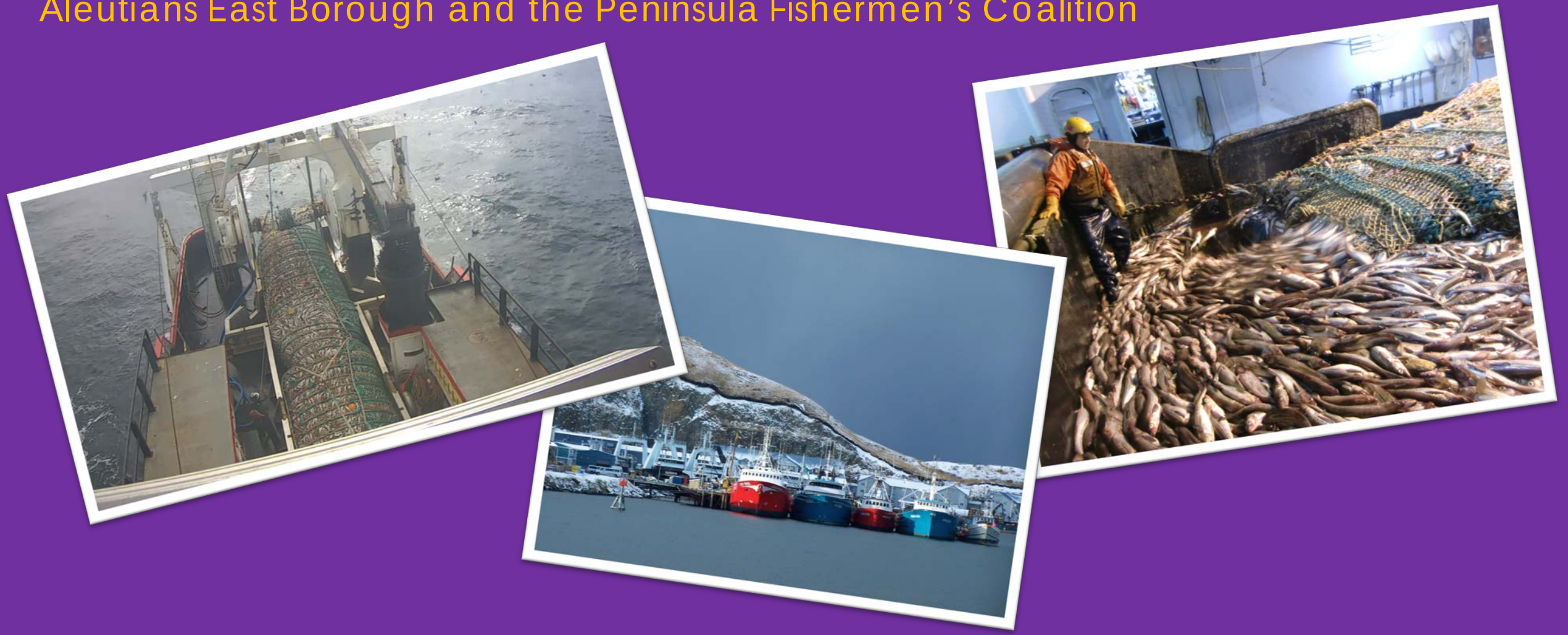
IMPLEMENTING ELECTRONIC MONITORING IN THE BS AND GOA PELAGIC POLLOCK CATCHER VESSEL FISHERIES:

An EFP application from United Catcher Boats, Alaska Groundfish Data Bank, Aleutians East Borough and the Peninsula Fishermen's Coalition



PRESENTATION OUTLINE

- Part I: Introduction
  - Purpose, Goals, Objectives
  - 2019 Pilot Testing
- Part II: EFP Scope and Technical Details
  - BS and GOA Shoreside and Tender Vessel Components
- Part III: EFP Operations
  - BS and GOA Shoreside and Tender Vessel Components
- Part IV: Expected Outcomes and Metrics of Success

Council Goals and Objectives for EM in the Pelagic Pollock Fisheries

- Objective 1: Improve salmon accounting
- Objective 2: Reduce monitoring costs
- Objective 3: Improve overall monitoring data for catch accounting and compliance
- Objective 4: Examine current regulatory retention and discard requirements as necessary to achieve Objectives 1-3

BS VS. GOA

Bering Sea	Gulf of Alaska
MRA/IRIU	
No trip limits	300,000 lb trip limit (CV); 600,000 lb (tender)
Coop - catch share/managed on individual-vessel basis	Limited access, derby-style/managed area-wide
100% observer coverage	Partial observer coverage (20-28%)
Paid for directly by participants (pay-as-you-go)	Paid for by 1.25% industry fee (ODDS)
100% shoreside delivery	Mixed shoreside and tender delivery • Area 610: Primarily tender, some shoreside • Areas 620/630: Primarily shoreside, some tender
CMCP, dedicated shoreside observer, vessel observers	Random trip selection, vessel observers only
Salmon PSC Rate: full salmon census data	Salmon PSC rate: Determined according to strata • Observed trips delivering shoreside > observer moves into plant for salmon census > rate applied to unobserved portion of shoreside fleet. • Observed trips delivering to tender > observer collects at-sea sample of PSC > rate extrapolated to entire catch > rate applied to unobserved portion of tender sector.

