



# Electronic Monitoring Project in the Northeastern United States

Amy Martins<sup>1</sup>, Nichole Rossi<sup>1</sup>, Kelly Neville<sup>2</sup>, Glenn Chamberlain<sup>2</sup>  
National Marine Fisheries Service, Northeast Fisheries Science Center, Fisheries Sampling Branch, Woods Hole, MA, U.S.A. (1)  
Integrated Statistics, Woods Hole, MA, U.S.A. (2)

## STUDY PURPOSE

Electronic Monitoring (EM) technologies are valuable data collection tools that could be used to monitor catch if proven to effectively collect the appropriate type and quality of data. When supplemented by other traditional data collection methods, EM may be a way to support full catch accounting. EM technology uses a combination of passive electronic systems (automated computers, video cameras, sensors) to monitor fishing events and capture supporting catch handling practices.

The Northeast Fisheries Science Center (NEFSC) conducted a multi-year study with Archipelago Marine Research (AMR), Ltd., to investigate the utility of EM at monitoring bycatch for catch accounting in the Northeast Multispecies Fishery. Results from this study will determine how to best incorporate EM and further define the role of EM in the Northeast.

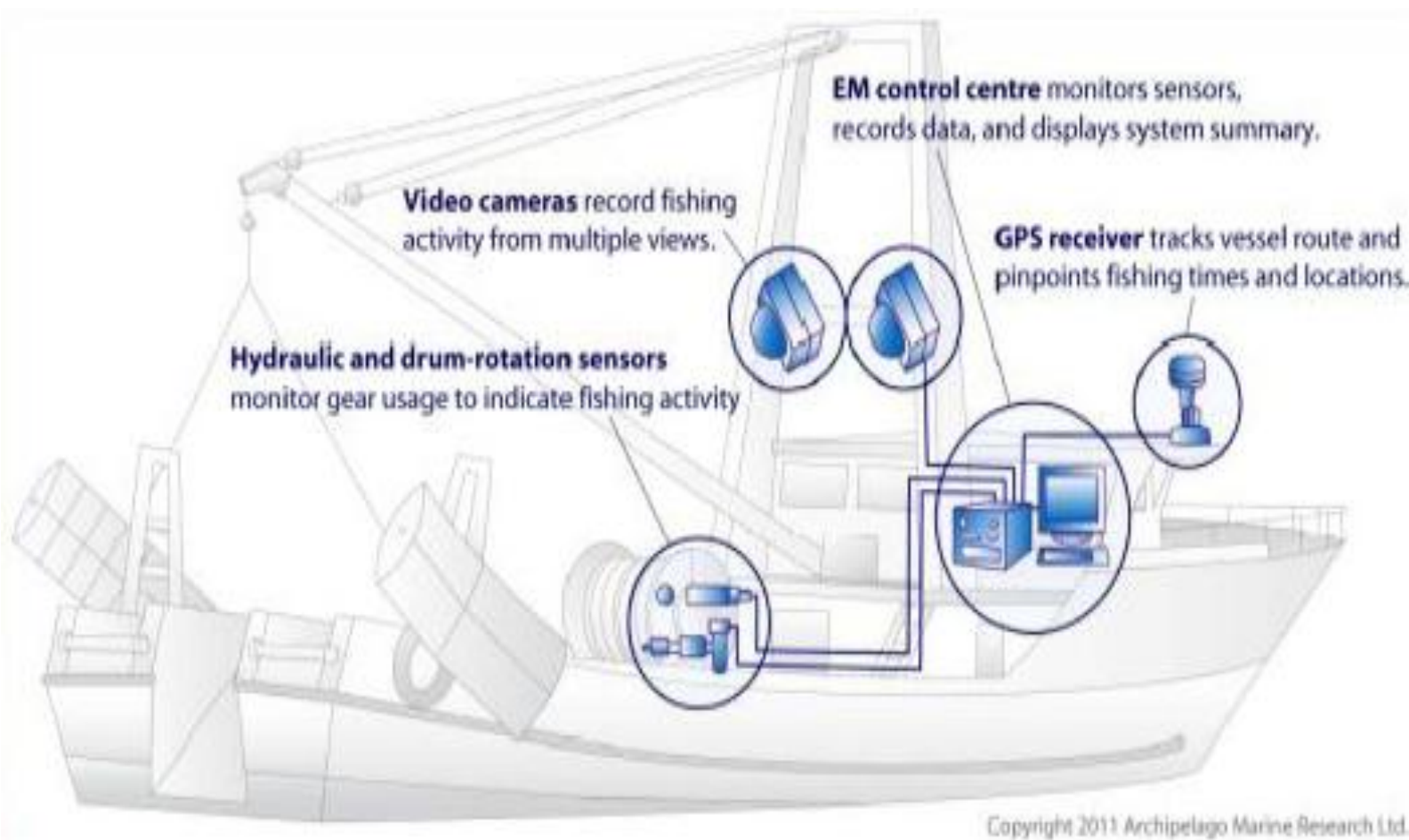
## STUDY PHASE SUMMARIES AND RESULTS

Phase I of the study focused on identifying baseline data (detection of fishing events, counting fish, species identification) required to monitor catch in the Northeast Multispecies Fishery. It was difficult to obtain consistent and reliable species identification (for certain species) and weight estimates.

Phase II 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 improve species identification through catch handling. Weight was effectively estimated using length/weight correlations and improvement in species identification was improved for select species.

Phase III focused on developing and testing on-board methodologies (e.g., catch handling) to simulate an operational EM program with study participants. Information gathered from phase III will be summarized in a series of reports and will include information collected throughout the entire project (March 2010 – 2014). Reports will include a summary report of data collected during phase III, a report on EM options most applicable for the Northeast and cost drivers associated with operational programs, and a narrative of operational components necessary to support an independent EM monitoring program.

## ELECTRONIC MONITORING SYSTEM COMPONENTS



- Control box and user interface
- Cameras (digital or analog)
- GPS receiver
- Hydraulic pressure transducer sensor
- Drum rotation sensor
- Control box for hard drive storage



## STUDY PHASE OBJECTIVES

### Phase I – Initial Data Collection

- Evaluated the ability of EM to successfully collect time and fishing location information (detect fishing event, distinguish hauls, create vessel track)
- Evaluated the ability of EM to collect catch information (capture catch hauling and fish processing) and identify species effectively
- Evaluated the ability of EM to distinguish between kept and discarded catch
- Verified all discarding occurred within camera view

