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# Northeast Coastal Indicators Workshop

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Workshop Report-out and Senior  
Management Panel Response

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# Welcome

## ■ Logistics

- ❑ Weather Report
  - ❑ Fun and interesting session
  - ❑ Special thanks to our panel members
  - ❑ Intent to adjourn by noon “unless ....”
  - ❑ Lunch on your own in the restaurant
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# Purpose of Morning Session

- Share the results of the technical sessions with all participants and look for cross-cutting ideas
  - Field-test the results with one portion of our indicators audience
  - Develop strategies to move the workshop results forward
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## Agenda – 8:00 a.m to 12:00 p.m.

- Six technical session reports (1 hour)
  - Panelist responses (1 hour)
  - Audience Question and Answer (30 minutes)
  - “Straw” Next Steps Proposal (5 minutes)
  - Panelist Recommendations on Implementation (40 minutes)
  - Audience Recommendations (30 minutes)
  - Wrap-up (15 minutes)
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# Technical Session Reports

## Indicator Topics

- Fisheries
- Contaminants
- Eutrophication
- Coastal Development
- Marine Aquatic Habitat
- Climate Change

## Morning Reporters

- David Dow
  - Wendy Leo
  - Suzanne Bricker
  - Rick D'Amico
  - Ralph Cantral
  - Mark Parker
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# Introductions

- Ellen Roy Herzfelder – Massachusetts
  - Byron James – New Brunswick
  - Priscilla Brooks – Conservation Law
  - Rick Spinrad – National Ocean Service
  - Betsy Wingfield – Connecticut
  - John Boreman – National Marine Fisheries
  - Faith Scattolon – Fisheries & Oceans
  - Katrina Kipp – Environmental Protection Agency
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# Northeast Coastal Indicators Workshop

## Breakout Session Results

January 8, 2004



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## Breakout Session Results

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- Fisheries
- Contaminants
- Eutrophication
- Aquatic Habitat
- Coastal Development
- Climate Change

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## Breakout Session Results

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### ■ Fisheries

- Contaminants
- Eutrophication
- Aquatic Habitat
- Coastal Development
- Climate Change

## Fisheries

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- Top Questions
  - **What is the health of the fisheries with regard to ecosystem integrity, including targeted and non-targeted species, habitat, and fisheries activities?**
    - 1) **What are the trends in characteristics and the status of exploited fisheries species?**
    - 2) **What are the effects of fishing on non-targeted species and their associated communities?**
    - 3) **What are the effects of fishing and non-fishing activities on marine habitat and fisheries productivity?**
    - 4) **What are the trends in the socioeconomic characteristics of fisheries?**



## Fisheries

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**What is the trends in and the status of exploited fisheries stocks?**

- Indicator(s):
  - Proportion of stocks at or above targeted abundance or biomass
  - Age/Size structure of species from surveys and/or landings
  - Spatial distribution of fisheries species
- Information Conveyed: **Status and trends for exploited fisheries stocks**
- Indicator Audience: **Fisheries managers, industry, public, other regulators, researchers**
- Spatial and Temporal Scales: **Range of species or stocks; Annual to every 3-5 years**

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5

## Fisheries

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**What are the effects of fishing on non-targeted species and their associated communities?**

- Indicator(s):
  - Characteristics of bycatch and discards
  - Population levels for selected species
  - Species Diversity
- Information Conveyed: **Impacts of fishing on non-targeted species and their associated communities**
- Indicator Audience: **Fisheries and environmental managers, industry, environmental interests, researchers, public**
- Spatial and Temporal Scales: **Regional based on populations or stock, biogeographic boundaries; Seasonal**

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6

## Fisheries

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**What are the effects of fishing and non-fishing activities on marine habitat and fisheries productivity?**

- Indicator(s):
  - Area closed to fishing, both pelagic and/or benthic
  - Benthic diversity
  - Spatial distribution of bottom fishing
- Information Conveyed: **Impacts of fishing and non-fishing activities on marine habitat and fisheries productivity**
- Indicator Audience: **Researchers, industry, public and environmental fisheries and habitat managers**
- Spatial and Temporal Scales: **Regionwide (based on biogeographic boundaries); 1 to 5 years depending on habitat to annually to continuous**