Purpose of EFP

- To assess the efficacy of EM to monitor compliance with full salmon PSC retention in the BS and GOA pelagic pollock catcher vessel fisheries delivering to shoreside processors and tender vessels.
  - It is anticipated that EM will provide more stable salmon accounting against the WGOA and CGOA salmon PSC hard caps as well as the salmon PSC performance standard for BS pelagic pollock catcher vessels.

SHORT-TERM GOALS

- To explore innovative methods to account for non-salmon PSC and groundfish bycatch species, as well as innovative methods to account for protected species.
- To achieve more comprehensive monitoring coverage in the GOA pollock trawl fisheries delivering to both shoreside plants and tender vessels.

LONG-TERM GOAL

- To identify key decisions related to operationalizing EM and the development of a regulated EM program for compliance monitoring
  - Given existing IRIU and MRA regulations, the viability of a full/maximized retention pollock fishery coupled with a dedicated shoreside monitoring component will be assessed as a potential future fishery management option.

EFP OBJECTIVES

- Objective 1: Demonstrate that maximized retention can be achieved in pollock trawl catcher vessel fisheries.
- Objective 2: Demonstrate that at-sea observers can be replaced with observers at shoreside processing plants such that data needs and data streams for effective fisheries management are maintained.
- Objective 3: Demonstrate that EM camera systems can adequately capture discard events (when they occur) and that video data can be used to verify vessel logbook discard information for compliance monitoring purposes.

EFP OBJECTIVES (CONT'D)

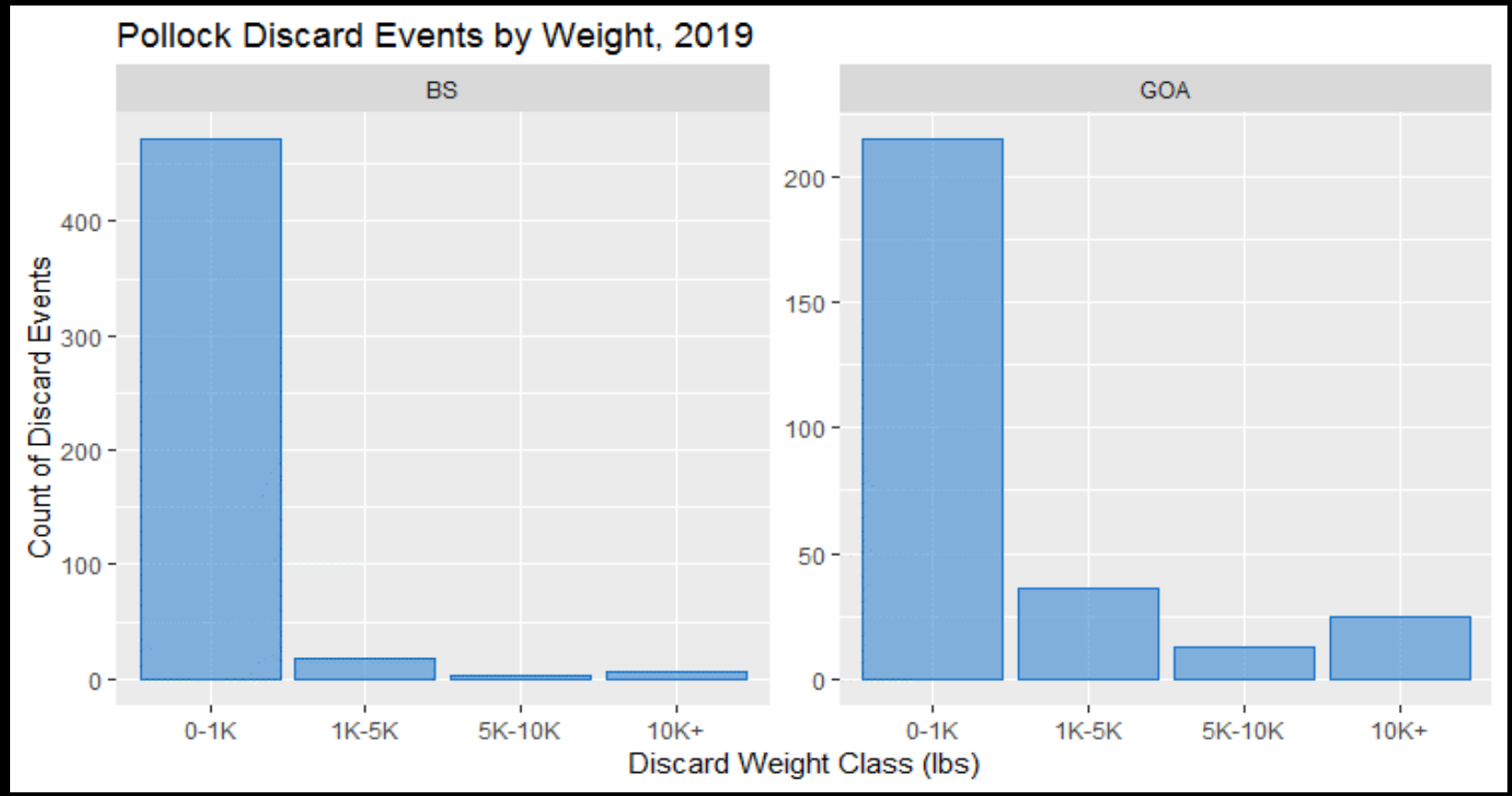
- Objective 4: Demonstrate that EM is more cost effective than at-sea observers.
- Objective 5: Improve salmon bycatch accounting for catcher vessels, especially for those delivering to tender vessels, through the use of EM camera systems that will enable shoreside observers to collect salmon bycatch census data.

