Observer and Electronic Monitoring Data Used in Fisheries Management

NOAA FISHERIES

Office of Science and Technology

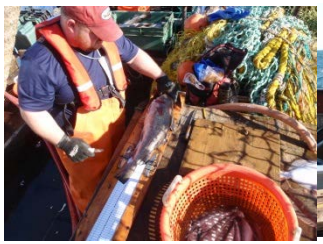
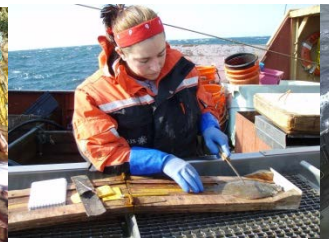
Silver Spring, MD

Liz Chilton & Brett Alger

Council Member Training

Silver Spring, MD

October 31, 2017



Overview & Learning Objective

- National and Regional Observer Programs
- Observer Data Collection feeds Fisheries Management
- National and Regional Electronic Technology Strategies

Fisheries Observers and Management

Fisheries Observers and At-Sea Monitors

- Field biologists deployed on commercial fishing vessels
- Collect fishing effort and biological data from target fishery and discarded fish (*fishery dependent data*)
- Monitor vessel activity for compliance with fishing regulations
- Fishery dependent data used in stock assessments
- Supports inseason management of fisheries

National Observer Program (Inception 1999)

Responsibilities

- Advocate observer issues at the national level
- Develop policies and procedures supporting NOAA Fisheries observers and regional observer programs
- Enhance data quality and achieve consistency in key areas of national importance

Responsibilities of Regional Observer Programs

- Sampling protocols and coverage levels
- Safety training
- Observer deployment
- Observer debriefing
- Data management
- Data analysis

Deployed 891 observers / 73,743 sea days / 53 fisheries (2016)

Responsibilities of Deployed Observers

Collect Fishery Dependent Data

- Fishing Effort, Gear Type and Location
- Biological samples (length, sex, maturity and age structures)

Monitor fishing and support vessel safety compliance

- Magnuson-Stevens Act (MSA)
- Marine Mammal Protection Act (MMPA)
- Endangered Species Act (ESA)
- US Coast Guard commercial fishing vessel regulations

Commercial Fishing Effort Data

For every observed haul/set collect:

