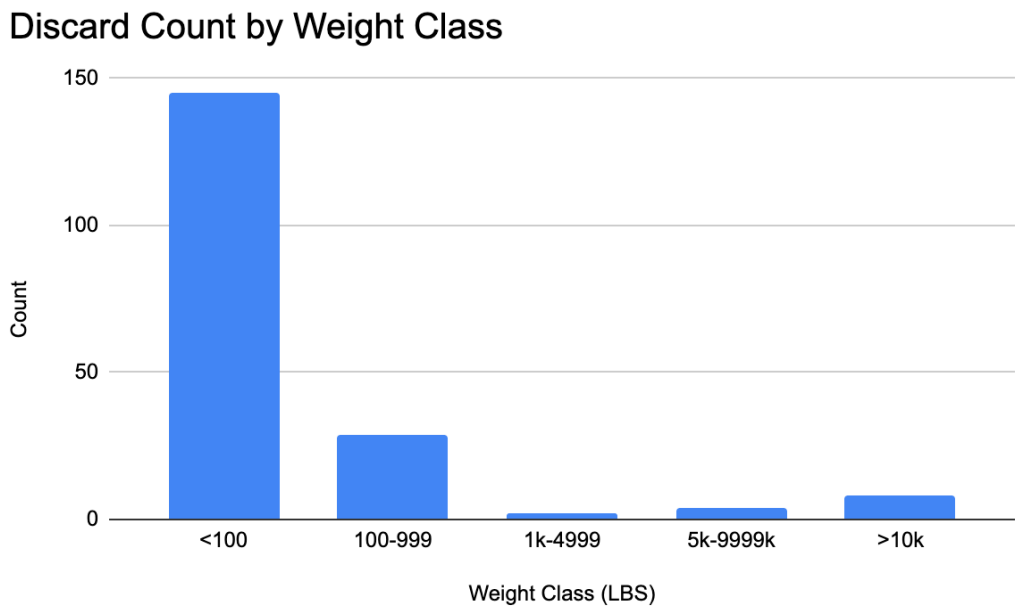


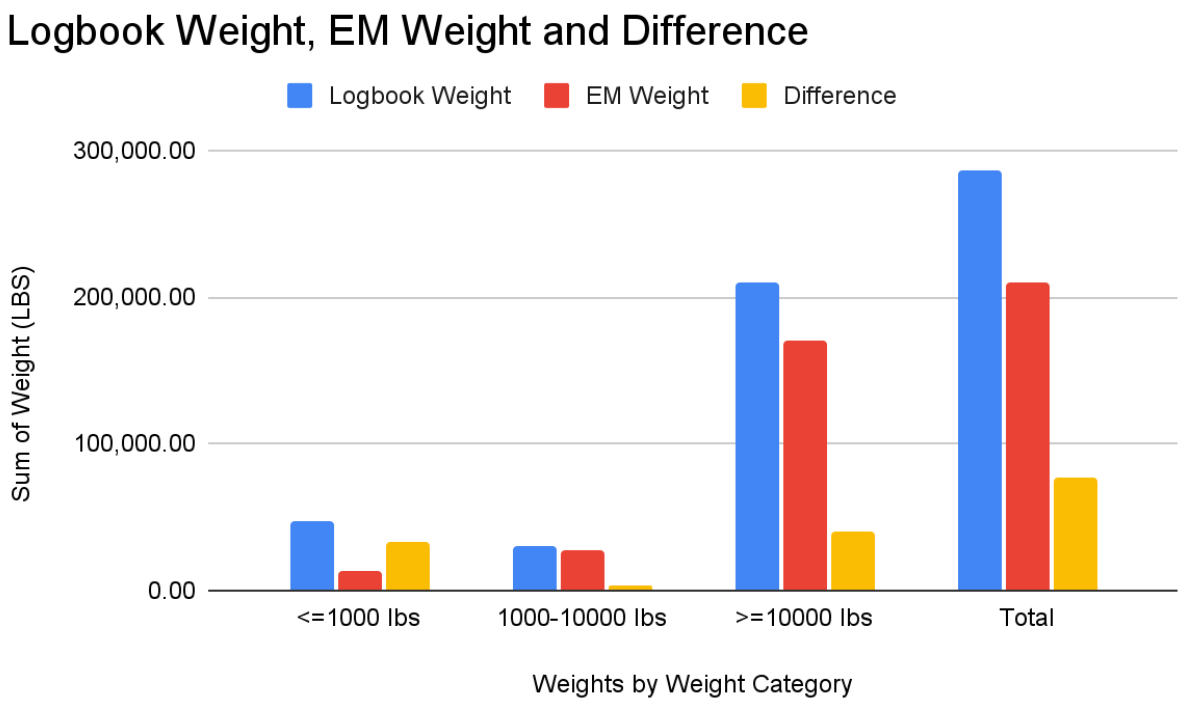
Table 4. Sizes of EM discards by individual discard event in the WGOA pollock fishery in 2020.