NEED FOR EFP

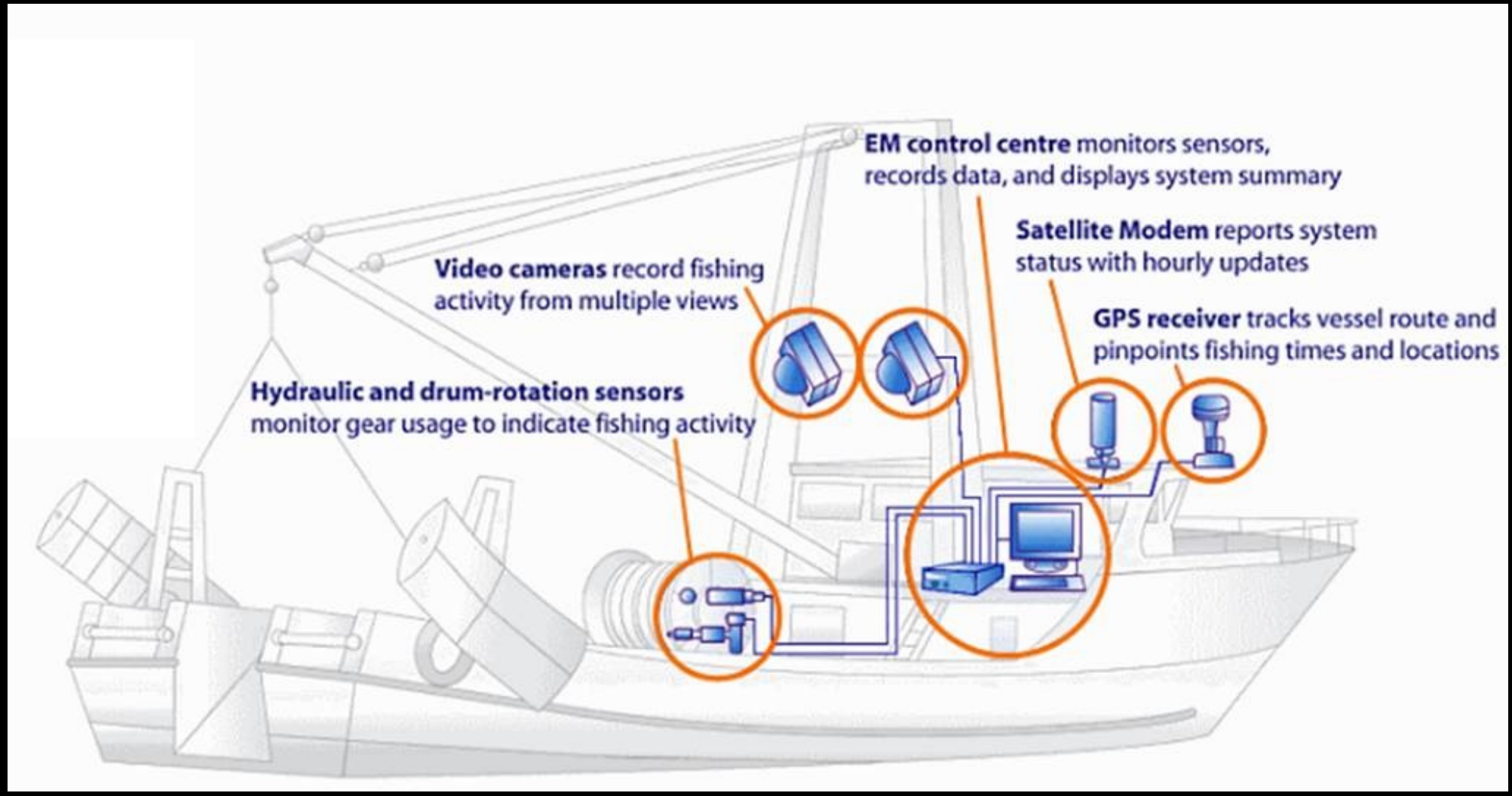
- To provide exemptions for participating vessels from current regulations related to onboard observer coverage and vessel discard requirements stemming from the GOA pollock trip limits, maximum retainable amounts, and PSC.