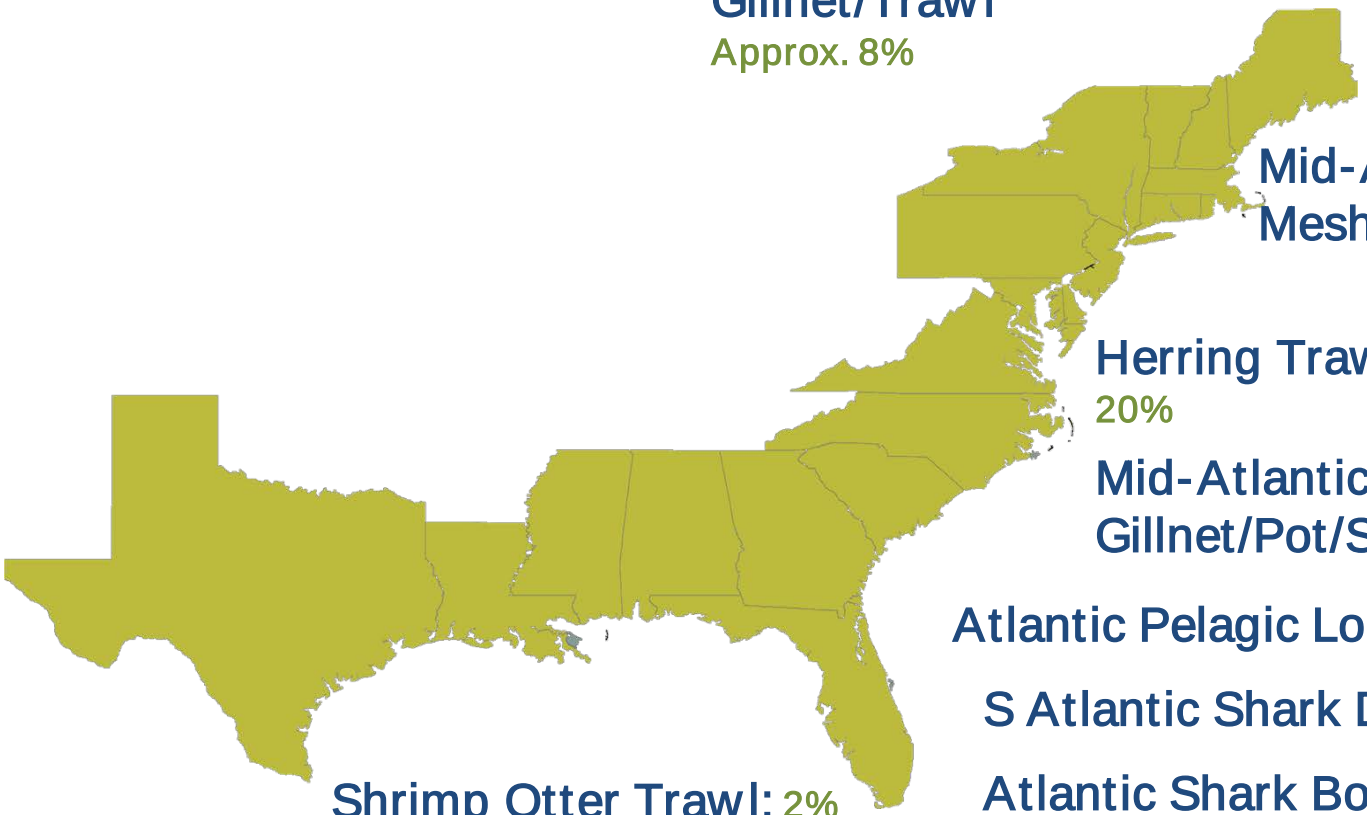
- Date and time of fishing activity
- Latitude and longitude of gear
- Depth of catch
- Gear type and mesh measurements
- Vessel characteristics
  - ➢Type, permit number, length
- Vessel catch estimates

Biological Samples and Compliance Monitoring

- Species composition from fish for individual hauls
- Total catch estimates
- Discarded catch data
  - Non-target species
  - Prohibited fish or invertebrates
  - Incidentally caught marine mammals or endangered seabirds

U.S. Observer Programs

Atlantic Ocean and Gulf of Mexico 2016 coverage



NE Groundfish Gillnet/Trawl
Approx. 8%

NE Scallop Dredge
5-20% based on permit type & area fished

Mid-Atlantic Large & Small Mesh Trawl: <8%

Herring Trawl (incl. Pair Trawl): 20%

Mid-Atlantic Coastal Gillnet/Pot/Seine: <8%

Atlantic Pelagic Longline: 10%

S Atlantic Shark Driftnet: 38%

Atlantic Shark Bottom Longline:
Approx. 5%

Shrimp Otter Trawl: 2%

Reef Fish: 3% combined

North Pacific (Alaska) 2016 coverage

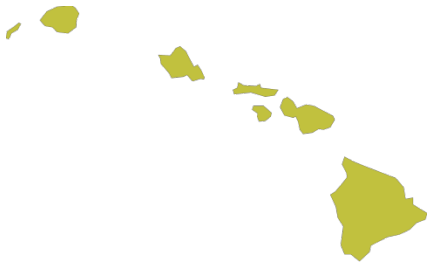
Bering Sea/Aleutian Islands/
Gulf of Alaska cooperatives: 100%

Bering Sea/Aleutian Islands/
Gulf of Alaska Groundfish & Halibut
Trawl/Longline/Pot: 10-14%

