



**Bureau of Ocean Energy Management,  
Regulation and Enforcement  
Environmental Studies Program**

**"Ecological Characterization of Potential MHK  
Resource Areas: Current and Future Studies of  
the US Department of Interior"**

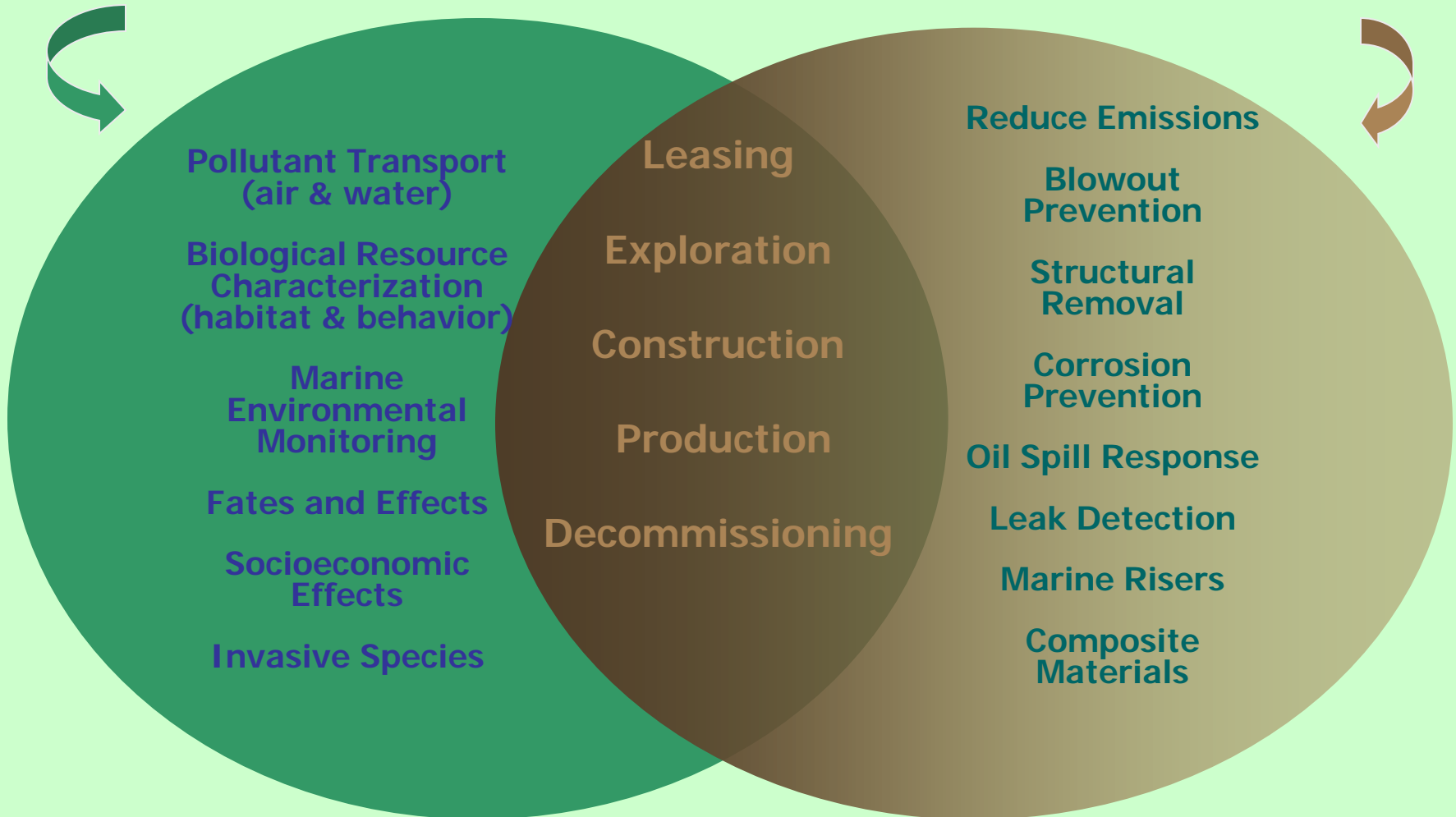
August 19, 2010

Dr. Rodney Cluck  
Chief, Environmental Sciences Branch

# Using Science as our Guide

## Environmental Studies

## Technology Assessment & Research



# Environmental Studies Program Mission

To provide the information needed to predict, assess, and manage impacts from offshore energy and marine mineral exploration, development, and production activities on human, marine, and coastal environments.



# Key Science Mission

Oil and gas, sand and gravel, and renewable energy development on the OCS

- ◆ Obtain Quality Information For Environmental Impact Assessment To Support Leasing
  - Sales and On-lease Activities
- ◆ Monitor Environmental Changes
  - Natural and Anthropogenic