2019 PILOT TESTING ON BS AND GOA SHORESIDE CATCHER VESSELS

- 27 EM systems were deployed while simultaneously carrying human observers when required.
- As of August 2019, 164 hard drives from 24 vessels received; 145 hard drives reviewed.
- Covered 431 pollock trips and 996 hauls with recorded fishing activity.
- No major video data quality issues reported.

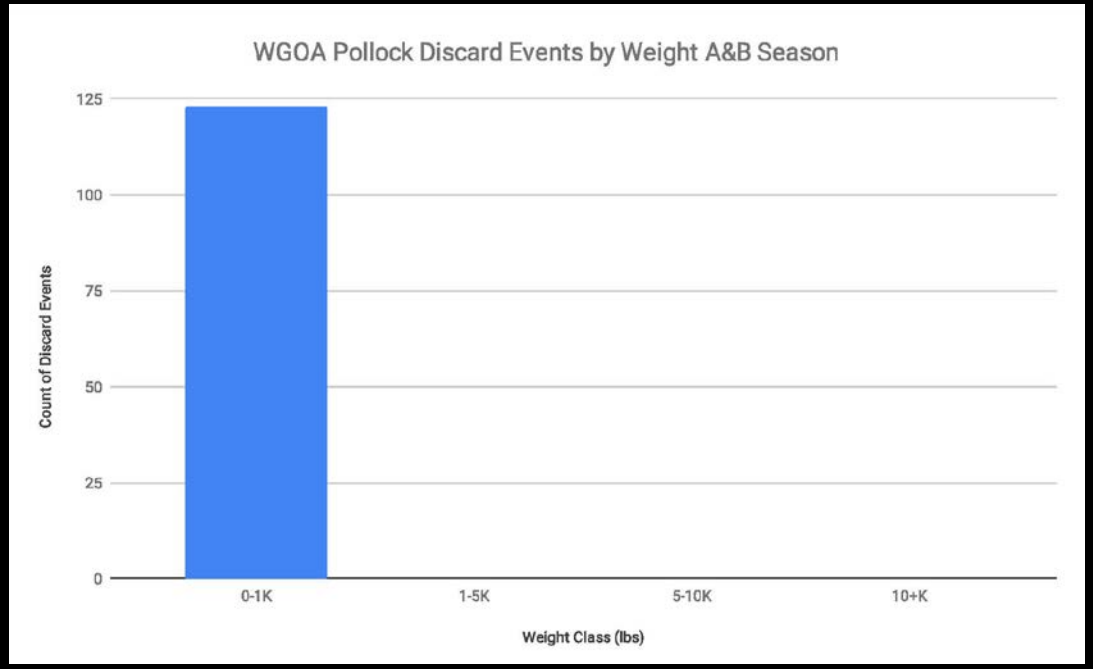


EM System


EM control centre monitors sensors, records data, and displays system summary
Satellite Modem reports system status with hourly updates
Video cameras record fishing activity from multiple views
GPS receiver tracks vessel route and pinpoints fishing times and locations
Hydraulic and drum-rotation sensors monitor gear usage to indicate fishing activity

2019 PILOT TESTING ON WGOA CATCHER AND TENDER VESSELS

- EM systems were deployed on 15 WGOA CVs and two tender vessels while simultaneously carrying human observers.
- As of May 2019, 24 hard drives received (three from tender vessels and 21 from catcher vessels) and all were reviewed.
  - Covered 32 trips from ten of seventeen vessels (two trips from tender vessels and 30 trips from CVs).
- 125 individual discard events were recorded.
- Successfully demonstrated that EM provides adequate monitoring of the chain of custody for deliveries that utilize tender vessels.



MAJOR LESSONS LEARNED FROM 2019 PILOT TESTING

- Video reviewers had an inability to estimate discard weights by species so access to fish ticket record numbers and fish ticket landings data generated from EM deliveries will be provided. The proportion of species (by weight) on the fish ticket will allow the video reviewer to apply that proportion to the recorded EM discard data for speciation.
  - Another benefit of access to fish ticket data will be the ability for the reviewers to check logbooks received against the landings data (i.e., the video reviewer would have the ability to verify that they received the corresponding logbooks and hard drives and follow-up with the fishermen if they have not).