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7

## Fisheries

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**What are the trends in the socioeconomic characteristics of fishing?**

- Indicator(s):
  - Days at sea
  - Fleet composition
  - Commercial and recreational fishing economic value
  - Angler satisfaction
  - Overcapitalized fleets
  - Natural capital value
  - Market value for consumers
- Information Conveyed: **Are society's socioeconomic goals for fisheries being achieved?**
- Indicator Audience: **Researchers, community planners, fisheries managers, industry, public**

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8

## **Fisheries**

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- Key Partners Needed
  - US and Canadian Federal agencies
  - State and provincial agencies
  - NGOs
  - Academic Community (Depending upon the issue)
- Implementation Approaches
  - Survey existing data sources
  - Standardize methodologies
  - Coordinate among groups

## **Breakout Session Results**

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- Fisheries
- **Contaminants**
- Eutrophication
- Aquatic Habitat
- Coastal Development
- Climate Change

## Contaminants

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- Top Questions

- 1) How are contaminants in the region changing?
- 2) How is the input of contaminants changing over time and space?
- 3) Are management actions changing the extent and severity of human health effects?
- 4) How well are contaminant management actions protecting ecosystem integrity?

## Contaminants

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### How are contaminants in the region changing?

- Indicator(s):
  - Area of sediments that have contaminant levels above sediment quality guidelines
  - Level of contaminants in representative non-migratory organisms
  - Area of shellfish bed closure by state by year
  - Days of beach closure due to bacterial contamination by state by year
- Information Conveyed: **Where are contaminants; Where contaminants are going; Effectiveness of regulatory actions**
- Indicator Audience: **Public, regulators, legislators, educators**
- Spatial and Temporal Scales: **Specific water body scales; Event to Annual to Decadal**

## Contaminants

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How is the input of contaminants changing over time and space?

- Indicator(s):
  - Annual chemical load to water bodies by state
  - Number of bacterial source investigations and sources eliminated by year by state
- Information Conveyed: **Improvements due to regulatory actions vs. stresses from population growth and development**
- Indicator Audience: **Managers and regulators; public**
- Spatial and Temporal Scales: **Water bodies Region wide; Annual to source specific**

## Contaminants

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Are management actions changing the extent and severity of human health effects?

- Indicator(s):
  - Incidences of human disease caused by consumption of fish and shellfish and recreational contact
  - Level of contaminants in representative fish/shellfish and at-risk humans
  - Annual number of beach and shellfish closures (reopenings)
- Information Conveyed: **Effectiveness of regulatory actions**
- Indicator Audience: **Public, regulators, legislators, educators**
- Spatial and Temporal Scales: **Water bodies Region wide; Annual to source specific**

## Contaminants

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How well are contaminant management actions protecting ecosystem integrity?

- Indicator(s):
  - Sediment quality measure by triad approach
  - Incidence of disease
  - Reproductive success
  - Quality of habitats as affected by contaminants
- Information Conveyed: **Effectiveness of management actions**
- Indicator Audience: **Regulators, public, legislators**
- Spatial and Temporal Scales: **Water bodies region wide; Annual to decadal scales**

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15

## Contaminants

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- Key Partners Needed
  - State, local, regional, federal authorities
  - Scientific community
- Ways to Engage End Users – **Series of state of the environment reports**
- Implementation Approaches
  - Fund coordinating structure to support networking
  - Regular workshops and associated reports
  - Ensure sufficient early warning capacity in the indicators

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16

## Breakout Session Results

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- Fisheries
- Contaminants
- **Eutrophication**
- Aquatic Habitat
- Coastal Development
- Climate Change

## Eutrophication

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- Top Questions
  - 1) What is the extent, severity, and trends of eutrophication impacts?
  - 2) What are the sources of nutrients, can they be controlled, how are they changing?
  - 3) What is the state of management measures and how can they be optimized?
  - 4) What are the appropriate indicators, thresholds, and scales?
  - 5) What are the most important data gaps and research/monitoring needs? How can they be translated to regional/national strategy?