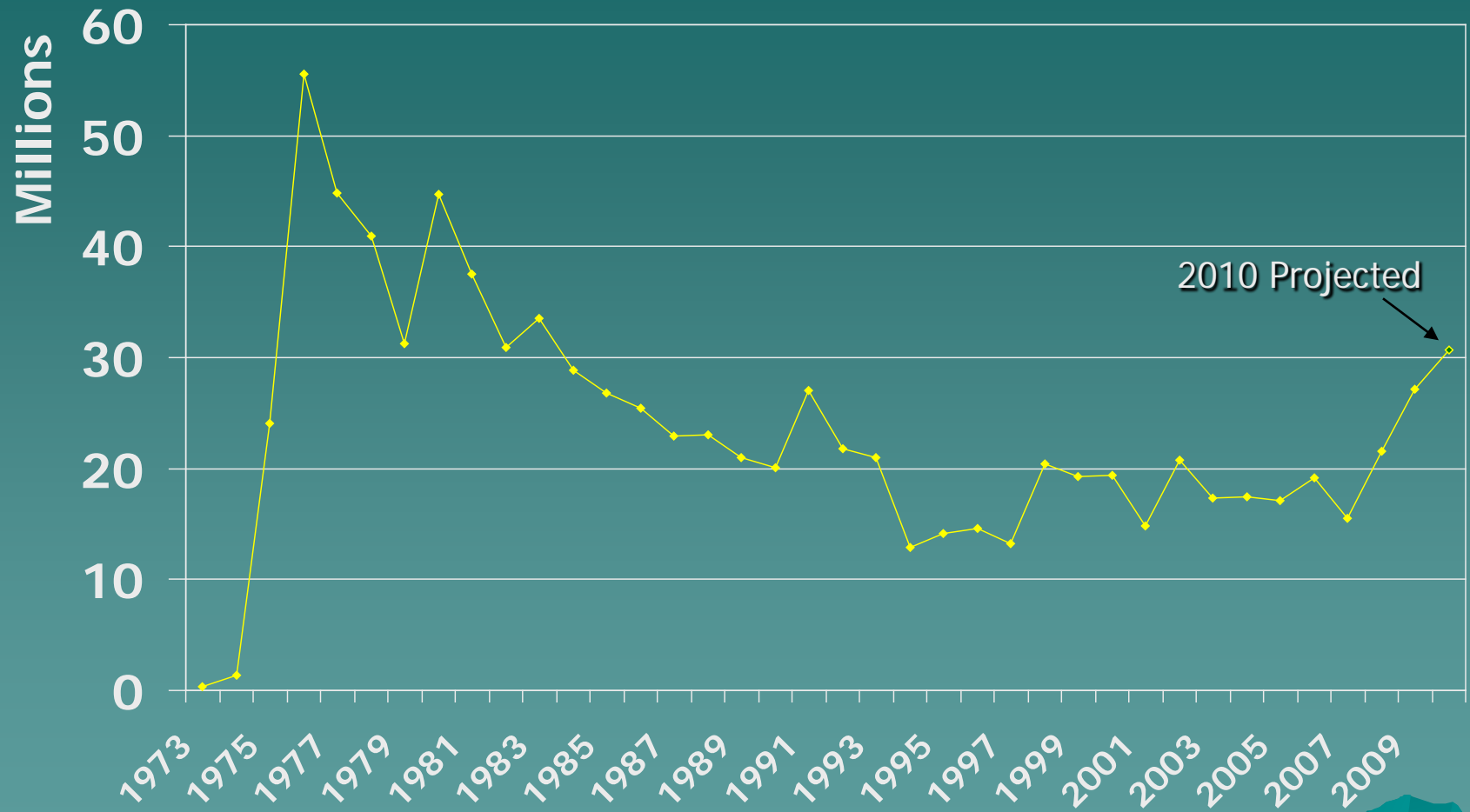




# Need for Information

- ◆ Tied to Decisions
  - Design of the Project
  - Mitigation and Regulations
    - ◆ Industry proposals
    - ◆ Agency requirements
      - BOEM, ESA/MMPA (FWS/NMFS), EPA, etc.
- ◆ Hone in on areas with likely activity
  - Known leases
  - Known activities
  - Best chances for development/production