OTHER LESSONS LEARNED

- Some logbooks received did not indicate metric tons or pounds for catch and discard estimates. Vessel operators will be required to make an appropriate selection
- Visual estimates of discarded catch when a vessel discards a partial codend before bringing it on deck will be done similar to protocols for a human observer. EM cameras have the advantage of recording all partial codend discards before bringing the remaining haul on board the vessel (via specific camera placements).
- The development and use of VMPs and FAQ documents to communicate requirements to vessel operators. Direct communication with vessel owners, vessel operators, and EM service providers for execution of individual catcher and tender vessel responsibilities while using EM.

Responses to AFSC Comments

Comment #	EFP Page #	Summary of Response
1 Spatial Data	12-13	Fishing location still available via GPS (EM) and VMS (by regulation). Both projects piloting e-logbooks designed to meet NOAA requirements.
2 QA/QC	12	EM providers for both projects will employ standardized QA/QC protocols (outlined in EFP).
3 Summary Reports	15	Biannual summary reports include metadata, logbook/EM comparisons, discard information and serve as audit of catch/discard recorded on fish tickets. Provided to AKRO, Trawl EMC, NPFMC as appropriate.
4 Discards	10	Figure: Pollock Discard Events by Weight, 2019
5 EFP Function	6	EFP is designed to be a learning process. If necessary, year 2 can be modified through EFP modification process.
6 Definitions	17	Allowable retention/discards and "proper recording" further defined. Critical to have flexibility in Year 1 to learn and adjust discard categories/limits as needed.
7 Seabirds	18-19	Vessel behavior not expected to change, still required to report encounters with threatened/endangered species as outlined in USFWS regulation. Stern ramp and horizon cameras provide good views for monitoring potential interactions.
8 Marine Mammals	18	Reviewers will provide visual weight estimations. EFP team working with appropriate agencies to discuss potential technological solutions.

EFP Scope and Technical Details

- Species retention and discard data will be collected by EM systems on participating vessels
  - EM is intended to accurately capture discard events (whether a discard has occurred), the amount of discard (estimated volume in weight), and rare events (e.g., large animals, gear failure).
- All (100%) video data will be reviewed from each EM trip for compliance monitoring purposes to ensure that all salmon make it to the shoreside plant for the census count.

EFP Scope and Technical Details

- Area of Exempted Fishing: Bering Sea and Gulf of Alaska (NMFS Areas 610, 620, 630, and 640)
- Duration: Two years covering all 2020 and 2021 pollock fishing seasons
- Catch Accounting: EM will not be directly utilized for catch accounting purposes; accounting of a vessel's catch will be done via fish tickets (eLandings and tLandings reports) and a census of PSC will be done at the shoreside processing facility via a shoreside plant observer, both of which will be provided to NMFS.

EFP Scope and Technical Details – Observer Coverage

- In the BS, catcher vessels will be exempted from the 100% observer coverage requirement. All pelagic pollock fishing by participating vessels will be considered EFP fishing.
- In the GOA, rather than a specific exemption, vessels will select EFP/non-EFP trip through ODDS. Vessels selecting an EFP trip will be placed in a zero-selection pool for partial coverage fisheries. EFP trips are only allowed for federal pelagic pollock trips.

EFP Scope and Technical Details – Observer Coverage

- Specific Tender Provisions:
  - If an EM CV selects an EFP trip in ODDS, they must deliver to an EM EFP tender.
  - EFP tenders that accept EFP catch cannot also accept non-EFP catch during the same trip, until EFP catch has been offloaded shoreside.
  - Tenders cannot mix EFP catch from different NMFS reporting areas in the same trip.
  - EFP tenders (and EFP shoreside CVs) must completely offload EFP catch at a single processing plant (no partial offloads).

EFP Scope and Technical Details – Vessel Monitoring Plans (VMPs)

- Each participating vessel will have a VMP that outlines all of the requirements and vessel operator responsibilities, documents the location and purpose of EM camera system components, and describes the specific catch handling and discard locations that the vessel can use.
- An additional component of the VMPs will be Malfunction Protocols that detail the specific steps a vessel must take if an equipment malfunction were to occur at the dock or at sea.

Scope and Technical Details – Vessel Participation and Responsibilities

- For 2020, 49 catcher vessels and nine tender vessels are anticipated to participate:
  - BS/GOA component: 28 vessels(10 BS only, 8 GOA only,10 BS-GOA)
  - WGOA component: 21 WGOA vessels and nine tenders
- Pre-trip preparation: Work with EM service providers to develop VMPs, preform system function tests, and ensure EM systems are operating correctly.
- During a Trip: Record required vessel logbook information including the estimated amount of catch and discards by species, a total haul weight estimate, codend capacity, each stat area fished, lat/long for each haul, set/haulback times, the ODDS trip number for GOA vessels, and any EM system malfunctions.

