



# Operational Testing Plan for Standard EM Systems on the Alaska Fixed Gear Fleet 2015 Alaska Cooperative Research Program

Howard McElderry  
Archipelago Marine Research Ltd.

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# EM Implementation Pathways

- **Traditional Approach: Proof of Concept**
  - Does it work?
  - Can it provide the same data as an observer?
  - (What does it cost?)
- **Suggested Approach: EM Program Design**
  - How can we make EM work recognizing that:
    - EM is not a 'plug and play' replacement for observers, and
    - An alternative to observers is needed.

# EM Program Design is a Balancing Act

## Information Needs:

- Quantity
- Quality
- Timeliness



## EM Program

### Considerations:

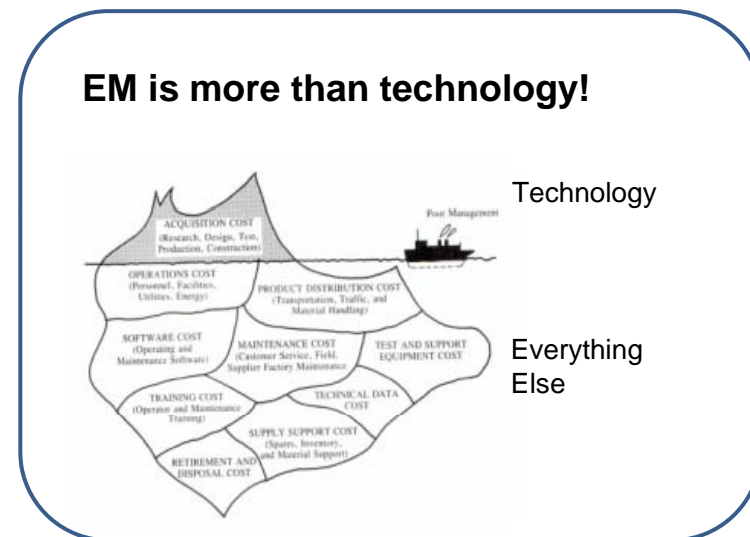
- Technology
- Program Operations
- Vessel Obligations

## Fishery Context:

- Available Funds
- Fishery Characteristics
- Other Information Sources

# EM Program Considerations

- Technology
  - Feature Set and Functionality
  - Cost
  - Fleet Suitability
  - Availability
  - Scalability Across the Fleet
  - Performance
- EM Program Operations
  - Program Oversight
  - Data Services
  - Field Services
- Vessel Obligations
  - Duty of Care
  - Catch Handling Requirements
  - Supplementary Data





# Alaska Fixed Gear Fishery

## Characteristics

### < 40' Fleet

- Vessels – ~490
- Landings – ~2,500
- Days - ~6,500
- Season – June to Sept.
- Target – Mostly Halibut
- # Ports - 43
- Top Ports (50%) – Homer, Sitka, Kodiak, St. Paul, Yakutat
- Fleet Activity (annual)
  - 80% make 4 trips or less
  - 75% fish 15 days or less

### 40' – 57.5' Fleet

- Vessels – ~380
- Landings – ~2,150
- Days - ~9,400
- Season – Jan to Oct.
- Target – Halibut/ Sablefish
- # Ports - 30
- Top Ports (50%) – Homer, Juneau, Sitka
- Fleet Activity (annual)
  - 80% make 5 trips or less
  - 75% fish 20 days or less



# AK Fixed Gear Fishery Catch Composition

## Pacific Cod

- Top 5 Catch (90%)
  - Pacific Cod
  - Soft Snout Skate
  - Pollock
  - Yellowfin Sole
  - Halibut
- # Catch Profile\*
  - ~150 Categories
  - 8 are Common
  - 56 are Uncommon
  - 91 are Rare

## Sablefish

- Top 5 Catch (90%)
  - Grenadier
  - Sablefish
  - Thornyhead RF
  - Halibut
  - Roughey RF
- # Catch Profile\*
  - ~110 Categories
  - 10 are Common
  - 41 are Uncommon
  - 59 are Rare

## Halibut

- Top 5 Catch (75%)
  - Halibut
  - Pacific Cod
  - Sablefish
  - Dogfish
  - Grenadier
- # Catch Profile\*
  - ~100 Categories
  - 14 are Common
  - 37 are Uncommon
  - 64 are Rare

\* Common (>1.0% frequency); Uncommon (0.01 to 1%); Rare (<0.01%)



# AK Fixed Gear Fishery Species Resolution for Management

## FMP by Species

### Common Species

- ✓ Halibut
- ✓ Pacific Cod
- ✓ Sablefish
- ✓ Longnose Skate
- ✓ Pollock
- ✓ Shortraker /Rougheye RF