### Phase II – Estimating Catch Weight and Effective Species Identification

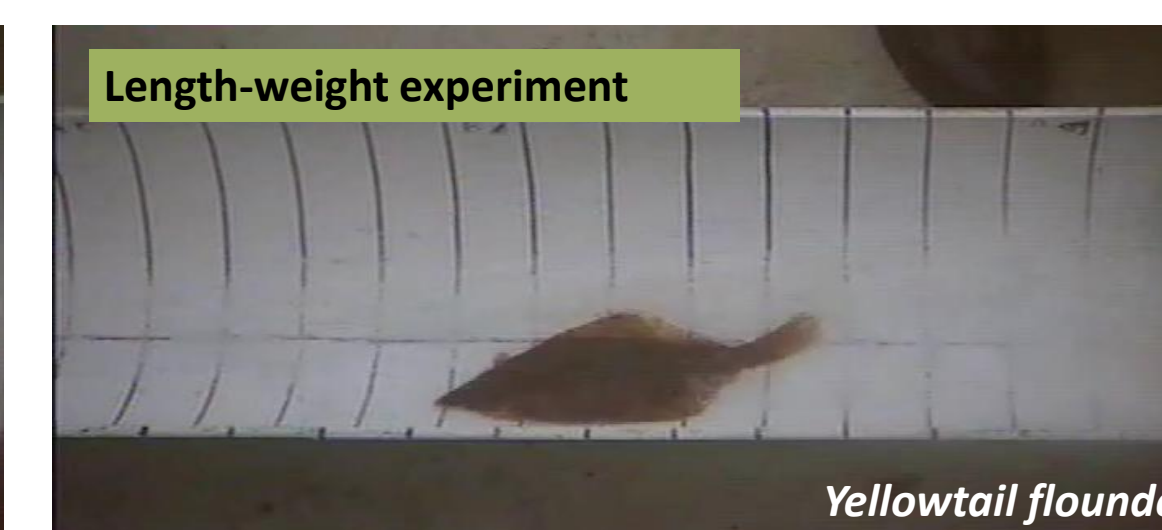
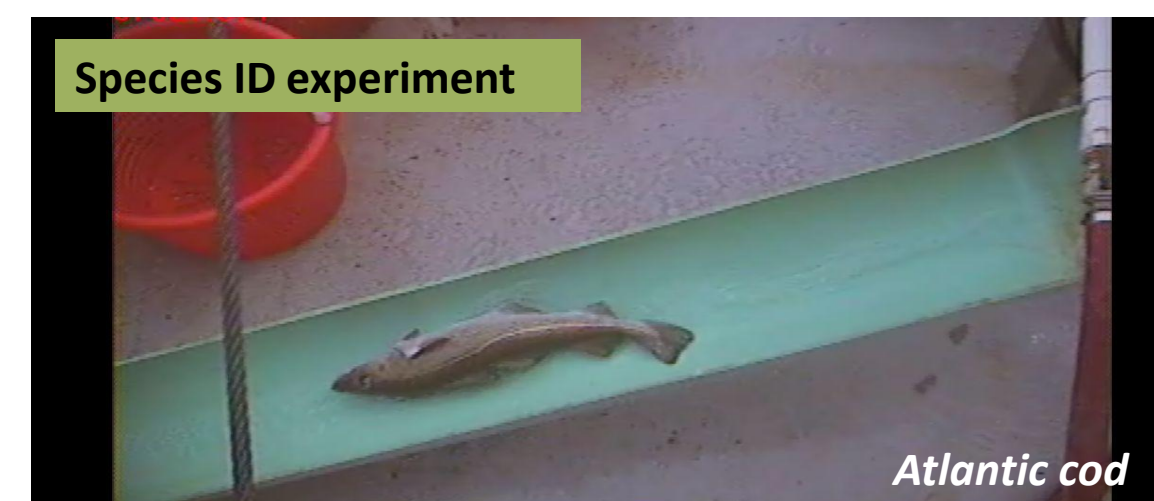
- Weight Estimation**
- Compared EM-derived length measurements to observed lengths
  - Compared derived fish length among EM reviewers (standardization)
  - Compared EM-derived weight estimates (obtained through length/weight regressions) to observed weights

### Volume Estimation

- Evaluated the use of fish totes/baskets of known volume to estimate weight
- Compared EM-derived volume estimates to observed volumes

### Species Identification

- Categorized identifiable features of discarded groundfish
- Verified consistent species identification among EM reviewers



### Phase III – Application of On-Board Methodologies

Four vessels tested two EM models identified by NEFSC as potential monitoring approaches in the Northeast:

- Maximized retention of catch with EM for no-discard compliance
- EM validation of industry-reported data (discard audit)