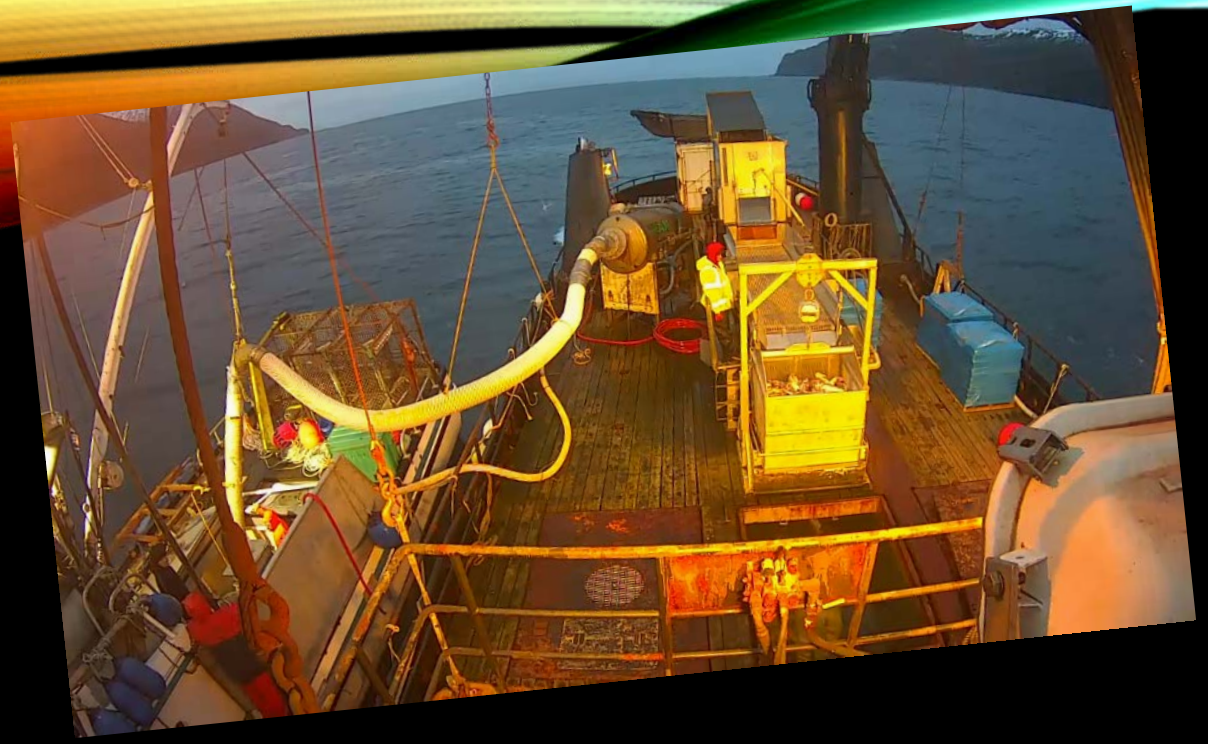
Scope and Technical Details – Post-trip: Video Data Disposition (BS/CGOA project)

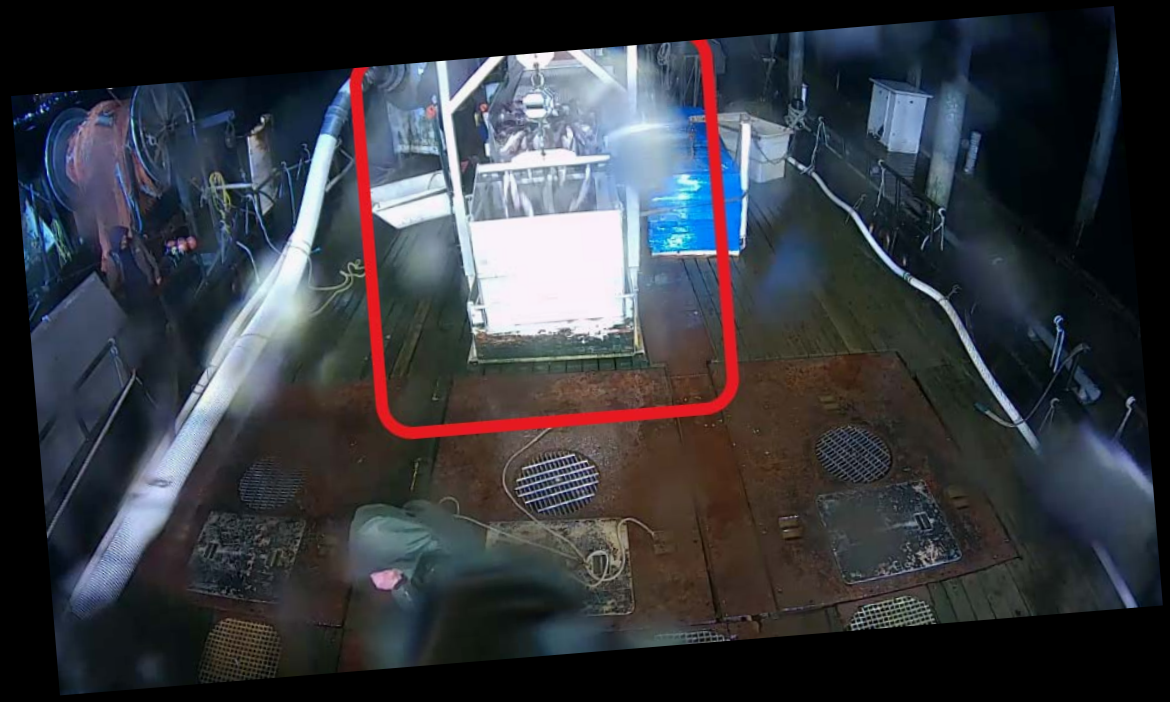
- Upon completion and delivery of up to five pollock fishing trips per hard drive, vessels will mail their hard drives (or provide them to the shoreside plant to mail) and send copies of their logbook data to PSMFC within 24 hours of delivery completion. Hard drives and envelopes will be provided to ports of delivery to facilitate ease of mailing.
- Video reviewers will be given access to the fish ticket record numbers and fish ticket landings data generated from EM deliveries which will allow reviewers to track deliveries and ensure that logbook pages corresponding to those deliveries have been received. Reviewers will compare video/logbook discard data, speciate any discards, and transmit this information to the NMFS AKRO upon completion.

