



Electronic Monitoring (EM) Study

Documenting and Estimating Catch on Commercial Fishing Vessels Using EM Technology

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Study Purpose

Electronic Monitoring (EM) technologies hold promise as data collection sources and could be used as a monitoring tool in conjunction with other data collection methods if proven to collect the type and quality data needed to monitor catch accurately. EM technology includes the use of passive electronic systems (automated computers, cameras, sensors, etc.) to monitor fishing events.

The Fisheries Sampling Branch (FSB) is conducting a multi-year study with Archipelago Marine Research, Ltd., to investigate the utility of EM to monitor catch for allocation purposes in the Northeast multispecies fishery. Results will define the role of EM in sector fisheries.

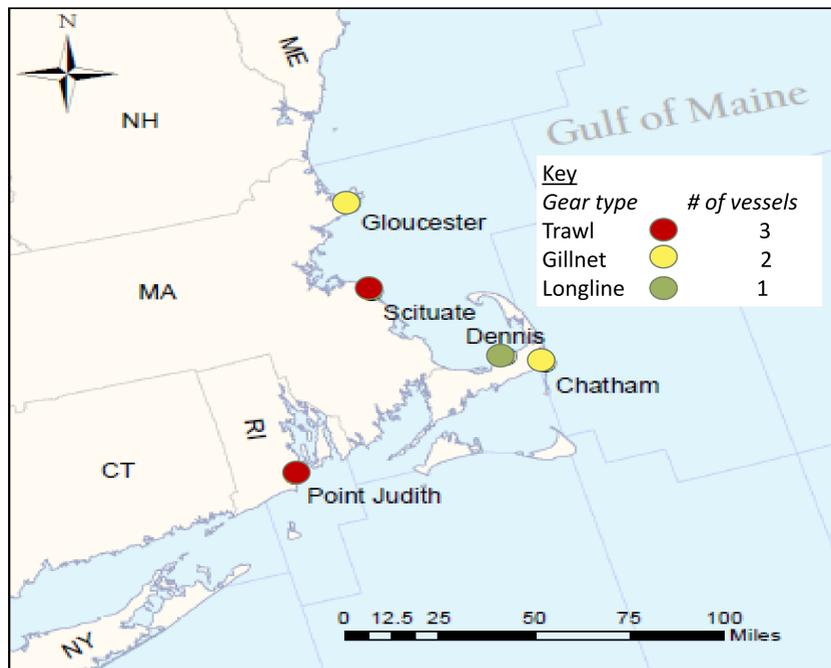
Study Phase Summary and Results

The first phase of the program focused on building a foundation of data (detection, counting, species identification) specific to the needs of the northeast multispecies fishery. Results demonstrated there were some limitations in regard to consistent and reliable species identification and difficulties obtaining a weight estimate.

The second phase focused on a series of dedicated experiments to improve methods for obtaining fish weight with a known accuracy and precision and to develop methods to increase species identification through catch handling. Efficiencies were found in estimated weights through length/weight correlations and the method will be further explored in Phase III.

Phase III will focus on developing and testing on-board methodologies (e.g., catch handling) to simulate an operational EM program with study participants. Expected results include identifying all the necessary components to support an EM program and finding strategies to increase alignment between EM and industry-reported data.

EM Study Ports and Participating Gear Types



Study Phase Goals

Phase I – Initial Data Collection

- Test utility of EM to successfully collect time and fishing location information (detect fishing event, distinguish hauls, create vessel track)
- Test ability of EM to collect catch information (record catch hauling and sorting) and species identification

Phase II – Estimating Catch and Effective Species Identification

Length-Weight Regressions

- Comparison of EM to observer fish lengths
- Comparison of derived weights
- Comparison of fish length between EM reviewers

Volume Estimation

- Utilizing containers of known volume to estimate weight

Species Identification

- Categorizing features of discarded groundfish that are identifiable and distinguishable to EM reviewers
- Verify if species identification is consistent between two independent reviewers