Weight Class (LBS)	<100	100-999	1k-4999	5k-9999k	>10k	Total
Count	145	29	2	4	8	**188**
Weight (LBS)	3,482	9,758	4,172	23,043	170,023	**210,478**
Percentage	1.65%	4.64%	1.98%	10.95%	80.78%	**100.00%**

Reviewers noted that discards occurred both during and outside of gear retrievals. Most discards (63.75%) occurred during gear retrievals with the remaining 36.25% occurring outside of retrievals. Onboard observers would likely not be on deck to see and report discards between gear retrievals.

In comparing EM reviewer data with logbook reported discards, vessel logbooks overall reported a higher discard volume than EM reviewers. Vessels reported 286,915.5 pounds and EM reviewers estimated 210,478 pounds discarded across all trips (Figure 3). Variations in EM data and logbook discard information reflect that while both EM reviewers and vessels are providing estimates, reviewers and vessel operators each have their own limitations on what discards can be seen (e.g. vessel operators and/or reviewers may have a more difficult time observing smaller discards, a captain may not see a crew member discarding a salmon, or reviewers could miss a discard based on available data), and discard estimates are affected by the review protocol in place. For example, changing protocols can alter the amount of video watched, the types of discards marked and/or how discards are marked.

Figure 3. Logbook and EM discard comparisons in the WGOA pollock fishery in 2020.



Marine Mammals, Sharks, Salmon, and Birds

Only one take of a marine mammal occurred in 2020 when a Steller sea lion was caught in the trawl net and the vessel accurately reported it in their logbook. This information was captured in the EM data via an annotated Marine Mammal Interaction while awaiting clarification from NMFS on whether to also mark the take as a discard. EM reviewers also reported other marine mammal interactions which largely consisted of vessels attempting to deter sea lions away from their vessels. One bird was observed to be discarded during net cleaning activities. The reviewer was unable to verify the species due to the condition, but commented that it may have been a Shearwater. The discarded bird was not reported on the logbook, but the crew member did present the bird to the camera prior to discarding. Table 5 presents shark discards observed in EM review (trips and offloads) and sharks reported on logbooks in the WGOA pollock fishery in 2020.

Species	EM Review	Logbook
Blue Shark	1	0
Pacific Sleeper Shark	15	11
Salmon Shark	258	81
Spiny Dogfish Shark	15	9
Unidentified Shark	0	48
Grand Total	**289**	**149**

Table 5. Sharks observed in EM review and discarded sharks reported on logbooks.

EM reported 245 sharks discarded within the trip, excluding offloads, while vessel logbooks reported only 149 discarded. The processors did not report 44 sharks discarded while at the dock. The vessels are not required to document sharks discarded at the dock; this requirement belongs to the processors who document them in eLandings. Vessels documented 60.1% of sharks that were found during review. One factor that likely contributed to 100% of sharks not being reported by vessels and processors was confusion in the discard reporting responsibilities depending on the circumstances of when a shark was discarded. Reporting responsibilities vary depending on if the shark was discarded at sea, pulled out during the offload at a shoreside processor, or pulled out during the offload at a tender vessel. We worked with NMFS and EFP participants throughout 2020 to clarify the reporting requirements for the various discard scenarios to help improve future reporting.

EM reviewers reported the discard of 15 spiny dogfish sharks during 2020 and communicated to the vessels that sharks smaller than 6ft are required to be retained. The maximum length of a spiny dogfish shark is approximately 4.5 feet, so when this species is identified as a discard it is always out of compliance.

During A, B, and C seasons vessels were estimating the weight of large discarded sharks. Prior to D season, NMFS requested the implementation of length/weight tables for Pacific Sleeper Sharks and Salmon Sharks in order to obtain more accurate weight data. These species are the primary large shark discards in the pollock fishery and when using the correct species table, weights for a given length are widely accepted as consistent enough for use in fisheries management. At-sea observers have been using these tables for shark weight data for decades. A simple identification sheet and instruction packet were provided to vessels, along with measuring tapes. The fleet willingly took on this additional task and were seen in the EM video accurately measuring sharks. Some vessels recorded only the length instead of the translated weight on their logbooks, but this information was still able to be used by Saltwater and processors to obtain a weight. Implementation of eLog in 2021, which automatically translates a length into weight for both shark species, will solve this issue.

EM reviewers did note the discard of only eight salmon. In one instance the catcher vessel captain had initially reported the discard on his logbook. In communication with the vessel, we learned that the captain had observed a new crew member discarding the salmon. The captain immediately clarified with the crew member that discarding salmon is prohibited, and then the captain self-reported to Saltwater

via the logbook and a phone call. In the second instance, a tender vessel was sorting catch off of a belt and into totes. The vessel's fleet manager and EFP principal investigators were contacted for compliance with the EFP to prevent further issues.

Offload Review

In addition to reviewing trip video footage, SWI reviewed offloads of participating vessels to ensure compliance with salmon retention requirements according to the NMFS-approved review protocols. In addition to the catch stored in tanks, offload review also included monitoring the pumping of deckloads for 48% of all catcher vessel offloads. Discards for large species and personal retention of some species are allowed; however, large organisms like sharks are utilized in ecosystem management and need to be documented by the processor. Saltwater's comparisons of review data to eLandings data suggests there are still discrepancies in required reporting of these shark discards.