## Eutrophication

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**What is the extent, severity, and trends of eutrophication impacts?**

- Indicator(s):
  - Dissolved oxygen
  - Chlorophyll a
  - Submerged aquatic vegetation
  - Water clarity
- Information Conveyed: **Areal extent, locality, severity, type of impact, and trends**
- Indicator Audience: **Resource managers and scientists, policy makers, legislators, citizens**
- Spatial and Temporal Scales: **Estuary-wide; Seasonal to annual**

## Eutrophication

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**What are the sources of nutrients, can they be controlled, how are they changing?**

- Indicator(s):
  - Measured and modeled loads
  - Land use/cover (load proxy)
  - Population (load proxy)
- Information Conveyed: **Identification of sources, loads (amount of allocation), changes over time**
- Indicator Audience: **Regulators, nutrient managers, scientists, citizens, politicians**
- Spatial and Temporal Scales: **Regional; Seasonal to annual to decadal**



## Eutrophication

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**What is the state of management measures and how can they be optimized?**

- Indicator(s):
  - Dissolved oxygen
  - Chlorophyll a
  - Submerged aquatic vegetation
  - Water clarity
  - Measured and modeled loads
  - Land use/cover (load proxy)
  - Population (load proxy)
- Information Conveyed: Success of management measures
- Indicator Audience: Funding agencies, managers, regulators, engineers, politicians

## Eutrophication

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- Key Partners Needed
- Ways to Engage End Users
- Implementation Approaches

## **Breakout Session Results**

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- Fisheries
- Contaminants
- Eutrophication
- **Aquatic Habitat**
- Coastal Development
- Climate Change

## **Aquatic Habitat**

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- Top Questions
  - How is the extent, distribution, or use of coastal habitats changing over time?
  - How is the ecological condition of coastal habitats changing over time?
  - What are the causes of coastal habitat change over time?

Coastal Habitat = watersheds+ estuaries+ near and offshore

## **Aquatic Habitat**

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**How is the extent, distribution, or use of coastal habitats changing over time?**

**Indicator(s):**

- **Extent per habitat type over time**
  - Large scale mapping, small scale ground surveys
- **Distribution per habitat type**
- **Inventory of human use**
  - Area, percent of public vs. private
  - Area, percent designated for permanent habitat protection

## **Aquatic Habitat**

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**How is the ecological condition of coastal habitats changing over time?**

■ **Indicator(s):**

- **Community Structure**
  - Measure of change of relative abundance of species within habitat
- **Trophic Structure**
- **Species of Concern**

## **Aquatic Habitat**

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### **What are the causes of coastal habitat change over time?**

- Indicator(s) of most important potential causes of habitat loss and degradation (physical and hydrologic alteration, nutrient loading, resource extraction, contaminants, climate change, sediment input)
  - **Extent and percent habitat area altered by tidal restrictions**
  - **Boat registrations**
  - **Seagrass Nutrient Pollution Index**
  - **Indicators relating to other causes assumed covered by other groups**

## **Aquatic Habitat**

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- **Spatial & Temporal Scale**
  - **All indicators are aggregated per habitat type**
  - **Some are measured at large scale (e.g. mapping) on frequency of ~5-year intervals**
  - **Some are measured at small scale, within habitats, at seasonal or annual frequency**

## Aquatic Habitat

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- Audience
  - Primary Users/Needs: Federal, state, local, and provincial regulators and managers, non-profit groups, decision-makers
  - Secondary Users: non-profit organizations, educators, advocacy groups, academic education, industry, public, agencies

## Aquatic Habitat

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- Key Partners
  - all government agencies,
  - academic institutions,
  - private research institutions,
  - NGO's,
  - resource users,
  - consultants,
  - volunteer monitoring groups/community groups

## Aquatic Habitat

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- Ways to engage end users
  - Reporting
  - Web sites
  - Engaging community groups in design and data collection
  - Media
  - Cooperative Extension
  - Small grants and technical guidance.
  - Public meetings

## Aquatic Habitat

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- Implementation approaches
  - Fund coordination body for
    - Collaboration
    - Collation = data mining, data collection
    - Data management
    - Synthesis
    - Reporting
  - Initial coordination body = Coordinator, Data manager, GIS Specialist

## **Breakout Session Results**

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- Fisheries
- Contaminants
- Eutrophication
- Aquatic Habitat
- **Coastal Development**
- Climate Change

## **Coastal Development**

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- Top Questions
  - 1) What is the type, pattern, and rate of land use change?
  - 2) How are these changes impacting the integrity of coastal ecosystems?
  - 3) How is the region responding to changes in coastal ecosystems?