### Uncommon Species

- ✓ Atka Mackerel
- ✓ Big Skate
- Dusky RF
- Flathead Sole
- Northern Rockfish
- ✓ Pacific Ocean Perch
- ✓ Arrowtooth/Kamchatka

### Rare Species

- Rex Sole

## FMP by Group

### Common Species

- ✓ Thornyhead RF
- ✓ Sculpins
- ✓ Sharks
- ✓ Skates
- ✓ Grenadier

### Uncommon Species

- ✓ Demersal Slope RF
- ✓ Rockfish
- ✓ DW Flatfish
- ✓ SW Flatfish

## PSC-Protected Species

### Uncommon

- King Crabs
- Tanner Crabs

### Rare

- Coho Salmon
- Chum salmon
- Seabirds

## Timing – In Season - Critical

### Common Species

- ✓ Halibut
- ✓ Pacific Cod
- ✓ Longnose Skate
- ✓ Shortraker /Rougheye RF
- ✓ Thornyhead RF

### Uncommon Species

- ✓ Big Skate
- ✓ Demersal Slope RF

### Rare Species

- Laysan Albatross
- S/T Albatross

## EM Identifications:

✓ High

➤ Low or Unknown



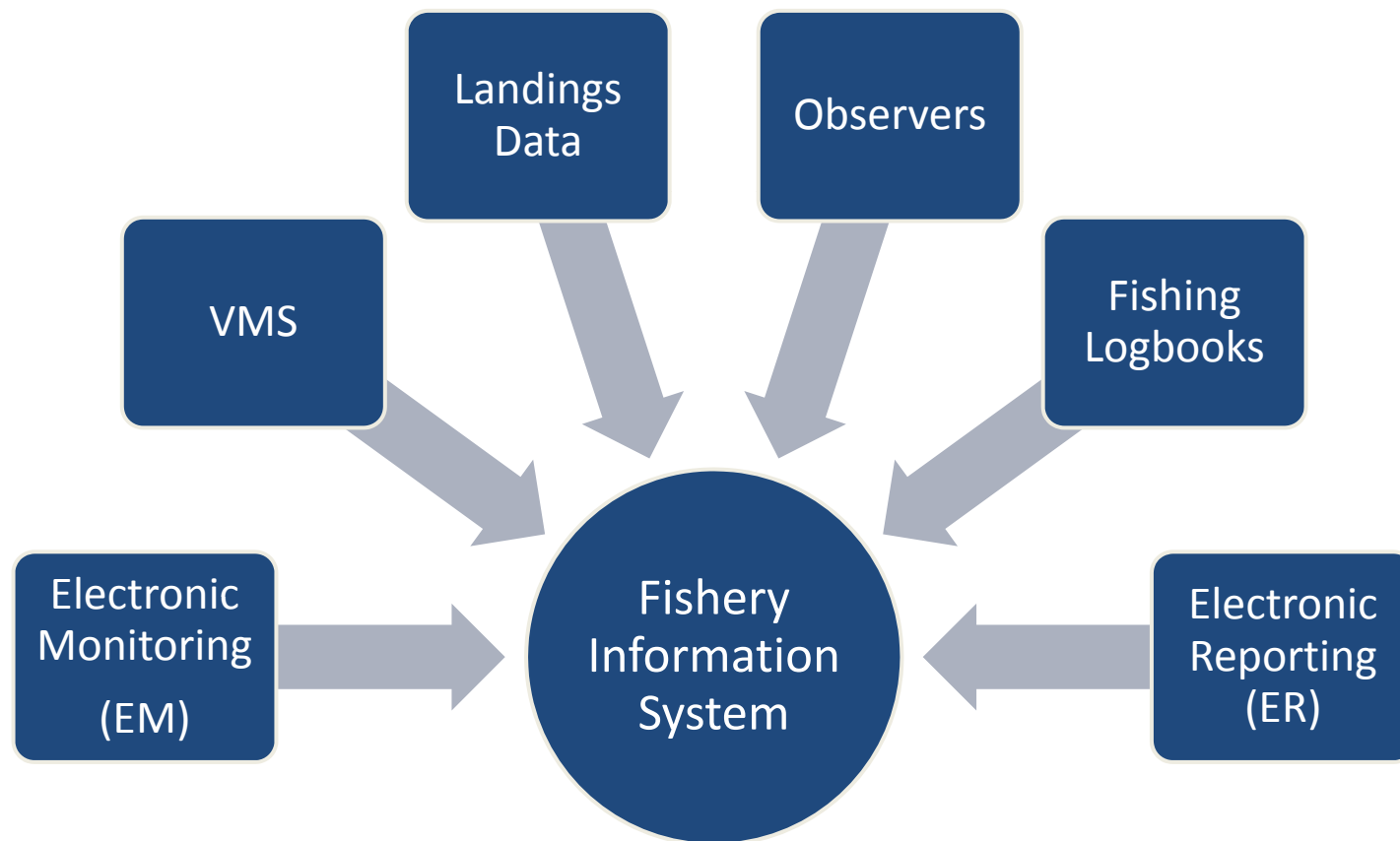
# Design Conclusions

- Many vessels, many landing ports, large geography, and low activity per vessel results in a complex fleet sampling design which will likely require several vessels across a number of ports.