# ESP Expenditures 1973-2009



# ESP: A 30+ Year History of Applied Environmental Studies

North Atlantic Physical Oceanography



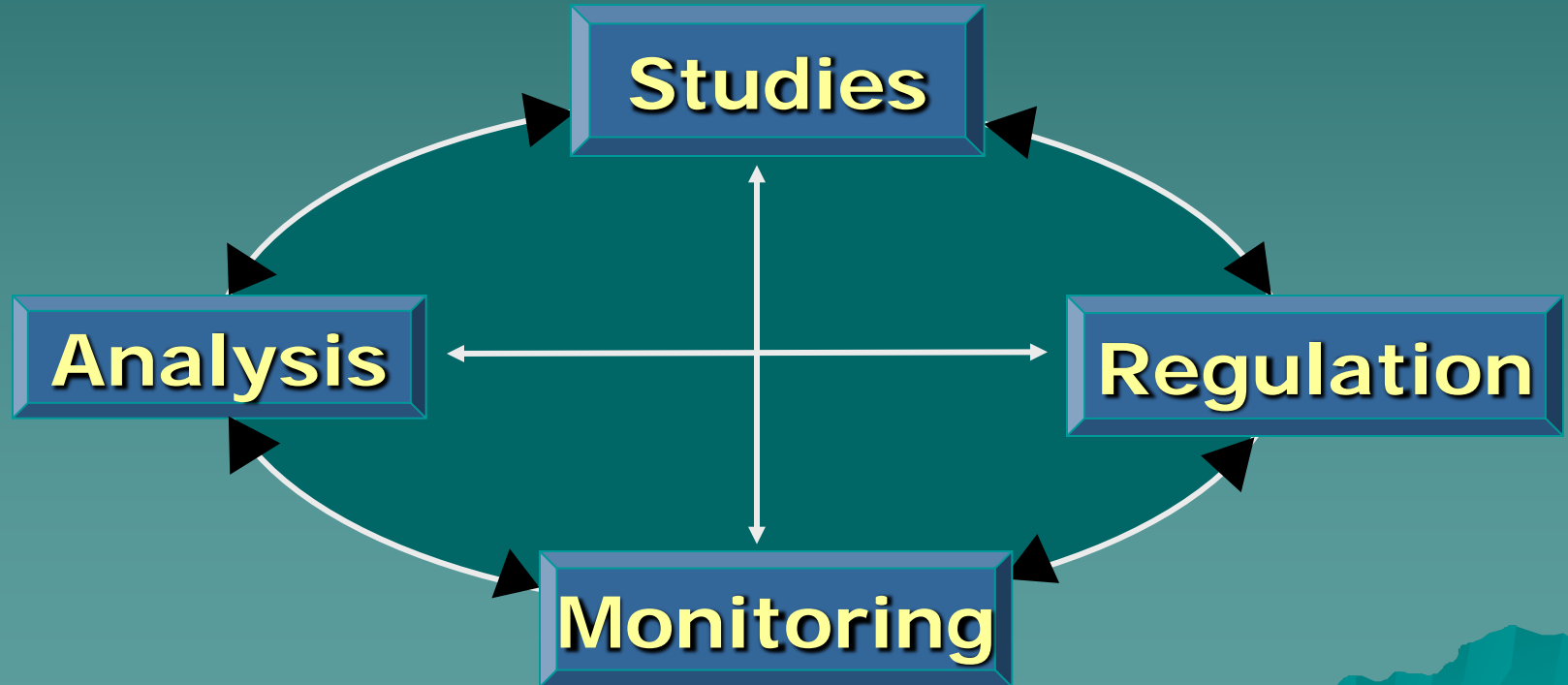
SoCal Baseline



Examples of two early studies

# An Adaptive Approach to Management

## Mission-focused Studies





# What Drives the Studies Agenda: Multiple Uses of the OCS



# What Drives the Studies Agenda: NEPA and Permitting



**Marine Mammal  
Protection Act**

**Federal Water  
Pollution  
Control Act**



**National Historic  
Preservation  
Act**

**E.O. 12898:  
Environmental  
Justice**

**NEPA  
Permits**

**Clean  
Air Act**

**Coastal Zone  
Management Act**

**Magnuson-Stevens  
Fishery Conservation  
and Management  
Act**

**Endangered  
Species Act**



# What Drives the Studies Agenda: Information Needs

## National

- Partnership: NOPP, OST-IPC (formerly JSOST)
- Five-year schedule

## Pacific

- Developed/producing leases
- Renewable energy

## Atlantic

- Sand and gravel
- Renewable energy

## Alaska

- Beaufort, Chukchi Sea exploration

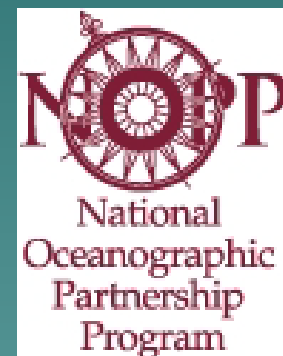
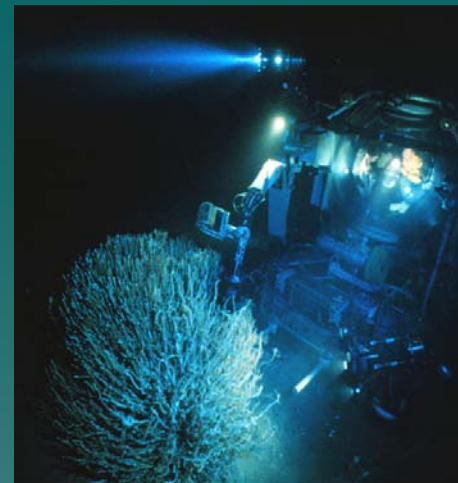
## Gulf of Mexico

- Deepwater
  - Active leasing
  - Sand and gravel





# How Do We Work?



- ◆ Competitive Contracts
- ◆ Inter-Agency Agreements
  - Partnering** NOAA; ONR; NASA; NSF; USGS; FWS; NPS; DOE; etc.
- ◆ Coastal Marine Institutes
- ◆ Cooperative Ecosystem Studies Units
- ◆ Cooperative Agreements with Universities



# Impact Producing Factors

- ◆ Vessel traffic
- ◆ Visual and aesthetic interference
- ◆ Air emissions
- ◆ Bottom disturbance
- ◆ Discharges
- ◆ Infrastructure (emplacement and presence)
- ◆ Noise
- ◆ Lighting
- ◆ EMF



# Environmental and Socioeconomic Resources and Issues

- ◆ Air Quality
- ◆ Water Quality
- ◆ Marine Mammals
- ◆ Sea Turtles
- ◆ Marine and Coastal Birds
- ◆ Bats
- ◆ Seafloor Habitats
- ◆ Physical Oceanography
- ◆ Coastal Habitats
- ◆ Socioeconomics
- ◆ Cultural Resources
- ◆ Fisheries
- ◆ Multiple Use Conflicts




# Authority from Energy Policy Act of 2005

- ◆ BOEM **has exclusive jurisdiction** to issue leases and grant rights-of-way for hydrokinetic projects on the OCS
- ◆ **FERC will issue licenses** for the construction and operation for hydrokinetic projects on the OCS.