## Coastal Development

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What is the type, pattern, and rate of land use change?

- Indicator(s):
  - Percent change in land cover to more intensive uses
  - Demographic changes (population, etc.)
  - Types of land uses and change
- Information Conveyed: **Status and trends in coastal land cover, land use, and demographics**
- Indicator Audience: **Government managers, regulators, program managers, policy staff, analysts/technical staff**

## Coastal Development

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How are these changes impacting the integrity of coastal ecosystems?

- Indicator(s):
  - Integrity of coastal ecosystems for:
    - Threatened and endangered coastal species
    - Migratory species
    - Invasive species
- Information Conveyed: **Status and trends in the integrity of coastal ecosystems impacted by coastal development**
- Indicator Audience: **Government managers, regulators, program managers, policy staff, analysts/technical staff**



## Coastal Development

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**How is the region responding to changes in coastal ecosystems?**

- Indicator(s):
  - Land conservation
  - Habitat Restoration
  - Land Management (planning, regulatory, etc)
- Information Conveyed: **Management responses to changes in coastal ecosystems**
- Indicator Audience: **Government managers, regulators, program managers, policy staff, analysts/technical staff**

## Coastal Development

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- Key Partners Needed:
  - NOAA (CZM, CSC)
  - EPA (NEP)
  - Environment Canada (e-man and indicators)
  - DFO (habitat and indicators)
  - Ocean Observing Programs (e.g., GoMOOS)
  - State/Provincial Governments (GIS offices)
  - Gulf of Maine Council

## **Breakout Session Results**

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- Fisheries
- Contaminants
- Eutrophication
- Aquatic Habitat
- Coastal Development
- **Climate Change**

## **Climate Change**

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- Top Questions
  - 1) What are the causes?
  - 2) What are the impacts of climate changes to: weather, atmospheric & ocean circulation, ecosystems, and society. How vulnerable are we?
  - 3) What are the societal responses?

## Climate Change

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**What are the impacts of climate changes to: weather, atmospheric & ocean circulation, ecosystems, and society.**

- **Indicator(s):**
  - Precipitation trends
  - Storm frequency and intensity
  - Water temperature surface bottom
  - Relative sea level rise
- **Information Conveyed: Provide information on the impacts of global climate change on the meteorological and physical characteristics of the northwest Atlantic region**
- **Indicator Audience: Coastal environmental managers, scientists**
- **Spatial and Temporal Scales: Regional; Annual to Decadal**

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41

## Climate Change

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**What are the impacts of climate change on biotic ecosystems?**

- **Indicator(s):**
  - Warm vs. cold water finfish species diversity
  - Planktonic diversity
  - Wetlands extent, distribution and composition
  - Marine diseases indices (i.e., MSX, dermo, shell disease)
- **Information Conveyed: Provide information on the impacts of climate change to biotic ecosystems**
- **Indicator Audience: Fisheries managers, health officials, coastal managers, scientists**
- **Spatial and Temporal Scales: Regional; Annual**

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42

# Climate Change

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- Key Partners Needed
  - NOAA – NOS & NMFS, USGS, EPA, USF&WS, States, NGOs, Environment Canada, OURANOS, DFO
- Ways to Engage End Users
  - Agreements (Climate Change Action Plan, NEG-ECP Agreements)
  - Predictive Modeling (Canadian, US, and other Climate Change Model, Downscaling, etc.
    - Global and Regional Models
  - Education – Outreach
    - American Association of Land Planners, etc,
    - Science Museum

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