Pacific Ocean and Western Pacific 2016 coverage

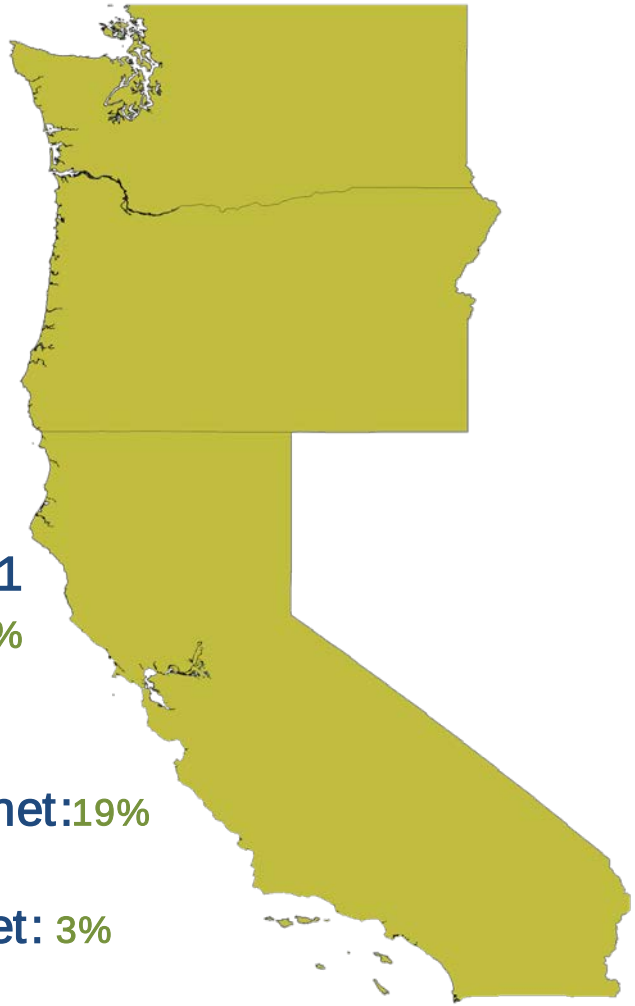
West Coast Trawl Catch Shares
100%

West Coast Groundfish
Non-Catch Share Fisheries
Approx. 1-25%, based on permit type



Hawaii/American Samoa
Pelagic Longline: In HI, 20% for tuna, 100% for swordfish
In American Samoa, 20%

CA Pelagic Longline (1 vessel): approx. 75%



CA Large-Mesh Drift Gillnet:19%

Southern CA Set Gillnet: 3%

Electronic Monitoring in U.S. Fisheries

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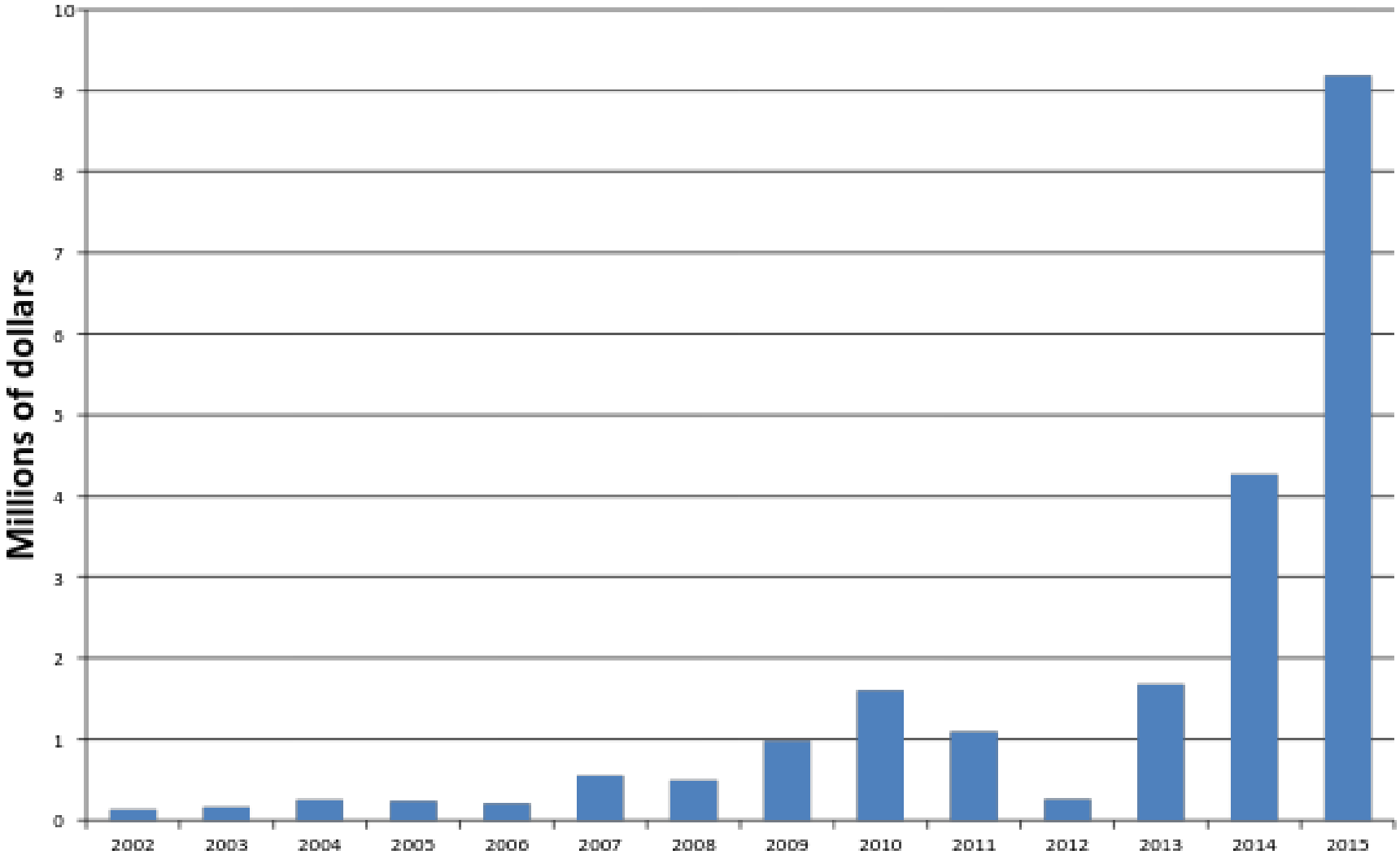
Electronic Technology Policy Directive (2013)