EFP Scope and Technical Details – Post-trip: Video Data Disposition (WGOA project)

- Catcher vessels have two options for delivery:
  - Shoreside – mail hard drives/logbooks within two business days upon completion of up to 3 trips per hard drive or within two weeks of collecting data (whichever is sooner).
  - Tender – deliver hard drives to tenders who will maintain Chain of Custody Log to track incoming hard drives/logbooks; tenders will mail within two business days of delivery.
- Hard drives and envelopes will be provided to tenders as well as processors.
- All data are mailed to Saltwater, Inc as the third-party video reviewer.
- Video reviewers will be given access to eLandings, with additional emphasis on tracking the tender Chain of Custody by matching date/time of deliveries.

IMAGES OF TENDER OPERATIONS





EFP Scope and Technical Details – Vessel Feedback

- Vessel feedback will be communicated directly to the vessel by the EM service provider and by the data review contractor.
- After each data drive is reviewed, a drive report that summarizes overall data quality and the vessel's adherence to the program requirements for logbook submission, species retention, and malfunction reporting will be provided to the vessel.

EFP OPERATIONS: Species Retention

- Participating CVs will operate as a maximize retention fishery such that all catch is landed.
- Limited exceptions will be made for:
  - Pollock and other small incidental species removed from the deck and fishing gear during cleaning and other similar vessel operations.
  - Large individual marine organisms, such as fish species longer than six feet in length, provided the species, estimated weight, and the reason for discarding are properly recorded in the vessel logbook.
  - Unavoidable discard of catch resulting from an event that is beyond the control of the vessel operator or crew provided that the estimated weight of all discarded species, the tow number, and reason for discarding are recorded in the logbook.

LIMITED EXCEPTION: SHARK DISCARD EVENT

EFP OPERATIONS: Prohibited Species

- All prohibited species (salmon, halibut, crab, and herring) will be retained, sorted, and enumerated at the processing plant along with any groundfish species on PSC status.
- Full salmon accounting in the BS and GOA will continue and the appropriate biological samples will collected by shoreside observers based on the currently defined sampling regime.
- Participation in the Prohibited Species Donation Program (Sea Share) provides an exception to allow retention of halibut PSC. All currently active GOA and BSAI processors are listed on the current PSD Program permit.

EFP OPERATIONS: Maximum Retainable Amounts (MRAs)

- All catch of MRA species will be retained by participating vessels and sorted/weighed at the processing plant.

- Due to the dual nature of management for groundfish retention between NMFS and the State of Alaska, a discard exemption for MRA and non-salmon PSC species will be required from both NMFS and the State of Alaska.

EFP OPERATIONS: GOA Pollock Trip Limits

- GOA EFP vessels will be required to retain all pollock in excess of the 300,000 lbs. trip limit.
- The EFP applicant and collaborators are working with NMFS to develop the appropriate performance standards to meet the intent of the GOA pollock trip limit and MRA limits while still meeting the EFP goal of minimizing at-sea discards (maximized retention). All ex-vessel value above the regulated limits (the overage portion) will be surrendered by the participating vessels and reported as overages by the shoreside processor.

EFP OPERATIONS: Marine Mammals

- All incidentally caught marine mammals will be discarded, provided they are documented in the vessel logbook and reported to NMFS Office of Protected Resources. The EFP applicants will work with NMFS to develop a reporting process for any incidental takes of marine mammals by participating EFP vessels.
- Physical collections of marine mammal biological samples will not be collected from participating vessels, but the EM system will record marine mammal interactions and other sightings (e.g., a mammal taken in the codend of the trawl net or a mammal jumping onto the deck of a vessel).
  - Reviewers currently provide weight estimations for sharks and will also provide visual weight estimations for any marine mammal takes that occur.