- EM must be robust, easy to install and service, simple to operate, and portable for scalability.
- EM must have a very low failure rate <1% to avoid 'hidden bias'.
- Vessel obligations for EM success must be simple and have low operational impact (short learning curve).
- EM data should not be the same standard as observer data; outputs should meet management needs and be complimentary with observer data and other information sources.
- EM should be thought of as one element of an integrated fishery information system.





# The Integrated Fishery Information System





# 2015 Field Program Objectives

## 1. Operational Testing and Capacity Building

- Regional Capacity Building in Two Ports (Sitka, Homer)
- Deployment of EM Systems – 13 vessels, 3 fisheries
- EM ‘Socialization’ with fleet
- Testing EM Suitability Across a Spectrum of Vessel Attributes
- Develop Operational Specifications for Vessels and Port Operations.

## 2. Cost Analysis

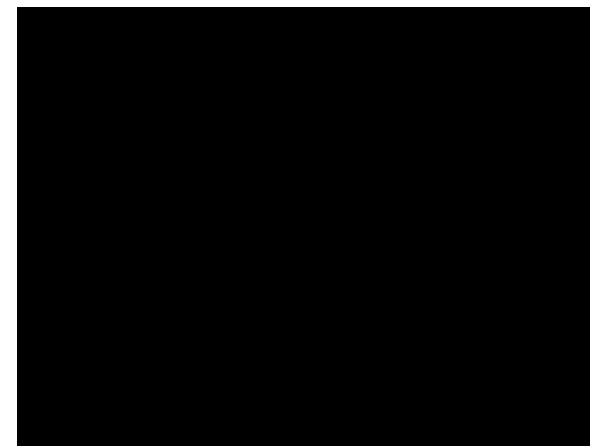
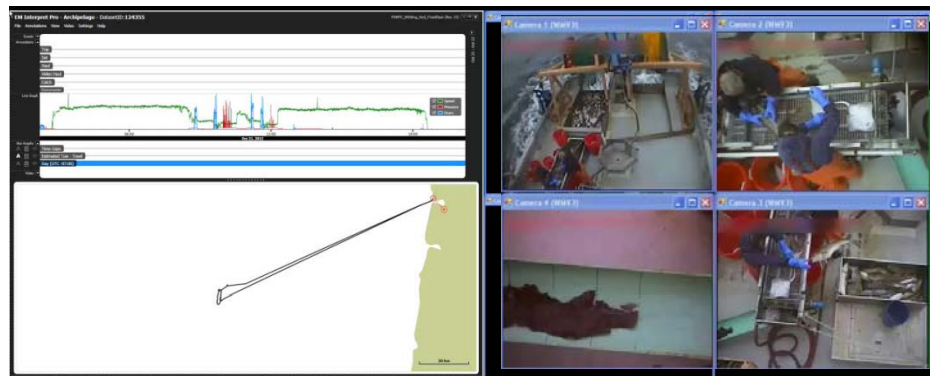
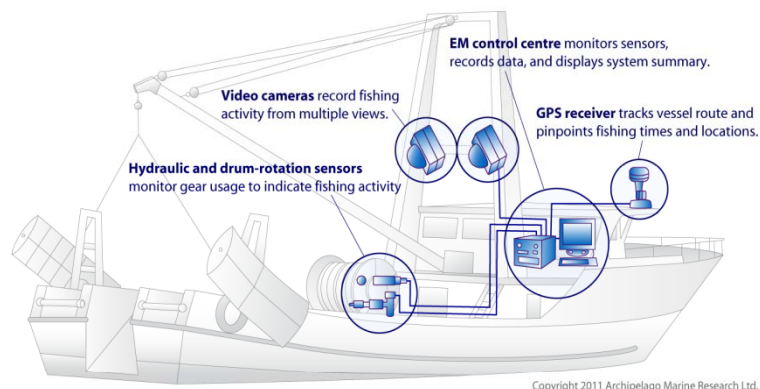
- Oversight
- Technology
- Field Services
- Data Services
- Vessel Impact

