

Implementation of the Integrated Sentinel Monitoring Network (ISMN)

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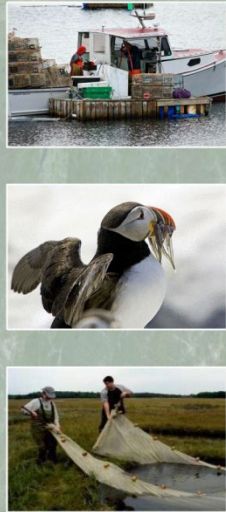
What is the ISMN?

- A joint project of NERACOOS and NROC
- Based at NERACOOS, a nascent regional infrastructure to facilitate observation and interpretation of change in Northeast region ecosystems
- Represents a broad consensus of scientists and managers recognizing that present monitoring activities are fragmented and moreover leave important gaps in coverage of key ecosystem properties.

- Joint Ocean and Coastal Ecosystems Health Committee formed in 2012
- White paper for IOOS: “Integrated Sentinel Monitoring for the Northeast Region: Gap Assessment” (2012)
- 16 member Steering Committee convenes a series of open regional workshops between June 2013 and June 2015
- Result is the ISMN Science and Implementation (2016)
- NERACOOS/NROC receive funding to initiate implementation (2018)

ISMN History

Integrated Sentinel Monitoring Network for Change in Northeast U.S. Ocean and Coastal Ecosystems
Science and Implementation Plan: Ed. 1



ABSTRACT
The Northeast U.S. region spans a range of ocean and coastal environments from Long Island Sound to the Canadian border in the eastern Gulf of Maine, and includes ecologically and economically rich ecosystems. Climate change, living resource harvesting, and increasing human populations are altering the structure and function of these ecosystems. Ecosystem changes are not only threatening the sustainability of marine and human communities, but also challenging managers to make decisions about marine resources under novel conditions with high degrees of uncertainty. In response to these changes and challenges, this document describes a plan to sustain an adaptive sentinel monitoring program that leverages and enhances existing monitoring efforts to detect key changes, informs researchers, managers, and the public about ecosystem status and vulnerabilities; and supports an integrated, ecosystem-based management framework for adaptive responses to changes in ecosystem states.

A project of the joint Northeast Regional Ocean Council (NROC) and Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS) Ocean and Coastal Ecosystem Health Committee

[www.neracoos.org/
sentinelmonitoring](http://www.neracoos.org/sentinelmonitoring)