# Three Types of Leases

1. **Commercial Leases** for full development and power generation
  2. **Limited Leases** for resource assessment and technology testing
  3. **Research Leases** for Federal agencies or States (may include State universities)
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# Two Types of Processes and Lease Instruments


## Processes

1. Competitive Leasing Process
2. Non-competitive Leasing Process

## Instruments

1. Leases (commercial, limited and research)
  2. Grants (ROWs and RUEs)
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# OCS Research Leases

- Research leases can only be issued to a **Federal agency or State**
  - Such leases may be issued only in areas where BOEM has determined, **after public notice**, that there is **no competitive interest**
  - **BOEM will not charge any fees** for the purpose of ensuring a fair return
  - Agreements on the terms and conditions will be **negotiated on a case-by-case basis**
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# OCS Research Leases

- For hydrokinetic research there will be early **consultation with FERC** to determine whether a license or exemption is required
- If a FERC license or exemption is required, we will proceed with issuance of a commercial lease instead of a research lease
- If Federal agency is applicant, FERC license is not needed

# DOI/FERC MOU

- Signed by Secretary Salazar & Chairman Wellinghoff on April 9, 2009
  - **Clarified jurisdictional authority** regarding offshore hydrokinetic energy projects on the OCS.
  - Establish a **cohesive, streamlined process** to accelerating development of offshore renewable energy projects.
- 
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# BOEM - FERC Collaboration

- **BOEM/FERC Guidance on Regulation of Hydrokinetic Projects on the OCS.**
- Emphasis on early and active involvement of both agencies when wave or current energy projects are proposed for OCS lands, including coordination with state and local stakeholders.
- Federal Register Final Rule:

<http://www.boemre.gov/offshore/RenewableEnergy/PDF/FinalRenewableEnergyRule.pdf>



# Coordination and Consultation

- ◆ BOEM will coordinate and consult with affected **State, local, and tribal governments and Federal agencies** that may be affected by a lease/grant. (30 CFR 285.102)
- ◆ BOEM may invite interested parties to join in establishing a **consortium or working group** to facilitate the sharing of information and promote efficient, expeditious and orderly OCS renewable energy development.



# Studies in Support of Renewable Energy Development

Wind Energy

Wave Energy

Ocean Current Energy

Solar Energy

Hydrogen



# **Pacific**

## **N. California, Oregon and Washington**

- ◆ Marine Mammal and Seabird Surveys of Potential Renewable Energy Sites Offshore Northern California, Oregon and Washington (2010-2013)
  - Interagency Agreement with USGS
  - Objective: Review previous surveys. Offshore monthly field surveys, assessment of data with other sources.



# Pacific

## Oregon and Washington

- ◆ Survey of Benthic Communities near Potential Renewable Energy Sites Offshore Oregon and Washington (2011-2014)
  - Awarded to Oregon State University
  - Objective: To provide a basic description of the benthic communities in the selected seafloor sites to build community profiles in a geospatial seafloor GIS based mapping format.


# Pacific Southern California

- ◆ Habitat Mapping in the Santa Barbara Channel (2010-2012)
  - Interagency Agreement with USGS
  - Study for oil and gas and planning for potential offshore alternative energy sites.
  - West Coast Governor's Agreement on Ocean Health initiative for use in decisions on offshore renewable and Marine Protected Areas.

# Pacific Southern California

- ◆ Regional Importance of Manmade Structures as Rockfish Nurseries (2010-2013)
  - Interagency Agreement with USGS
  - Ecosystem level understanding of decommissioning existing platforms and GIS integrated mapping for future decision making.

# Pacific & Atlantic Literature and Knowledge Synthesis

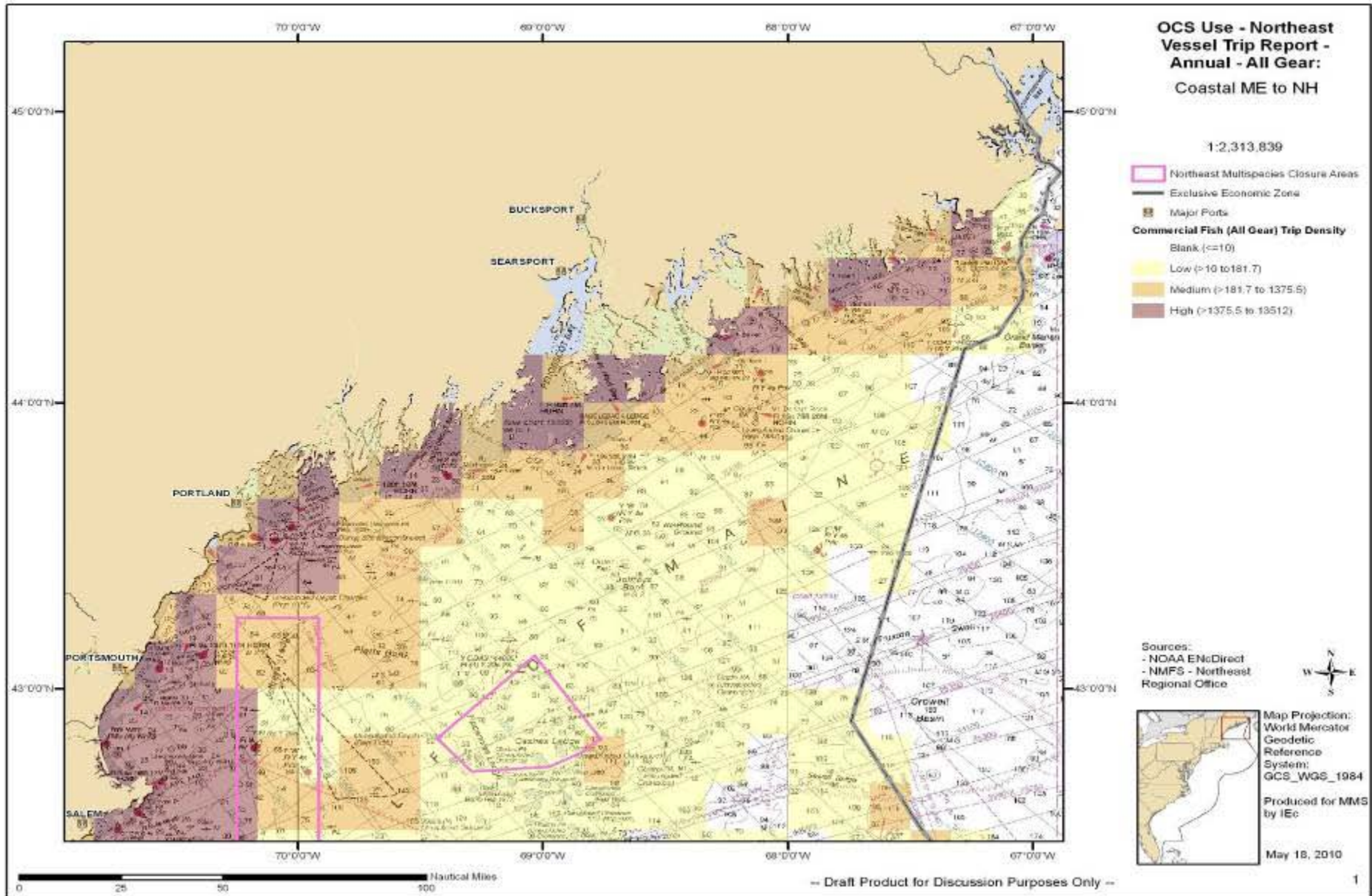
- ◆ Update Summary of Knowledge: Selected Areas of the Pacific Coast (2010)  
**Complete**
  - ◆ North and Central Atlantic Information Resources: Data Search and Literature Synthesis (2010)
  - ◆ South Atlantic Information Resources: Data Search and Literature Synthesis (2011)
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# Pacific & Atlantic OCS Renewable Energy and Space-Use Conflicts and Related Mitigation