## 3. Data Quality Assessment

- EM Data Recording Performance
- Species Identification
- Vessel Compliance



# EM Technology



At Sea Data Recording System

Land Based EM Data Analysis System



# Monitoring Options

Monitoring Obligation	Monitoring Option				
	# 1	# 2	# 3	# 4	# 5
At-Sea Observer	X				
Effort logbooks			X	X	X
Catch logbooks					X
Standard duty of care		X	X	X	X
Catch control points		X	X	X	X
Restricted discard location		X	X	X	X
Discard measurement grid				X	



# Enhanced EM Program Operational Overview

- ‘Standard’ EM System (3-4 cameras, hydraulic and winch sensor, GPS, control center)
- EM system recording sensor data 24/7 on fishing trip,
- CCTV records during setting and hauling only with views of:
  - Catch Retrieval at Rail and On Deck
  - Catch Discard Locations
  - Setting Operations for Seabird Streamer Performance.
- Participating Vessel
  - Duty of Care
  - Catch Control Points
  - Special Catch Handling Requirements
  - Effort Logs
  - EM Service Upon Landing
- Landings Monitoring (full RF retention trips only)



# Enhanced EM Program

## Key Information Tactics

### Primary Sampling Unit:

- Fishing Event (retrieval operation).

### Discard Estimates:

- Catch are identified, enumerated and fate determined during retrieval operations.
- Weight of discarded species is estimated by applying piece counts with 'borrowed' average piece weights;
- Fishery level species discards are estimated by expansion of the samples to fleet grouping, area and fishery; and
- Expansions are based on hooks set from effort logs.

### Trip Level Catch Estimates (Managed Species)

- Landings data provide the trip (vessel) and fleet level total landed catch; and
- IFQ and ACL data are summed from landings data.



# Estimated Data Volumes

Port	2015 Participants	Other Potential
Sitka	8	0
Homer	5	3
Kodiak		3
Petersburg		2
Ketchikan		1
Haines		1

Port	Sitka	Homer	Total
<b>Port-Months</b>	6	6	12
<b>EM Systems</b>	8	5	13
<b>Vessels</b>	8	5	13
<b>Total Trips</b>	30	25	55
<b>Total Hauls</b>	240	200	440



# Vessel Attributes

- Vessel Configuration
  - Fwd/Aft Wheelhouse, Shelter Deck, Side/Stern hauler
- Fishing Gear
  - Snap, Fixed, Autoline
- Deck Gear
  - Drum, Sheave, Autoline
- Cameral Locations
  - Outrigger Pole, Davit
- EM System Component Locations
- Fishing Characteristics
  - Lighting Conditions, Weather and Sea Conditions)





# Project Team

## **Archipelago Marine Research Ltd.**

- Equipment Provision
- Program Oversight
- EM System Installation
- Port Services Development
- Operational Data Gathering
- Operational Assessment Report

## **Port Services Contactors**

- EM System Maintenance Services
- Landings Monitoring (w/ full retention RF trips)
- Local Data Analysis
- Participant Interviews

## **Pacific States Marine Fisheries Commission**

- EM Data Processing
- Data Quality Assessment Report

## **North Pacific Fishery Management Council**

- Fishery Characterization Data
- Historical Fleet Activity Data
- Cost Analysis Framework
- Cost Analysis Report

## **NMFS**

- Fishery Characterization Data
- Management/Science Information Needs
- EM Fleet Sample Design
- Information Integration Roadmap

## **Alaska Longline Fishermen's Association**

- Port and Fleet Logistics
- Fleet Suitability Assessment
- Operational Impacts Assessment

## **Participating Vessels**

- Host EM Systems
- Duty of Care Responsibilities
- Onboard Catch Handling Measures
- Communication with Program Staff
- Landings Monitoring
- Exit Surveys



# Project Timeline

- Program Set up (January/February, 2015)
  - Program design completed: January, 2015
  - Program presentation to SSC: February, 2015
  - Port Services Established: February, 2015
  - Vessel Installations Begin: Late February, 2015
- Operations (Late February to July, 2015)
  - Participant Vessels Monitored: (Late February to July, 2015)
  - Landings Monitoring: (Late February to July, 2015)
  - EM Data Analysis: (Late February to July, 2015)
- Program Reporting: (July to December 2015)



*Thanks!*