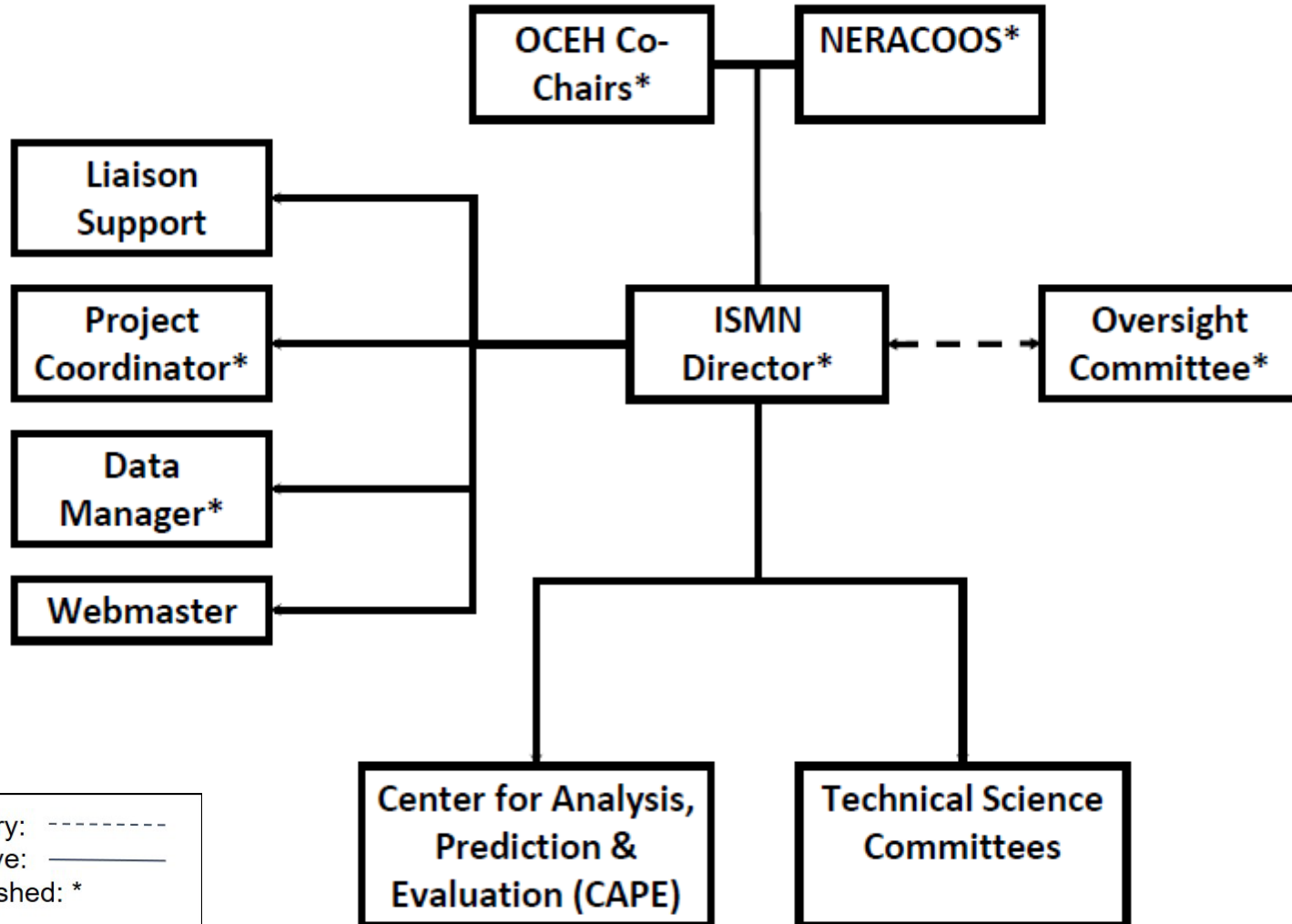
ISMN Functions

Regional facilitation of integrated, sustained observing across pelagic, benthic and nearshore and estuarine ecosystems

- Identifies observing activities and provides access to data sets
- Identifies and provides support to fill observing gaps
- Promotes standardization and quality assurance across observing activities
- Facilitates analysis and interpretation of ecosystem change across data sets
- Provides information to stakeholders and the broader community to inform ecosystem-based decision making

Regional Infrastructure to facilitate observing of change in NE regional ecosystems

ISMN Governance Schematic



The Oversight Committee

- Advises the ISMN Director on the implementation and integration of ISMN activities.
- Determines priorities for enhancement of present observing activities.
- Establishes and recruits participants in technical science committees to integrate and facilitate effectiveness of data collection, management, and analysis.
- Guides the ISMN Director in awarding grants for data synthesis through the Center for Analysis, Prediction and Evaluation (CAPE).

Center for Analysis Prediction & Evaluation (CAPE)

Engages regional experts in short-term activities:

- Enables integrated analysis across datasets
- Generates information products about the status of the Northeast region ecosystems
- Addresses identified needs for ecosystem-based information and skills for federal and state agencies and other stakeholders

Next steps for the ISMN

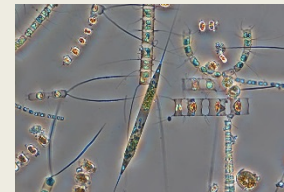
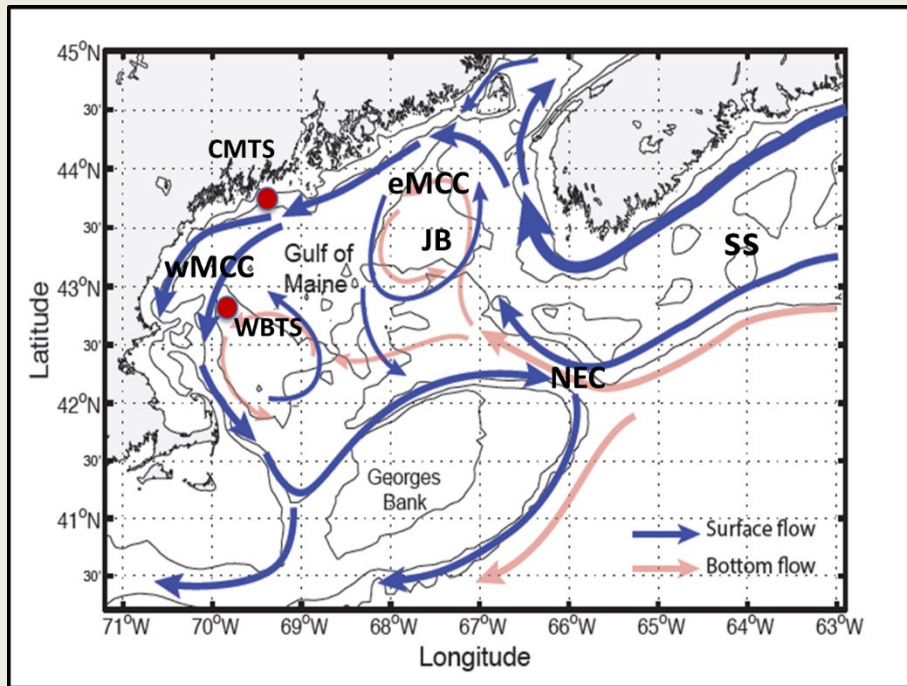
- Establish membership on the Oversight Committee
- MBON (Marine Biodiversity Observation Network)-ATN (Animal Tracking Network)- ISMN Workshop: May 6-7, 2019 Portsmouth
- Data management workshop: late summer/early fall
- CAPE governance and priorities
- Obtain funding for ISMN infrastructure and function