- ◆ Identify opportunities for communication and cooperation
- ◆ Information Gap identified as an important issue:
  - Worldwide Synthesis and Analysis
  - Regional Associations (e.g. NROC, WCGA)
- ◆ Objective: Identify space uses, potential conflicts, and avoidance and/or mitigation strategies/techniques
- ◆ Project awarded to Industrial Economics Incorporated (**IEC**) in September 2009.

# Geo-Spatial Database



# Atlantic Marine Assessment Program for Protected Species (AMAPPS)

- ◆ Goal is to collect broad-scale information over multiple years on the seasonal distribution and abundance of marine mammals, marine turtles, and sea birds
- ◆ Joined other federal agencies in a multi-year survey of marine life along the U. S. Atlantic coast
- ◆ Support marine spatial planning and ecosystem-based management decisions
- ◆ 30 turtles tagged in Atlantic  
[http://www.seaturtle.org/tracking/?project\\_id=510](http://www.seaturtle.org/tracking/?project_id=510)



# Atlantic Eco-Spatial Information Database (ESID)

- ◆ Compile and geo-reference ecological information resources in a searchable geospatial database
- ◆ Develop a support tool for activities permitted by BOEMRE such as environmental review of leasing activities
- ◆ Export data from the database
- ◆ Spatial data such as GIS layers
- ◆ Non – spatial (scientific papers, reports)
- ◆ Example Data Categories Include:
  - Benthic Ecology
  - Geology
  - Underwater noise
  - Air Quality
  - Etcetera



# Eco-Spatial Information Database (ESID)

**Manage ESID Form**

Resource Table

Select	ESID_ID	Category	Title
<input checked="" type="checkbox"/>	1	Geology	Geology of the Continental Shelf
<input type="checkbox"/>	2	Acoustic Environme	Sonar and Coral
<input type="checkbox"/>	3	Geology	Atlantic Sea Mounts
<input type="checkbox"/>	4	Geology	Undersea Trenches
<input type="checkbox"/>	5	Water Quality	Dissolved Methane
<input type="checkbox"/>	6	Incidental Topics	Starfish Reproduction
<input type="checkbox"/>	7	MMC	Leasing for Oil Drilling
<input type="checkbox"/>	8	Water Quality	Stormwater Runoff and the Marine Envi
<input type="checkbox"/>	9	GIS	Coral Distribution Geodatabase
<input type="checkbox"/>	10	Benthic Ecology	Lobsters and the Food Cycle
<input type="checkbox"/>	11	Pelagic Ecology	Schooling Behavior of Tuna

Record: 1 of 11

**Export**

☐ Full ESID ☐ MMC Data  
☐ Public ESID ☒ Schema Only  
☐ Reference

Receipt:

