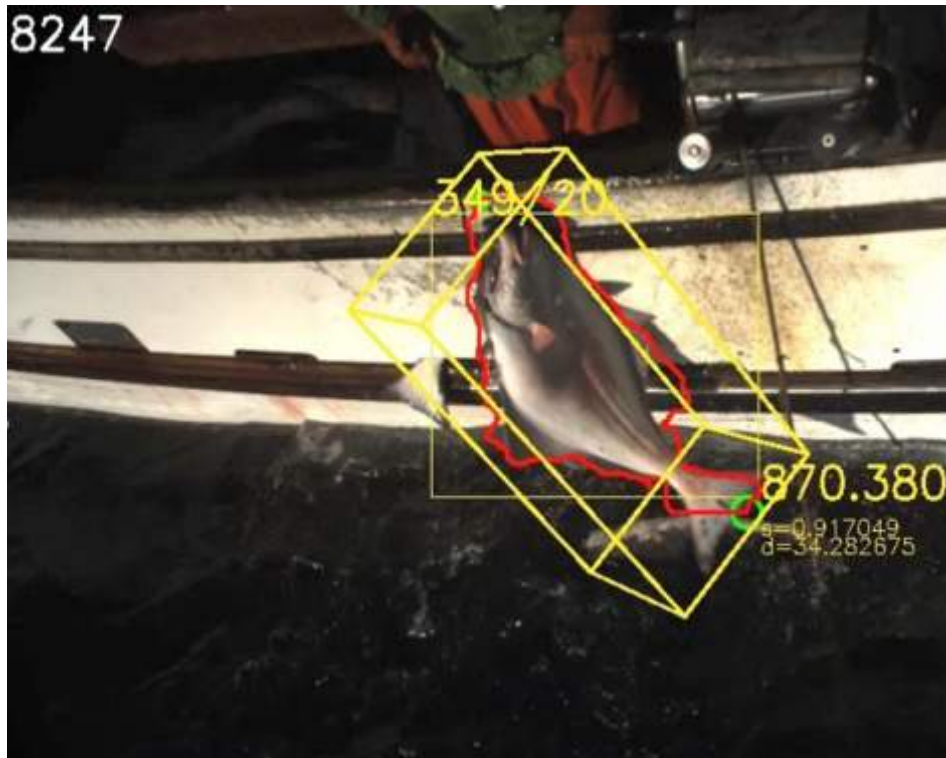


Overview of Electronic Technologies in U.S Fisheries



NOAA
FISHERIES



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Seafood and Fisheries
Emerging Technologies Conference

Electronic Technologies in U.S Fisheries

- Vessel monitoring systems (VMS)
- Observer technologies
- Electronic reporting (ER)
- Electronic monitoring (EM)
- Progress in 2019
- In the year 2024.....



U.S VMS Program

Program Basics

- > 4,000 vessels
- Satellite-based communications
- Operates all the time, in real-time
- Location, hail in/out, catch reporting
- Data confidentiality requirements

How it is used

- Monitoring closed areas and transiting
- Effort and quota monitoring
- Validating other data sources
- Port arrivals for sampling programs



U.S. Observer Programs



[illegible]

