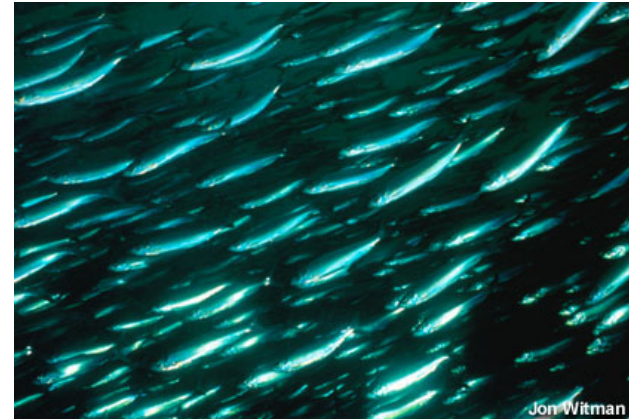


Coastal Pollution and New England Fisheries

Ecosystem Pilot Project
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Objective



Enhance our understanding of the relationship between coastal pollution and New England fisheries to further an ecosystem approach to management



3 Step Approach

- Step 1:
Investigate the current level of understanding pertaining to the impacts of coastal pollution on populations of species integral to New England marine fisheries
- Step 2:
Identify the indicators of coastal pollution and address where and at what level monitoring occurs
- Step 3:
Identify and inventory coastal pollution sites of concern and the species they may impact



Desired Outcome

A foundation that allows managers to understand the scale of the coastal pollution issue, whereby requests for further information and analysis can be made in order to establish management policies incorporating ecosystem approaches to management



Overall Observations

- The affect of pollution on New England marine fish populations is not well understood
- Various types of monitoring programs exist at the Federal, State, and NGO levels
- Coastal pollution occurs at various sites throughout New England
 - Severity/concentration of pollution at each site is categorized differently
 - Detailed analysis would be necessary to link these sites to impacts on fish populations



Step 1: Impacts on Fish Populations

Investigate the current level of understanding pertaining to the impacts of coastal pollution on populations of species integral to New England marine fisheries

Literature review focusing on impacts of:

- chemical contaminants
- nutrient enhancement



Brief list of contaminants of concern

Metals	Ag, As, Be, Cd, Cu, Ni, Pb, Sb, Se, Tl, Zn
Polychlorinated biphenyls (PCBs)	all congeners and Arochlors
Pesticides	aldrin, chlordane, DDT, DDE, DDD, dieldrin, heptachlor
Polycyclic aromatic hydrocarbons (PAHs)	anthracene, fluoranthene, dibenz(a,h)anthracene
Other compounds	benzene, cyanide, dimethylphenol, ethylbenzene, toluene, xylene, pyrene and anthracene

Step 1: Impacts of Pollution

- Chemical Contaminants
 - Larval mortality
 - Reproduction and Development
 - Disease, Lesions, Parasites
- Nutrient Enhancement
 - Fish mortality
 - Community change
 - Reproduction and development





Step 1: Summary

- Lack of studies and knowledge on ways in which coastal pollution affect species integral to New England fisheries
- Information on how pollution affects fish populations is based on speculation
- A knowledge gap presents challenges for fishery managers wishing to adopt an ecosystem-level view towards fishery management



Step 1: Summary

- Efforts from leading fishery science centers and academic institutions addressing impacts of pollution on New England fish populations appear to be minimal.
- May be a lack of communication between fisheries research divisions, academic scientists, and managers



Step 2: Monitoring and Indicators

Identify the indicators of coastal pollution with a focus on:

- Where monitoring occurs
- Level at which pollutants are monitored



Step 2: Monitoring and Indicators

- National Coastal Conditions Report II (EPA 2005)
 - Water Quality Index
 - dissolved inorganic nitrogen & phosphorus, chlorophyll a, water clarity, dissolved oxygen
 - Sediment Quality Index
 - sediment toxicity, sediment contaminants, total organic carbon
 - Benthic Index
 - Fish Tissue Contaminants Index



Step 2: Monitoring and Indicators

- Gulf of Maine Council on the Marine Environment
 - Environmental Quality Monitoring Committee
 - Coastal indicator workshops & summits
 - Inventory of GOM and LIS monitoring programs



Step 2: Summary

- Various levels of monitoring
EPA, State agencies, NGO's
- Working to put together an inventory/database of areas and corresponding number of sampling stations
- Inventorying location and identifying numbers of sites is beneficial to furthering our understanding, however examining how this data is incorporated into studies focused on fisheries may be more useful to managers



Step 3: Coastal Pollution Sites

Identify coastal pollution sites with focus on:

- Pollutants emitted
- Marine species associated with the areas and pollutants



Step 3: Coastal Pollution Sites

Regional Perspective

- NOAA National Estuarine Eutrophication Assessment (1999) - Estuaries with high eutrophic condition

Casco Bay, ME; Boston Harbor, MA; Long Island Sound, CT

- National Sediment Quality Survey (EPA 2004) - Watersheds containing areas of probable concern for sediment contamination

Lower Connecticut, Narragansett, Quinnipiac, Housatonic, Southern Long Island.

Step 3: Coastal Pollution Sites

National Priority List

- 13 past/present coastal sites
- New Bedford Harbor, Portsmouth Naval Shipyard
- Nursing grounds, forage habitat
- Atlantic cod, flounders, Atlantic herring, and others



http://www.darp.noaa.gov/northeast/new_bedford/

Step 3: Coastal Pollution Sites



Combined Sewer Systems (CSSs)

- Convey domestic, commercial and industrial wastewaters and storm water runoff
- 421 CSSs in New England with potential impacts to the coast



Step 3: Coastal Pollution Sites

Individual States

- Lists of contaminated or potentially contaminated properties
 - Connecticut
 - <http://www.dep.state.ct.us/wst/remediation/sites/sites.htm>
- Access to statewide and town data files on topics such as point locations of hazardous material sites
 - Rhode Island
 - <http://www.edc.uri.edu/rigis/>



Step 3: Summary

- Significant level of detail is associated with NPL sites and affected marine species
- A handful of New England states provide site locations, however they are not easily distinguishable as coastal sites and rarely identify species of concern
- Working through state databases and municipal data, incorporating suspected affected marine organisms, will provide the layer of detail necessary to understand the complexity of a coastal sites inventory



Step 3: Summary

- Fishery managers will likely require lists and databases that are comprehensive, updated frequently, and are coordinated with the efforts of other New England states
- Visually depicting data currently available onto one map should be the next step in this process



Overall Conclusions

- Research efforts examining causal links between pollution and marine fish populations will be necessary in order for management to proceed. Council members and staff need to consider and question why this information is not available
- Various indicators and monitoring networks are used by NGOs, and Federal and State agencies. Collected data needs to be incorporated into a working database designed for fisheries managers



Overall Conclusions

- A thorough inventory of Federal, State, and municipal coastal pollution sites is necessary prior to integrating pollution data/impacts into fisheries management practices



Future Work

- Increase efforts examining this issue
- Visually depict currently available data
- Communicate to the appropriate agencies and institutions that there is a lack of studies examining the relationships between pollution and marine fish populations that are necessary for management concerns
- Identify and address stakeholder concerns and establish networks which may expose leverage points ultimately facilitating approaches to this large scale issue



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