MBON expansion into the Gulf of Maine: the NERACOOS/NROC Integrated Sentinel Monitoring Network

- Proposal submitted to the National Oceanography Partnership Program (NOPP)
- Nationally, 5 proposals, requiring Regional Association endorsement, will be awarded
- Topic 2: Sustained observations of marine biodiversity for improved understanding of marine ecosystem responses to changing environmental conditions
- 900 K over 3 y

The ISMN- MBON Expansion proposal

- Time series
- CAPE: lipidscape and NARW
- Data management



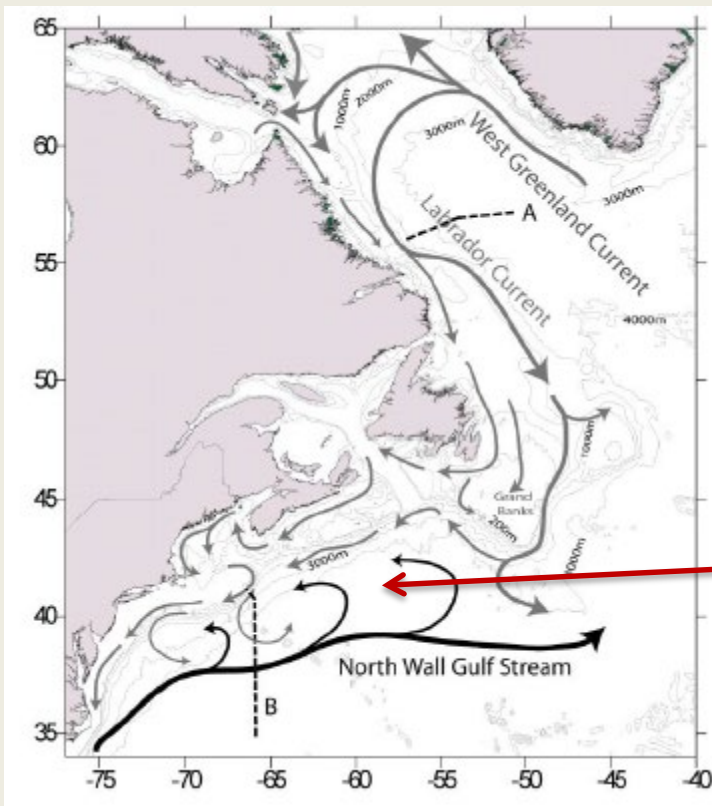
Calanus finmarchicus



Eubalaena glacialis

Change in supply to the eastern Gulf of Maine

1. From the Calanus-rich Scotian Shelf
2. From the Calanus-poor Atlantic slope water off the Northeast Channel



Recent evidence for a weakening of AMOC and northward shift of Gulf Stream (Ceasar et al. 2018: Nature 556:191)

North Atlantic
Temperate
Water

Data management

- Discovery
- Access
- Integration

Data management will be a vital component of the ISMN MBON project. GMRI's Ocean Data Products team is responsible for managing data collected through NERACOOS Data Management System (DMS). Once integrated into the DMS, the data will be accessible from the NERACOOS ERDDAP server through a variety of web services that will facilitate integration into the IOOS MBON Portal as well as integration into regional data products. The NERACOOS DMS and data access tools (e.g. ERDDAP) will be primary mechanism used to share data.

GMRI will lead the development of additional web tools and information products (e.g. ISMN project website) to provide project partners and other interested stakeholders to easily discover, access, browse, and interpret the data.