Species	Species Composition Measurements and Calculations
APD. HAW. SWAMP	$\frac{231 \text{ down} + 238 \text{ HK} + 245 \text{ HK} + 241 \text{ HK} + 237 \text{ HK} + 247 \text{ HK}}{6}$ $\text{Avg HK} = (240 \text{ HK}) \left(\frac{17.8}{\text{COUNTS}} \right) = 4080 \text{ } \frac{1}{\text{HAWK SAMPLE}}$
SAGE AVG WT.	$\frac{490 \text{ } \frac{132.40 \text{ LBS}}{\text{LBS}}}{\text{LBS}} = \left(\frac{2.21}{\text{LBS}} \right) \left(\frac{238 \text{ BOWLING}}{\text{FISH}} \right)$ $= 1118.78 \text{ LBS REPAIR}$
SAGE DROP	$\left(\frac{132.40 \text{ LBS}}{490 \text{ LBS}} \right) \left(\frac{1}{\text{COUNTS}} \right) = 9.93 \text{ LBS}$ $\left(\frac{132.40 \text{ LBS}}{490 \text{ LBS}} \right) \left(\frac{1}{\text{COUNTS}} \right) = 9.93 \text{ LBS}$ $\left(\frac{132.40 \text{ LBS}}{490 \text{ LBS}} \right) \left(\frac{1}{\text{COUNTS}} \right) = 9.93 \text{ LBS}$
SHORELINE THICKET "SS"	$\left(\frac{17.05 \text{ LBS}}{6} \right) \left(\frac{1}{\text{COUNTS}} \right) = 180.925$ $\left(\frac{17.05 \text{ LBS}}{6} \right) \left(\frac{1}{\text{COUNTS}} \right) = 180.925$ $\left(\frac{17.05 \text{ LBS}}{6} \right) \left(\frac{1}{\text{COUNTS}} \right) = 180.925$
LONGSAND "LS"	$\left(\frac{3.05 \text{ LBS}}{9} \right) \left(\frac{1}{\text{COUNTS}} \right) = .4277$ $\left(\frac{3.05 \text{ LBS}}{9} \right) \left(\frac{1}{\text{COUNTS}} \right) = .4277$ $\left(\frac{3.05 \text{ LBS}}{9} \right) \left(\frac{1}{\text{COUNTS}} \right) = .4277$
FIVE EAT STAKE	$\left(\frac{9.00 \text{ LBS}}{8} \right) \left(\frac{1}{\text{COUNTS}} \right) = 1.125 \text{ LBS}$ $\left(\frac{9.00 \text{ LBS}}{8} \right) \left(\frac{1}{\text{COUNTS}} \right) = 1.125 \text{ LBS}$ $\left(\frac{9.00 \text{ LBS}}{8} \right) \left(\frac{1}{\text{COUNTS}} \right) = 1.125 \text{ LBS}$
Σ FILE CAL	$= 90 + 1.125 = 10.125 \text{ LBS}$ $= 10.13 \text{ LBS}$

[illegible]

Observer Technologies in U.S Fisheries

Existing Technologies

- Efficient, timely, and legible
- Customization and adaptation
- Auto-calculation and sync to databases
- Front-end error checks and validation



Future Development

- Barcoding and GPS integration
- Application-driven sampling
- Bluetooth with scales
- Species ID and image collection



Electronic Reporting in U.S. Fisheries

Commercial and For-Hire Fisheries

- Vessels, processors, and dealers
- Long history of paper programs
- Different requirements and participation
 - NE ~200 (out of 2,100) all commercial vessels
 - SE ~500 (out of 840) Gulf of Mexico snapper/grouper
 - PI ~10 (out of 165) Hawaii deep-set longline

Challenges

- Data housing
- Minimum standards (multi-governance)
- Design and data elements
- Compliance and enforcement



The image shows a 'FISHING VESSEL TRIP REPORT' form. It includes sections for vessel information (name, number, state), trip details (date, time, location), and a large table for recording catch data by species and gear type. The form is titled 'FISHING VESSEL TRIP REPORT' and has a NOAA logo in the top right corner.