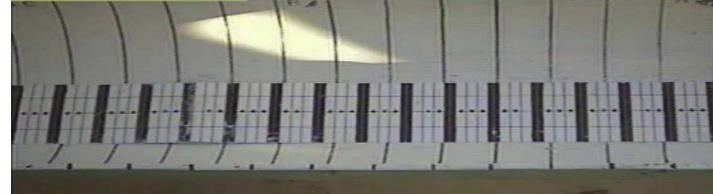
Species ID experiment



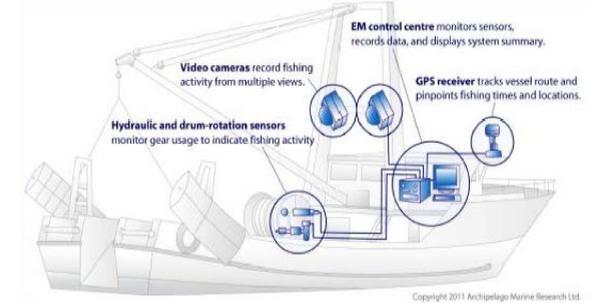
Volume estimation experiment



Length-weight experiment



EM System Components



- Control box and user interface
- Cameras (digital or analog)
- GPS receiver
- Hydraulic pressure transducer and drum rotation sensors
- Control box for hard drive storage
- System does not record audio

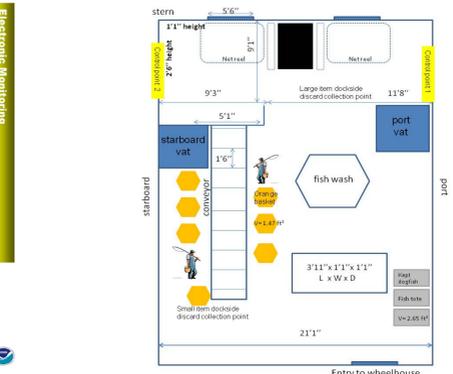
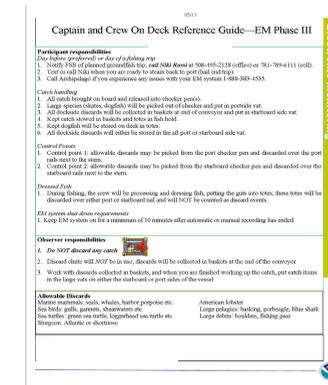
EM Vessel Monitoring Plan Excerpts

FISHERMEN'S COMMENT LOG NMFS FISHERIES OBSERVER PROGRAM 05/01/13

HAUL NUMBER	HAUL START DATE	HAUL START TIME (24 hours)	HAUL START LAT	HAUL START LONG	HAUL END DATE	HAUL END TIME (24 hours)	HAUL END LAT	HAUL END LONG
1	05/10/13	1300	4218.4	6731.6	05/10/13	1330	4218.6	6731.4
SPECIES	COUNT	WEIGHT (LBS)	ESTIMATION METHOD (VISUAL, ACTUAL, TALLY, OTHER)	SPECIES	COUNT	WEIGHT (LBS)	ESTIMATION METHOD (VISUAL, ACTUAL, TALLY, OTHER)	COMMENTS
WHITE HAKE	3	6	visual	WINTER FLOUNDER (BLACKBACK)				
POLLOCK	2	8	tally	YELLOWTAIL FLOUNDER				
ATLANTIC COD				WITCH FLOUNDER	1	1	visual	
HADDOCK				AM. PLAICE FLOUNDER (DAB)				
OCEAN POUT	5	5	visual	SAND DAB FLOUNDER (WINDOWPANE)				
REDFISH				ATLANTIC HALIBUT				
ATLANTIC WOLFFISH								

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Sample log for audit vessels. Captains record haul information (location, time, date) and record all discarded catch (species and an estimated weight) per haul



Phase III – Application of On-Board Methodologies

- Six vessels (3 mobile-gear, 3 fixed-gear) will test two EM monitoring models during this phase (May – September 2013);
 - Full retention of catch with EM monitoring for compliance
 - EM validation of industry-reported data (audit)

Monitoring Approach I – Full Retention

- EM is used to monitor discard compliance
- All catch retained and landed
- If discarding is necessary at sea for safety reasons captains must record the event (estimated weight by species)
- Requires a dockside monitoring (DSM) component

Monitoring Approach II – Audit

- Captain and crew record count and/or weight for discarded allocated species for each haul during a trip
- Discard catch at specific locations only (e.g., control points)
- EM verifies industry-reported data by comparing captain logs to EM reviewer records

A reference guide and deck diagram are provided to all participating vessels to aid and orient the captain and crew in catch handling.