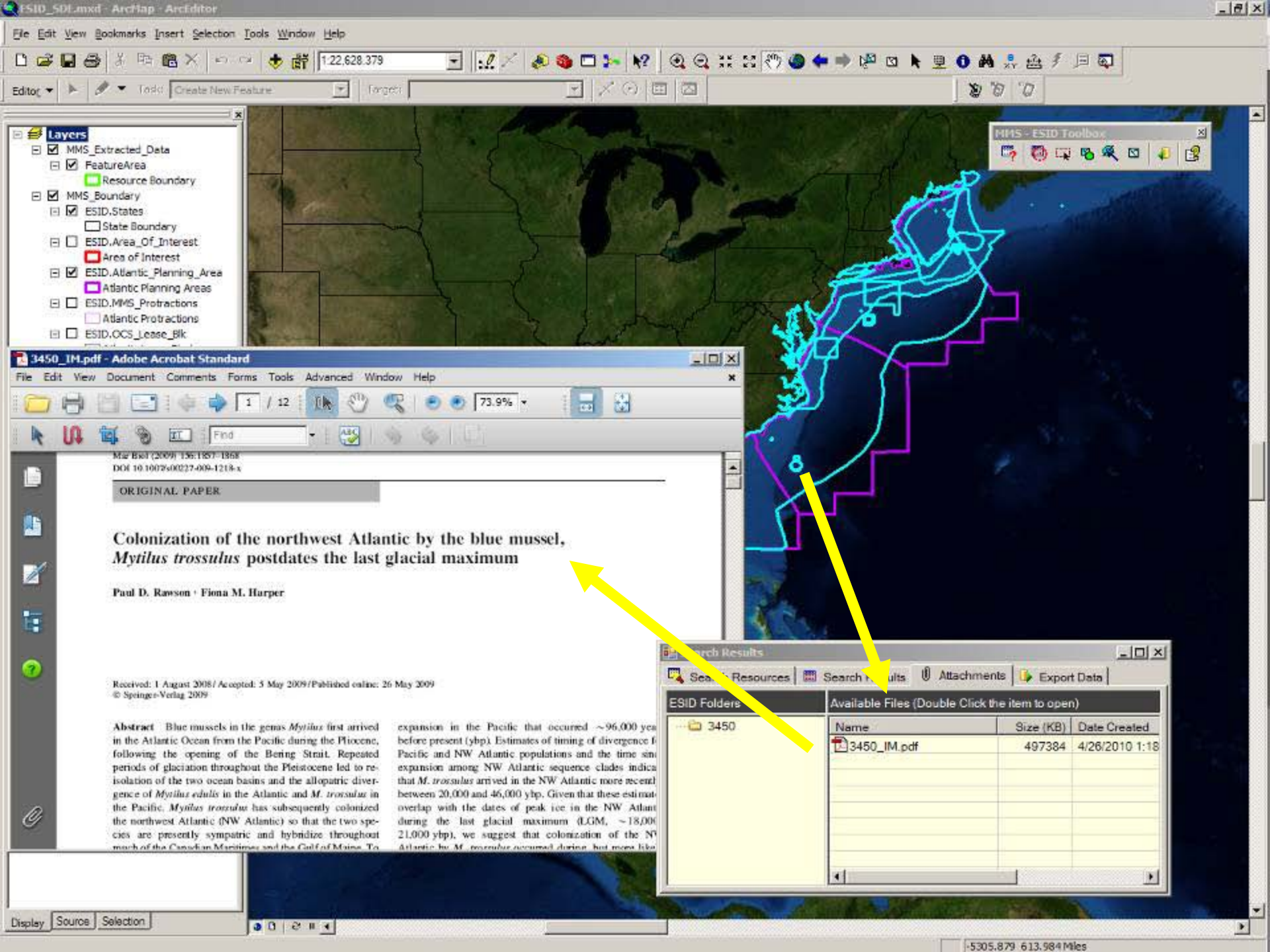
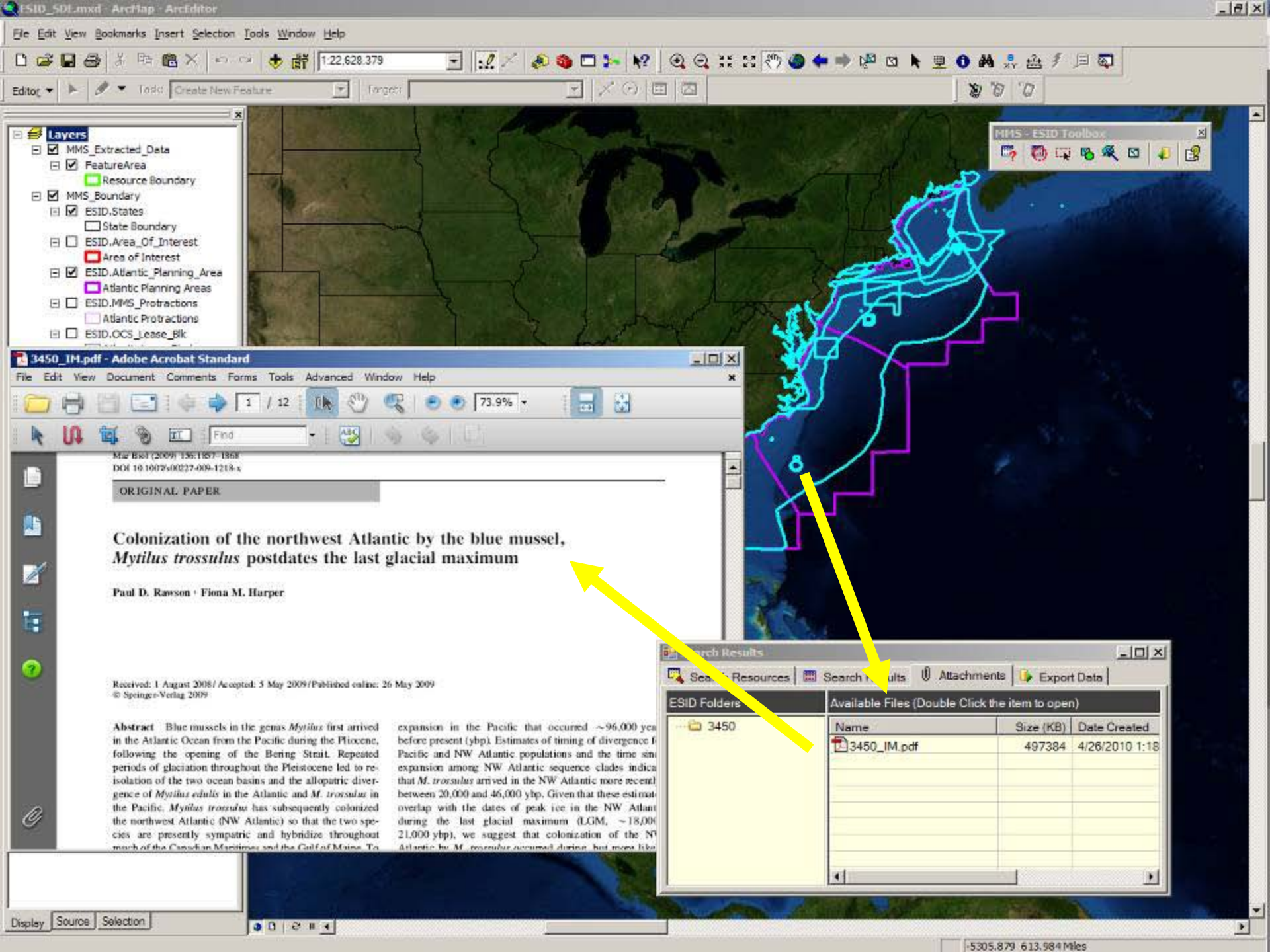