AK-eLandings



NE-Fish Online

The map illustrates the distribution of recreational fisheries management programs across the United States. The programs are categorized by region and color-coded:

- Alaska (Green):**
 - Statewide Saltwater Harvest Logbook Program
 - Ocean Sampling Program
 - Puget Sound Sampling Program
- Pacific Northwest (Blue):**
 - Pacific RecFIN
 - Ocean Recreational Boat Survey
 - Shore and Estuary Boat Survey
 - California Recreational Fisheries Surveys
- Northeast (Orange):**
 - Large Pelagic Survey
 - NE Vessel Trip Reporting Program
- Southeast (Yellow):**
 - TPWD Angler Survey
 - LA Creel
 - SE Headboat Survey
- Gulf of Mexico (Light Blue):**
 - AP AIS/FES
- Hawaiian Islands (Purple):**
 - HI MRIP/FES
- Caribbean (Light Green):**
 - WPacFIN
- Legend:**
 - Blue circle: AP AIS/FES
 - White circle: None

ER in Recreational Fisheries



Data **must** be validated.



Anglers **must** participate.



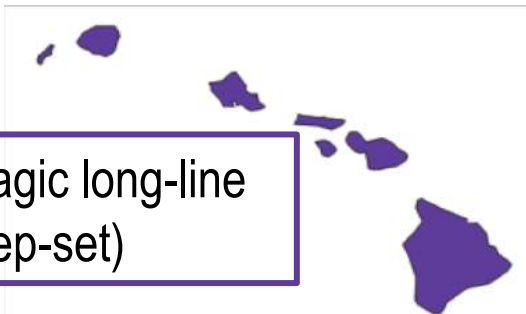
Participants must report **all catch** from **all trips**.

Electronic monitoring in the United States



- Non-Pollock trawl
- Pollock trawl
- Rockfish trawl
- Pacific cod longline
- Small boat fixed gear

- Whiting mid-water trawl
- Non-whiting mid-water trawl
- Fixed-gear
- Groundfish bottom trawl



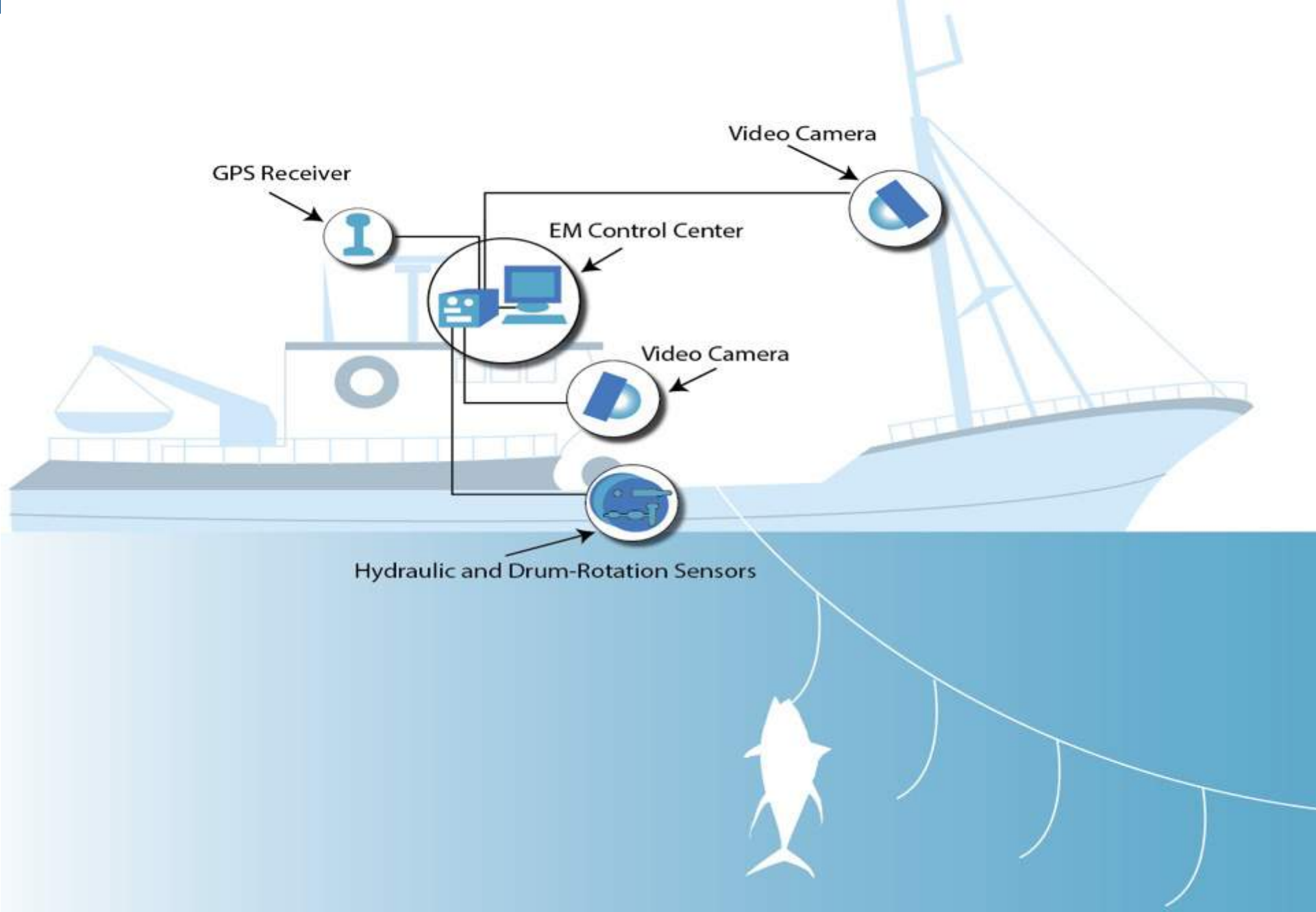
- Pelagic long-line (deep-set)