- Guidance for fishery-dependent data collection
  - Vessel monitoring systems (VMS), electronic monitoring (EM), and electronic reporting (ER)
- Objectives
  - Encourage adoption of electronic technologies (ET)
  - Complement/improve existing programs
  - Cost-effective and sustainable implementation
  - Align management goals, data needs, funding sources, and regulations
  - Coordinate Agency and industry costs

Electronic Technology Policy Directive (2013)

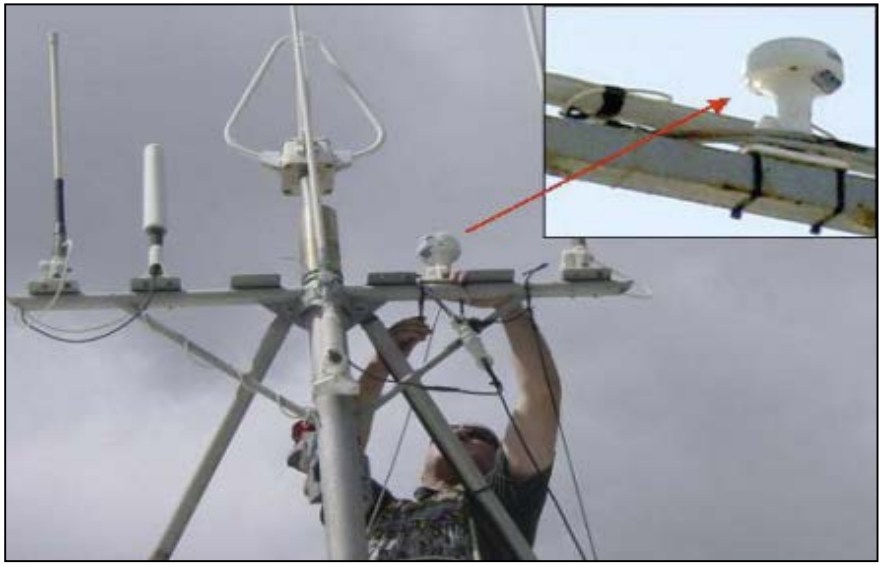
- Authorities and Responsibilities
  - NOAA Fisheries Science Board and Regulatory Board
    - Support from Office of Policy, Sustainable Fisheries, and Science & Technology
    - National ET Working Group includes regional staff
  - Regional Administrators and Sustainable Fisheries
    - Consult Science Centers, Councils, States, Commissions, industry, and other stakeholders
- Measuring Effectiveness
  - Assess progress towards implementation
  - Bi-annual review by Science and Regulatory Boards