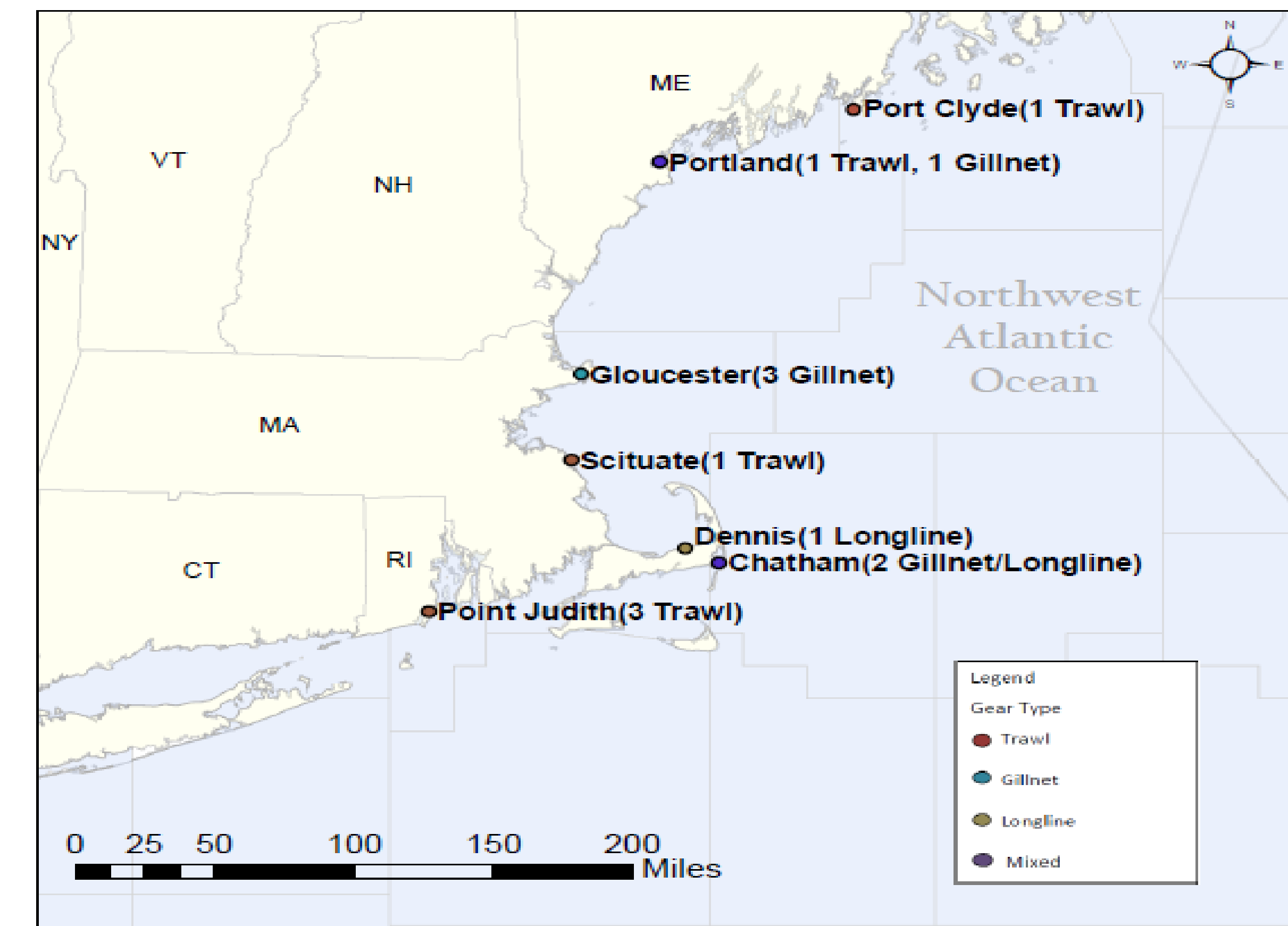
#### Monitoring Approach I – Maximized Retention

- All catch retained with the exception of “allowable discards” (e.g., large pelagics, marine mammals, turtles, birds, debris, etc.)
- Any necessary discarding at sea for safety reasons was recorded by the captain (estimated weight by species) and verified with EM data
- Docksider monitoring required to estimate and identify catch landed and to dispose of unmarketable catch

#### Monitoring Approach II – Discard Audit

- Captain recorded count and/or weight of discarded allocated species for each haul during a trip
- Catch was discarded at strategic locations (e.g., control points) to ensure all discarding was within camera view and was discarded one fish at a time for subsequent reviewer annotation.
- EM used to verify industry-reported data by comparing captain logs to EM reviewer records

## ELECTRONIC MONITORING STUDY PARTICIPANTS



## PHASE III SUMMARY REPORTS

The NEFSC has acquired considerable knowledge on the strengths and challenges of EM, operational components to support an EM program, promising monitoring approaches, and baseline EM system requirements. A series of reports summarizing data collected during phase III and incorporating data gathered throughout the duration of the project will be released in the spring of 2014. The reports will focus on major topics of interest, including;

### Phase III Technical Report

Summary of data collected, video and sensor data quality, interpretation and analysis methods, docksider monitoring data summary, data alignment between industry and EM data, and an inventory of catch.

### EM Options Report

Examination of EM models tested, procedural and logistical considerations involved with various EM options, description of problematic concerns and possible solution strategies, identification of cost drivers relative to an EM program, “best practices” or efficiencies identified throughout testing, and suitable EM options for the Northeast.

### Sector EM Operational Guide

Descriptive narrative of the operational components (docksider monitoring, equipment services and maintenance, compliance measures, data retrievals, etc.) necessary to support an EM program.

## ACKNOWLEDGEMENTS

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