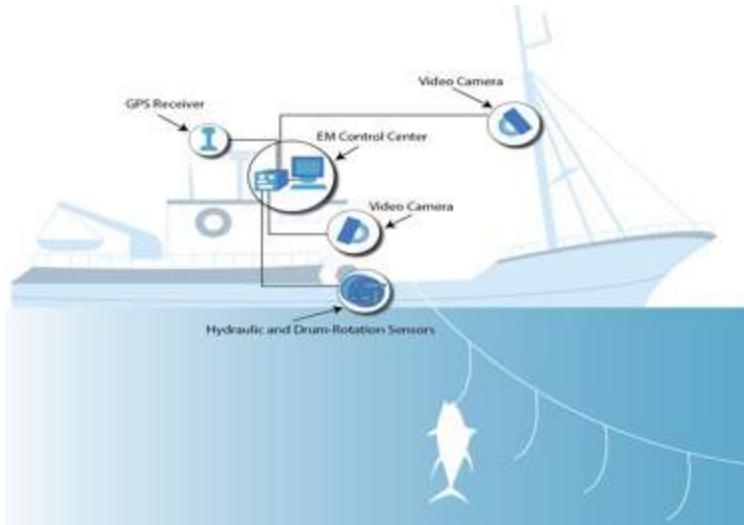


- Pilot stage*

- Groundfish
- Mid-water trawl

- Atlantic Highly Migratory Species**
- Pelagic longline





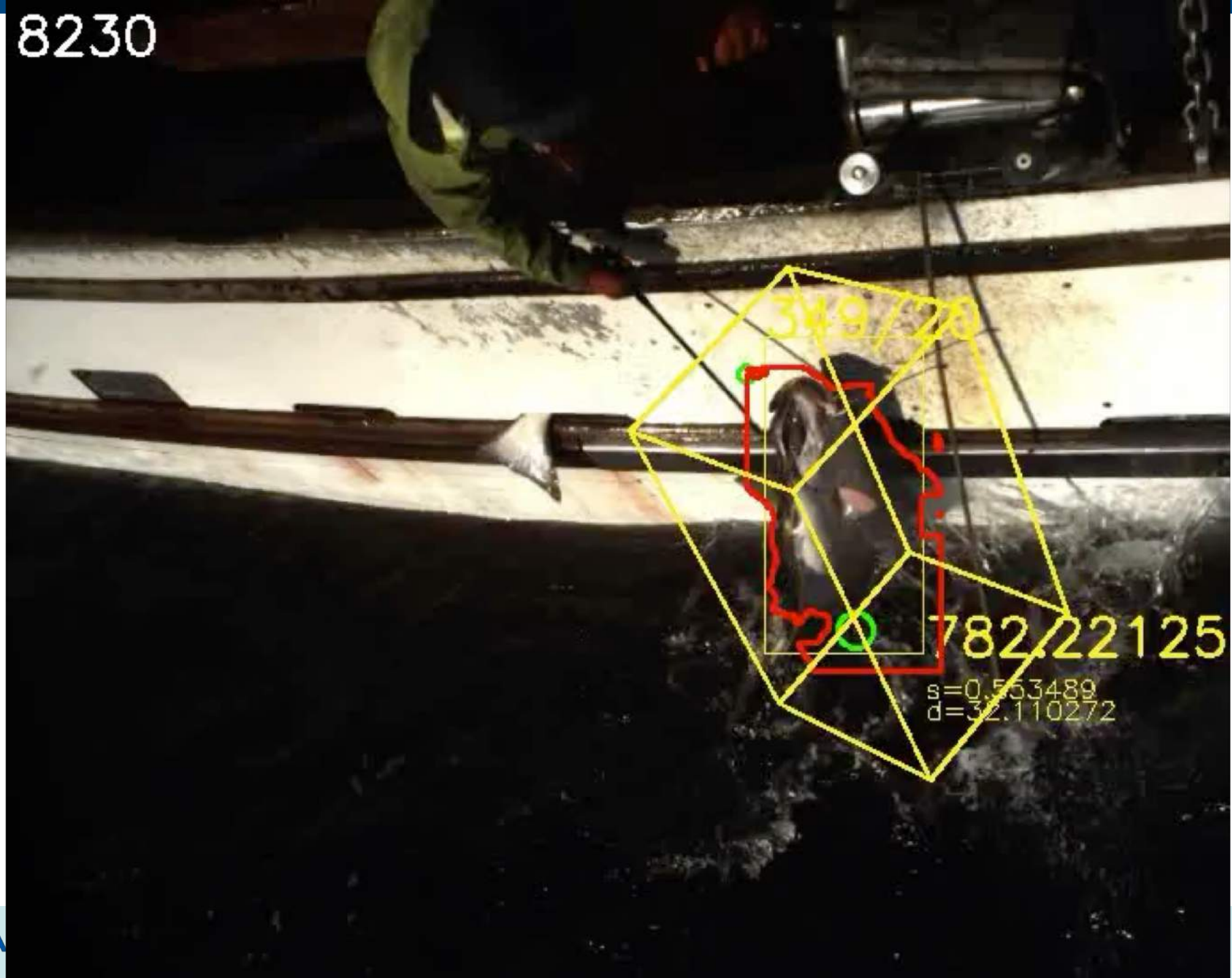
Data
submitted
to NMFS

Cam 1





8230

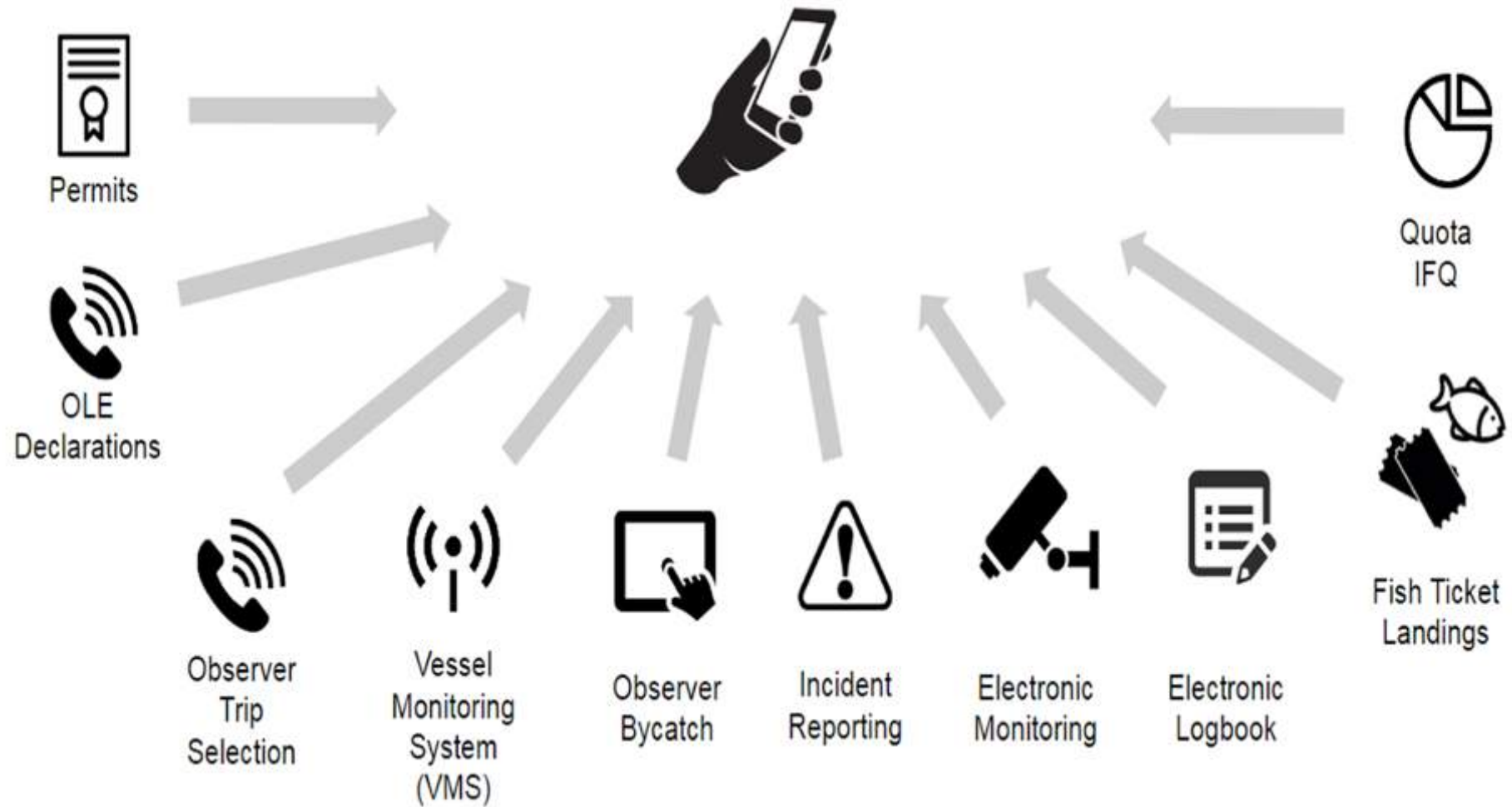


Electronic Technologies Progress in 2019

- EM Policy Development
 - Cost allocation framework
 - Video storage and retention requirements
 - Data access and ownership
 - Program standards and best practices
- National Fish Image Library
 - Make imagery available to public
 - Build on Video & Image Analytics for Marine Environment (VIAME)
- Opportunities for Collaboration
 - International Council for the Exploration of the Sea (ICES)
 - 3-year working group on Technology Integration for Fisheries-Dependent Data
 - American Fisheries Society - Fishery-Dependent Observing & Monitoring
 - 3rd National EM Workshop
- 2019 Regional Implementation Plans
 - 5-year plan for developing and implementing ETs



In the year 2024.....



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Thank you!