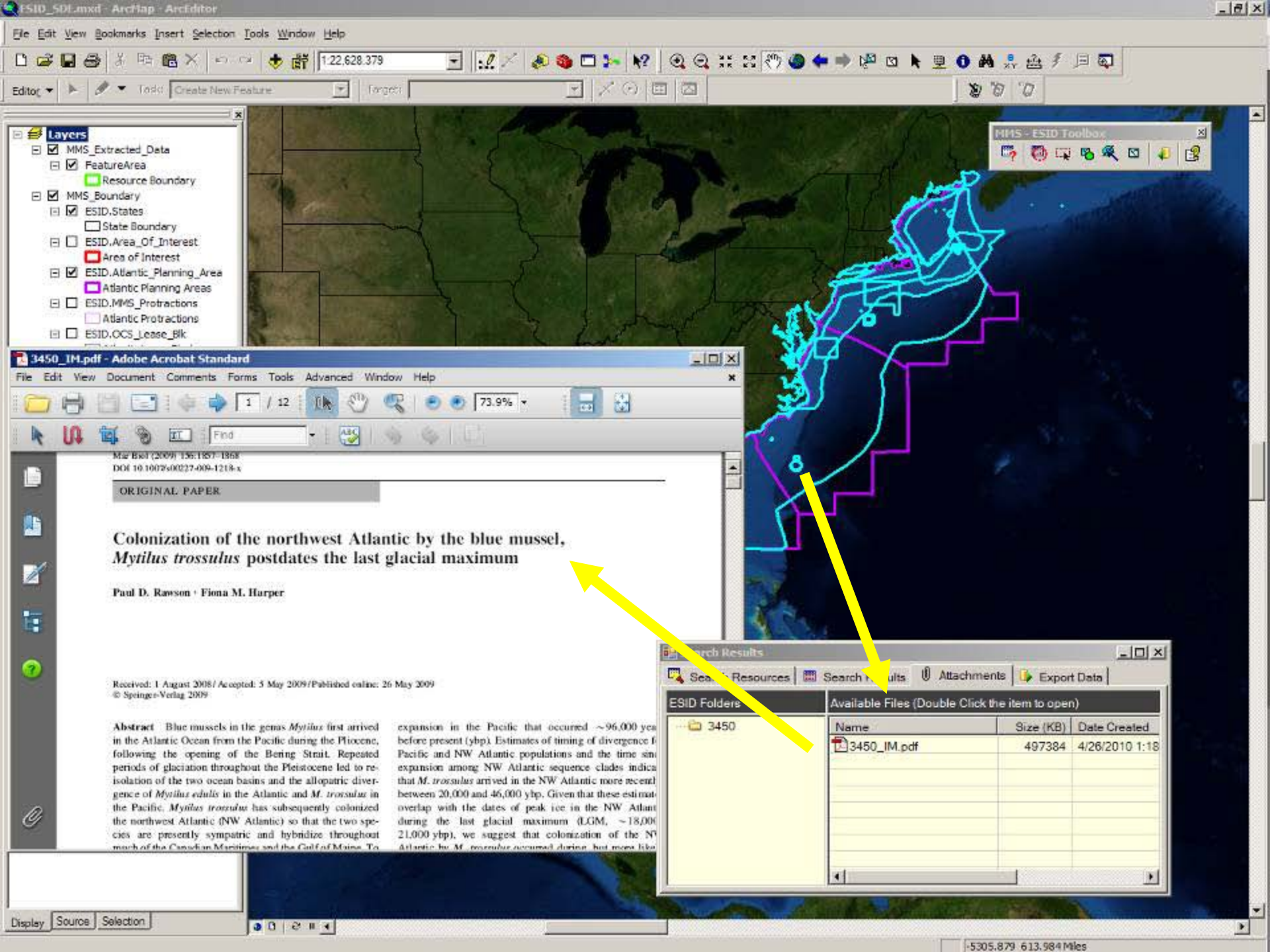
**Selected Resource**