During offloads, reviewers identified 181 individual species with no weight, and 45 innumerable discard events that amounted to an estimated 6,394 pounds of fish discarded at the dock during offloads. 2020 Review Data shows an improvement in offload catch handling as no salmon were discarded and only minimal discarding of species that were not part of the "large discard" exemption. Some additional species like skates, which are difficult to get through the processing pump, are also discarded at the dock. The fleet has requested that this species be investigated and added to the exemption list.

In 2020, 19.2% of total review time was spent monitoring offloads and the remaining 80.8% of time spent completing review was concentrated to the trip level . Saltwater reviewers observed regular processor and/or vessel crew interaction with the catch during offloads, as well as marine mammal interactions.

eLandings Comparisons

Each season, eLandings data was reviewed and compared with EM data and vessel logbooks. Issues were found in reporting by both vessels and processors including landed discards not being reported in eLandings, submitted logbooks not being entered into eLandings, vessels not providing complete information needed for eLandings reporting (e.g.,vessels may have been missing a weight or species), vessels failing to initially submit their logbook to the processors, and delivered salmon coded as being discarded at sea.

During C Season Saltwater discovered that while vessels were submitting copies of logbooks to us, a significant number of boats were not submitting copies of logbooks to the processors at offload. This prevented discard information from initially being entered into eLandings. The PI and the Fleet Representative actively worked to round up logbooks and get them submitted to the processor. This issue may have affected the accuracy of eLandings data since delivery information would have been entered before the processors received discard information from logbooks. Many vessels were using logbooks and participating in the EFP for the first time in C Season, so some issues were anticipated. Through active communication problems were quickly resolved.

It is important to note that while vessels were sometimes responsible for failing to report discards in their logbooks, there were occurrences when discards were accurately reported by the vessel, but were not entered by the processor into eLandings. Two particularly noteworthy instances occurred in D Season 2020, when vessels properly recorded significant amounts of pollock (5,000 lbs and 10,000 lbs) as discarded at sea due to a gear malfunction and safety reasons respectively, but neither were reported by the processor in eLandings.

In addition to resolving particular discrepancies, Saltwater and the PI are continuing education and outreach efforts to ensure all participants recognize and understand their responsibilities in the program. We continue to work with NMFS to get additional information and guidelines for reporting and correcting the data.

2021 WGOA Update

In the 2021 A season, a total of 4 trips were completed by 2 vessels for the WGOA fleet. The four trips consisted of 11 hauls. No tenders participated in the A season. Due to the small amount of data available for the A season, we will provide a more detailed analysis of the 4 trips included with the B season reporting.

During the A season, we did additional testing of our electronic logbook and data portal. The electronic logbook simplifies data entry for vessels by automatically suggesting haul data, populating geospatial information, and helping prevent erroneous entry. The data gets uploaded to the AEB Data Portal, is checked for potential issues, and discard information is sent to the processors for eLandings. Once a fish ticket is generated, the eLandings data is used to provide participating fishermen with salmon hotspot information. The data portal is able to receive eLandings, eLog, and EM pertinent data. Using the three sources of information helps validate all of the information and helps generate quick responses to any issues with the data submitted. Having this information for B-Season should help keep all stakeholders apprised and continue to facilitate good feedback.

Conclusions and Comments

In 2020, we saw increased catcher and tender vessel participation, improvements in logbook submission, and a significant increase in compliance with salmon retention. Vessels consistently demonstrated an investment in their fishery by responding to Feedback Forms, making visible improvements in catch handling, and actively participating in data collection for more accurate shark weights.

There are significant hurdles remaining that require continued cooperation and communication to overcome. Many of these challenges are the result of the particular nuances of the WGOA pollock fishery that created a steep initial learning curve for all involved in this first full year of the EFP . The two core issues are: 1.) accurate documentation and communication by both vessel operators and processors, and 2.) finding effective, consistent resolutions to assess and resolve discrepancies between EM data, logbooks, and eLandings data. We anticipate the continued implementation of the elog will eliminate documentation hurdles between the fishing vessels and the processors. The implementation of the electronic logbook will allow for the immediate communication of discard information to the

processor and Saltwater. This should enable a faster response time to any issues related to documentation between the vessels, the logbooks, and eLandings. This work, done in conjunction with the WGOA Data Portal, will increase data timeliness to help reduce salmon bycatch by relaying potential salmon hotspots.

It should also be noted that although unquantifiable, COVID-19 quarantine restrictions minimized vessel and processor contact, and restricted access to processing plant offices which likely hampered communications this year. There are moving pieces in the EFP, but with the vested interest and engagement of the fleet, principal investigators, Saltwater, and NMFS there will be continued improvement of both the quantity and quality of fisheries management data available to the WGOA fishery via electronic monitoring.