EFP OPERATIONS: Sea Birds

- Vessels will be required to complete a Threatened and Endangered Bird Species Encounter Reporting Form (USFWS) when an encounter occurs for Short-tailed albatross, Spectacled eider, Steller's eider or other ESA listed species.
- EM camera configuration on board participating vessels include both a stern ramp view and a wide-angle horizon view camera. While these cameras were not intended to monitor bird interactions, both the stern view camera and horizon view camera together provide good views of the third wire so any potential seabird interactions can be noted.

EFP OPERATIONS: Sea Birds

EFP OPERATIONS: Shoreside Plant Observations and Biological Samples

- All EM pollock deliveries (100%) in the BS will be made to shoreside processing facilities with an additional dedicated plant observer to ensure precise PSC Chinook salmon accounting and the collection of biological samples.
  - This will ensure that individual vessel-level accountability for both Chinook salmon and pollock will be maintained.
- Shoreside pollock deliveries in the GOA (EM catcher vessels and EM tender vessels) will be sampled by a plant observer at a rate that results in 30% of the total Gulf-wide EM shoreside deliveries being monitored.
  - This will result in a 100% salmon census at the trip level for these deliveries.
- At those shoreside processing facilities with an additional plant observer, a random sampling scheme will be developed (and approved by NMFS) for the collection of pollock biological samples (sex/length/weight/otoliths) from a vessel's entire catch.

Metrics for Gauging Success of EM as a Compliance Monitoring Tool

Council Objective	Category	Metric
1, 3	Electronic monitoring equipment reliability and malfunctions	# and type of EM equipment malfunctions
1, 2, 3	Functionality of vessel feedback loop between the vessel operator and the EM service provider/third party reviewer	Frequency and type of communications How system malfunctions encountered were addressed
3	Discrepancies between vessel logbook and video discard estimates	# and scale of occurrences Comparison to 2019 observer estimates from Pilot Phase
2	Cost metrics between EM and human observers	Cost comparison of EM vs. human observer onboard a vessel
4	Changes in vessel fishing behavior due to a relief from current discard requirements	# of occurrences and amount of significant changes in deliveries of: MRA species; PSC species (other than salmon); trips in excess of 300,000 lbs (in GOA)
1, 2, 3, 4	Impacts to shoreside monitoring	Time and cost of additional shoreside observers
1, 2, 3, 4	Impacts to tendering operations	# of EFP trips affected (unable to count as EFP) # operations changed to accommodate EFP vessels
3, 4	Impacts to the current collection of biological samples for pollock	Time associated with shoreside pollock sampling responsibility Comparison of current vs. EFP shoreside biological data collected
3, 4	Impacts to marine mammal monitoring	Identify what data EM can provide Identify potential impacts to management
1, 2, 3, 4	Challenges in meeting the terms of the EFP	To be identified

EXPECTED OUTCOMES AND MEASURE OF SUCCESS: EM Equipment Reliability and Function

- Hypothesis: EM camera systems will function with limited malfunctions and will provide unobstructed views of all fishing operations and ensure that no salmon were discarded at sea.
- Potential Ways to be Addressed: If the number and type of malfunctions impacts reliability of video data, EFP applicants can work with the EM service providers to:
  - Increase number of cameras on board vessel
  - Increase number of back-up parts on board vessel
  - Enhance training of vessel crew
  - Increase/enhance training of shoreside technicians

EXPECTED OUTCOMES AND MEASURE OF SUCCESS: Impacts to Collection of Pollock Biological Samples

- Hypothesis: Collection of pollock biological samples can be achieved at the shoreside processing plant without an impact to data quality.
- Potential Ways to be Addressed: If the level of pollock biological information collected at the shoreside processing facility does not meet necessary data quality needs, the EFP applicants can:
  - Work with the shoreside observer provider to assess if time constraints associated with sampling an entire delivery are impeding the collection of sex/length/weight/otoliths.
  - Work with NMFS/FMA/stock assessment authors to assess the random sampling scheme implemented and/or data information flow.

EXPECTED OUTCOMES AND MEASURE OF SUCCESS: Impacts of Tendering Operations

- Hypothesis: Complete chain of custody for EM catcher vessels delivering to EM tenders can be monitored without impacting fishing operations or creating inefficiencies.
- Potential Ways to be Addressed: If completing the chain of custody impacts typical tendering operations, the EFP applicants can:
  - Work with NMFS/FMA staff to re-evaluate current tender provisions
  - Communicate and work with the processor and fishermen to coordinate logistics and fishing operations as closely as possible pre-season to predict tendering needs.
  - Coordinate with the processor to purchasing portable EM equipment that can be quickly and easily transferred between tender vessels. The system is designed so any crew member can be guided through installation and calibration over the phone with the EM provider.
  - Require EM catcher vessels to deliver shoreside.

Questions?

The development of this EFP has been a fully collaborative process from the beginning and will continue as such throughout its execution!!