ESID\_ID:   
Category:   
Title:   
Source:   
Contact:   
Copyright:   
Cost:

**Supporting Data**

Receipt:    
Reference:    
File:    
GIS Data:    
Upload Summary: 

Upload Successful



# Completed Studies

- ◆ Worldwide Synthesis and Analysis of Existing Information Regarding Environmental Effects of Alternative Energy Uses on the OCS and Workshop (2008)
- ◆ Determining Night Time Distribution of Long-tailed Ducks Using Radio Telemetry (2008)
- ◆ Comparative Study of OWTG Standards (Joint Industry/Federal Study on Standards) (2008)





# Ongoing Studies - Avian

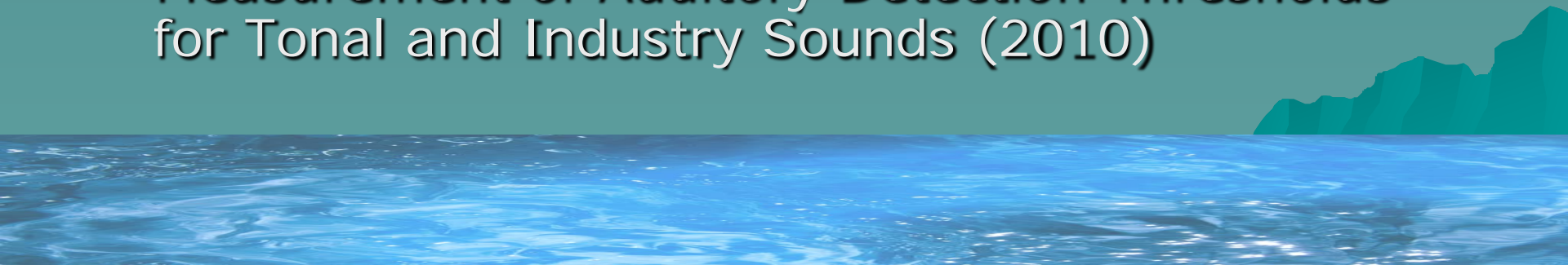
- ❖ Potential for Interactions between Endangered and Candidate Bird Species with Wind Facility Operations on the Atlantic OCS (2011)
- ❖ Determining Distributions and Movements of Long-tailed Ducks Using Satellite Telemetry (2011)
- ❖ Automated Analysis of Bird Vocalization Recordings (2011)
- ❖ Surveying for Marine Birds in the Northwest Atlantic (2014)





# Ongoing Studies - Biology

- Atlantic Marine Mammal and Sea Turtle Data Search and Literature Synthesis Including Stranding and Nesting Sites (2010)
- Effects of Pile Driving Sounds on Auditory and Non-auditory Tissues of Fish (2011)
- Workshop on the Status of Passive Acoustic Monitoring (PAM) (2010)
- Effects Of EMF From Transmission Lines On Elasmobranchs And Other Marine Species (2010)
- Hearing in Sea Otters (*Enhydra lutris*): Measurement of Auditory Detection Thresholds for Tonal and Industry Sounds (2010)



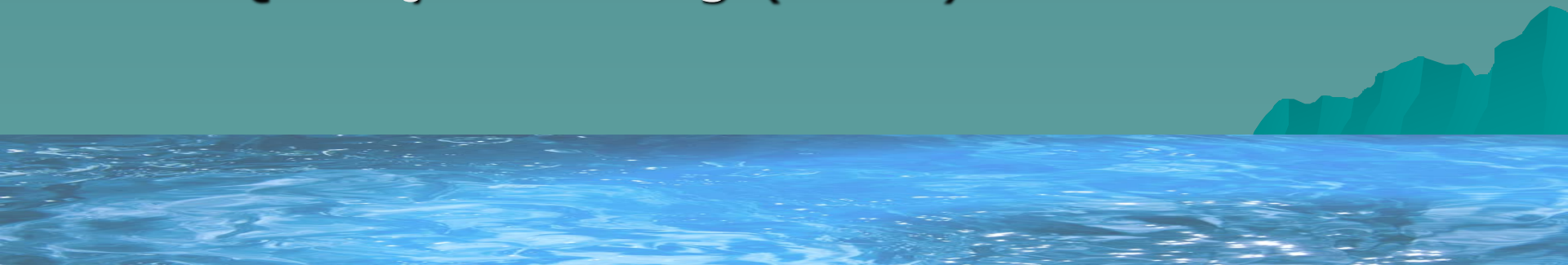
# More Ongoing Studies

## ◆ Geospatial Data Collections

- Compendium of Avian Information and Comprehensive GIS Geodatabase (2011)

## ◆ Air Quality

- Meteorological and Wave Measurements for Improving Meteorological and Air Quality Modeling (2010)



# New Starts this Year

## ◆ Biology

- Pilot Study: Aerial High-Definition Imagery Surveys for Seabirds, Marine Mammals, and Sea Turtles on the Atlantic
- Improving Cetacean Electronic Data Loggers

## ◆ Sound

- Acoustic Monitoring of Temporal and Spatial Abundance of Birds Near Structures -- Atlantic and Gulf of Mexico
- Characterization and Potential Impacts of Noise Producing Construction and Operation Activities on the OCS

# **NOPP BAA (BOEM/DOE/NOAA)**

- ◆ Characterization & Potential Impacts of Noise Producing Construction & Operation Activities on the Outer Continental Shelf (OCS)
- ◆ Protocols for Baseline Studies and Monitoring for Ocean Renewable Energy
- ◆ Evaluation of Environmental Monitoring Technologies for Offshore Renewable Energy
- ◆ Sub-Seabed Geologic Carbon Dioxide Sequestration Best Management Practices
- ◆ Renewable Energy Visual Evaluations
- ◆ Ocean Renewable Energy Siting in the Context of Coastal and Marine Spatial Planning



# E.S.P.I.S.

- ◆ Environmental Studies Program Information System
  - Completed ESP reports and technical summaries available online
  - Full electronic and searchable pdf files, including images and graphics

<https://www.gomr.boemre.gov/homepg/espis/espismaster.asp?appid=1>

## Ocean Science and Technological Information Related to Offshore Energy



# More Information...



On the Web at:

<http://www.boemre.gov/eppd/sciences/esp/index.htm>

Thank you!

BOEM

Environmental Studies Program