Electronic Technologies Funding



DATA

Hydraulic pressure sensor

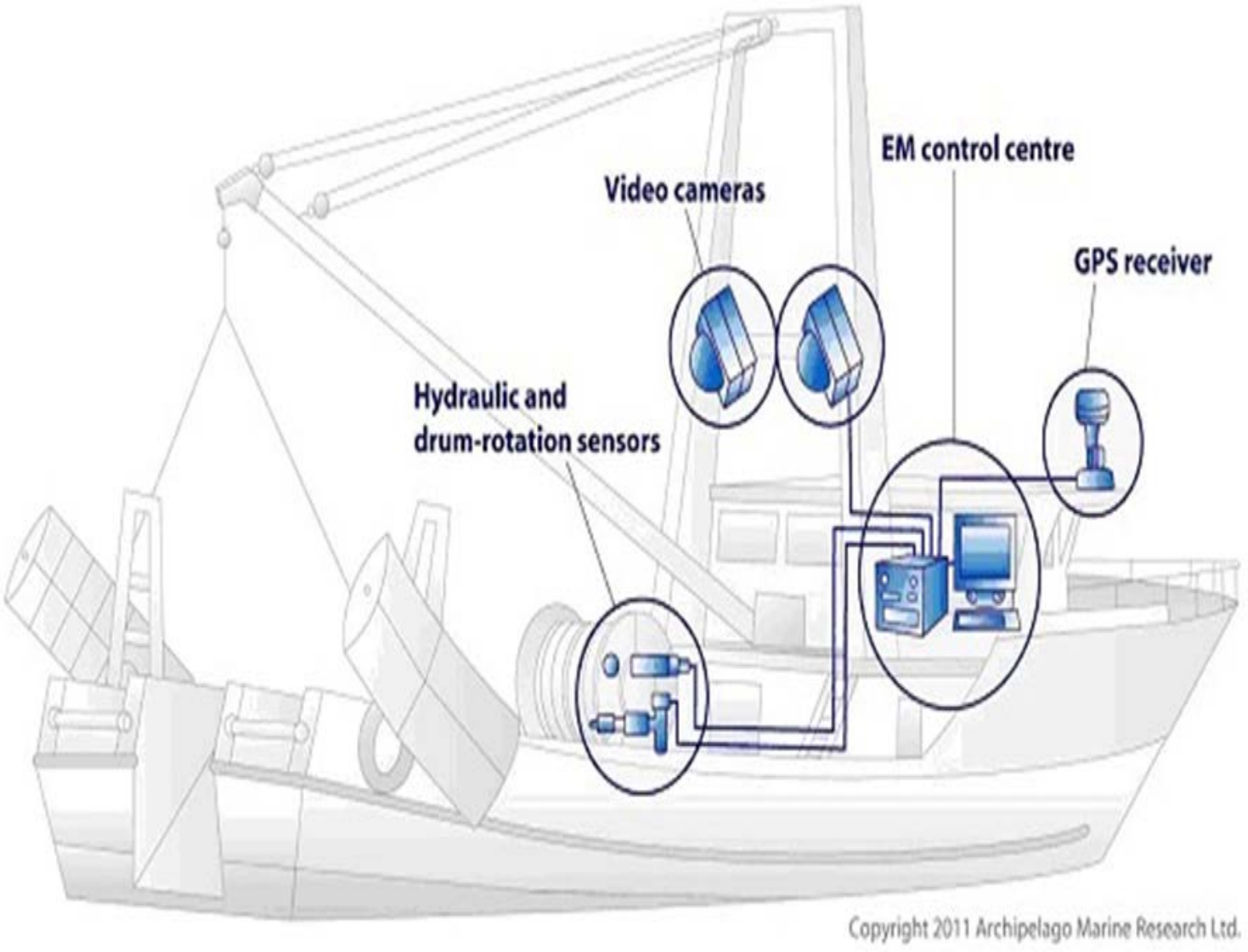


Global Positioning System

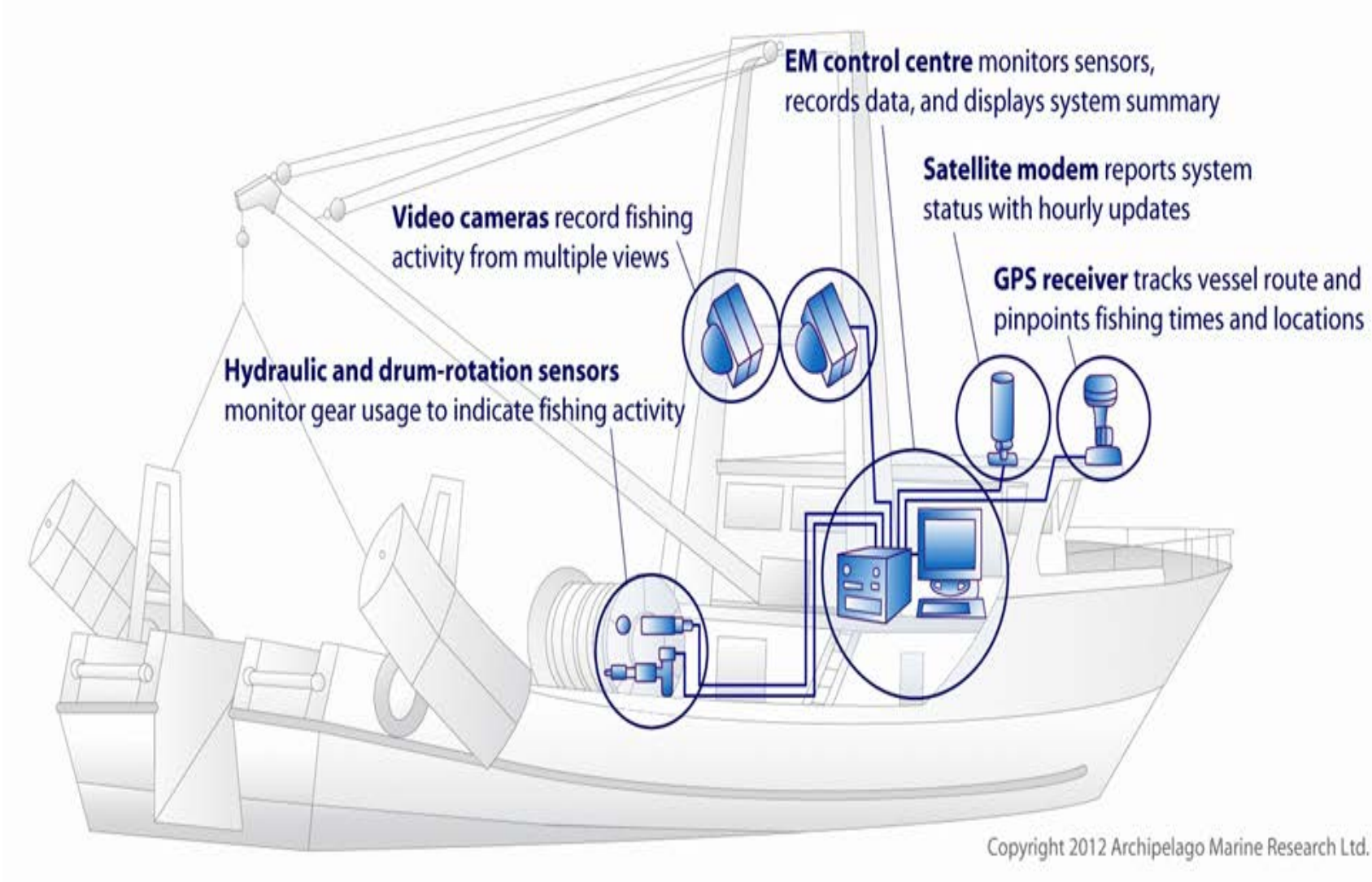
Rotation sensor on trawl winch

Control box equipped with hard drive

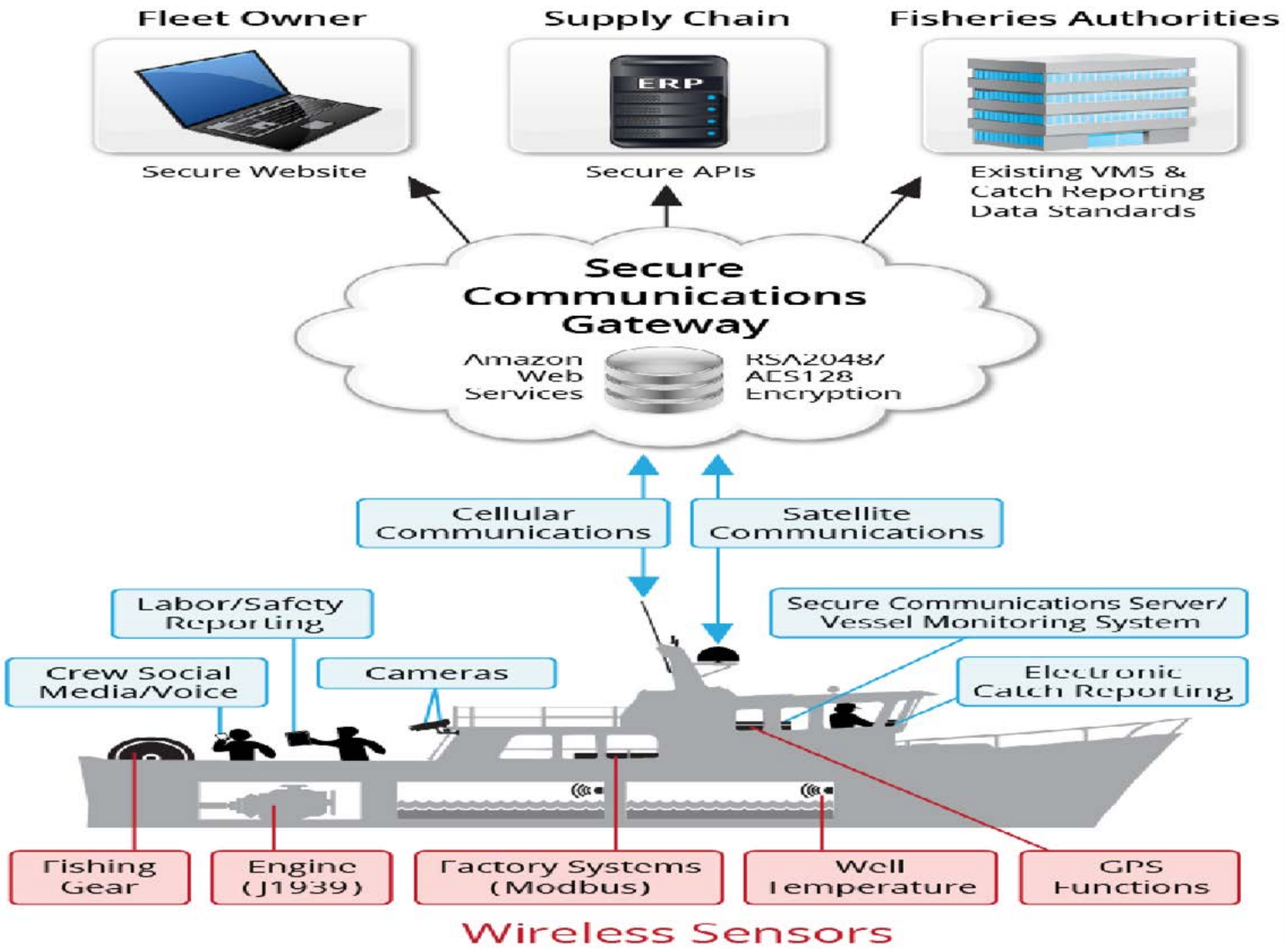
Closed System



Semi-Closed System



Open System


Fleet Owner
Supply Chain
Fisheries Authorities
ERP
Secure Website
Secure APIs
Existing VMS &
Catch Reporting
Data Standards
Secure
Communications
Gateway
Amazon
Web
Services
RSA2048/
AES128
Encryption
Cellular
Communications
Satellite
Communications
Labor/Safety
Reporting
Crew Social
Media/Voice
Cameras
Secure Communications Server/
Vessel Monitoring System
Electronic
Catch Reporting
Fishing
Gear
Engine
(J1939)
Factory Systems
(Modbus)
Well
Temperature
GPS
Functions
Wireless Sensors

Summary of Participation in Electronic Monitoring Programs - October 2017

		Fishery	# EM Vessels	# Vessels in Fishery	Obs Coverage	EM Coverage	% Video Reviewed	Implement Type/Date	Funding	Purpose of EM	Comments
1	AK	Bering Sea and Aleutian Island (BSAI) Non-Pollock Trawl Catcher/Processor (C/P)	67	70	100%	100%	As requested NMFS/OLE	Regs- 2007	Industry	Compliance monitoring combined with observers	Each program was implemented with specific compliance monitoring goals. In 2014, NMFS revised regulations related to at-sea motion compensated flow scales affecting all of the boats in these programs.
2	AK	Bering Sea Pollock trawl Catcher/Processors and motherships			100%	100%	As requested NMFS/OLE	Regs-2011	Industry	Compliance monitoring combined with observers	
3	AK	Central Gulf of Alaska Rockfish Trawl C/P			100%	100%	As requested NMFS/OLE	Regs-2012	Industry	Compliance monitoring combined with observers	
4	AK	BSAI Pacific Cod Longline C/P			100%	100%	As requested NMFS/OLE	Regs-2013	Industry	Compliance monitoring combined with observers	
5	AK	Small boat longline	65	523	30%	30%	100%	Regs - 2018	NMFS & NFWF-2018 Indsutry-2019	Catch accounting	Participation expanding in 2018
6	AK	Small boat pot	18	109	30%	30%	100%				Participation expanding in 2018
7	WC	Whiting mid-water trawl	25	25	100%	100%	100%	EFP-2018	NMFS	Slippage requirements	
8	WC	Non-whiting mid-water trawl	6	?	100%	100%	100%	EFP-2018	NMFS	Catch accounting	
9	WC	Fixed gear IFQ	7	18	100%	100%	100%	EFP-2018	NMFS	Catch accounting	
10	WC	Groundfish bottom trawl	11	60	100%	100%	100%	EFP-2018	NMFS	Catch accounting	
11	NE	Groundfish sectors	6	230	16%	16%	100%	EFP-2019	NFWF	Catch accounting	Max retention project in fall 2017
			8	230	16%	100%	100%	EFP-2019	NFWF	Catch accounting	
12	NE	Mid-water trawl	11	12	?	100%	100%	None-2019	NMFS	Slippage requirements	
13	HMS	Pelagic longline	112	135	*12%	100%	**12%-28% of trips	Regs-2015	NMFS	Audit of bluefin tuna reporting	*Observer coverage for protected species **Stratified random review of sets

Applications of Electronic Monitoring

- **Scientific data collection -** support stock assessments, bycatch reporting, ecosystem research
- **Management** – real-time management (individual vessel quotas, catch limits), auditing catch reporting
- **Compliance monitoring** – verify catch retention, access to closed areas, increased accountability
- **Additional Uses**
  - sustainability certifications
  - improved traceability
  - value-added products
  - data monetization

Electronic Monitoring Hurdles

- **Onboard vessel –** species identification, weight estimation
- **Costs & logistics** – video transmission (e.g., hard drives), archiving data, video review challenges
  - Remote data transmission
  - Automation of image processing
  - Annotation of images
- **Regulatory** – Changing technologies, enforcement
- **Analytical** – New data type, developing auditing standards
- **Current EM policy development**
  - Cost allocation
  - Video retention requirements
  - Confidentiality
  - Minimum participation

Electronic Technology Resources

- National EM and ER Website

  https://www.st.nmfs.noaa.gov/advanced-technology/electronic-monitoring/index

- FIS Program Website

  https://www.st.nmfs.noaa.gov/data/fis/products/project-list

- EM Information.com

  http://eminformation.com/

Thank You!
Questions?

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