BOEM ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

BOEM OCS Region: Gulf of Mexico

Title: **E**co**S**patial **I**nformation **D**atabase – U.S. Atlantic Region (GM-08-x13)

Planning Area: North Atlantic, Mid-Atlantic, South Atlantic

Total Cost: $2,213,310 **Period of Performance:** FY 2009-2015

Conducting Organization: AMEC Earth & Environmental, Inc.

BOEM Contact: Dr. Rebecca Green

Description:
Background: Most of the past Bureau of Ocean Energy Management (BOEM) environmental work in the Atlantic region has been site specific and targeted rather than focused on broad geographic scales. With new offshore alternative energy activity and the possibility of new oil and gas activity, BOEM needs comprehensive information about the ecology of the U.S. Atlantic Region. Background material and geographic information system (GIS) based maps that overlay many types of information are needed for BOEM to make critical decisions about Bureau-regulated activities, such as permitting and siting of development.

This project will collate existing sources of information to produce a database containing ecological and spatial information for portions of the BOEM Atlantic Region. This database is the EcoSpatial Information Database (ESID, pronounced "ee-sid") and is designed to accept additional ecological information for all marine and coastal areas of the U.S. The ESID is accessible and searchable through a map interface.

The ESID contains (and/or link to) ecological information resources and includes an annotated bibliographic entry for each resource, GIS files for each resource showing study areas or sampling sites, metadata for each resource, and any available associated GIS or data files. In addition, data was extracted from resources addressing specific renewable energy areas of interest. Resources can be accessed via a map interface with search capability. The ESID contains background GIS layers of bathymetry and other relevant information such as the shoreline, the EEZ, states, cities, marine protected areas, MMS protractions, latitude and longitude, etc. The potential types of information the ESID provides includes access to PDF files of documents, annotated bibliographic

entries, metadata, GIS files of resource footprints or sampling sites, data files accompanying (or extracted from) a resource, and hyperlinks to resource information. Ecological information incorporated into the ESID includes subjects such as benthic habitats, spatial and temporal distributions of species, commercially important species, and migratory pathways. Environmental data such as topography, sediment, salinity, temperatures, currents, and others will also be included.

The ESID database provides the foundation for an ecosystem-based approach to management of the Atlantic Region. Ecology (by definition) deals with the interaction of living organisms with their environment. This encompasses both plants and animals as organisms and their relations to all aspects of the environment such as sediment, water quality, currents, irradiance, etc. It also includes the interaction of organisms with each other. All these components of ecology must be considered in ecosystem-based management of the Atlantic Region and are incorporated into ESID.

Objectives: This project created a searchable database with a map interface, the **E**co**S**patial **I**nformation **D**atabase, of georeferenced ecological information resources and associated data to support ecosystem-based management of activities permitted by BOEM in the Atlantic Region.

Methods: Ecological information for a portion of the Atlantic Region was compiled and assimilated using the following general methods.

1. Conducted thorough literature searches to collate ecological information resources for the areas of interest. Scanned documents to PDF format as needed.
2. Documented resource acquisition and copyright.
3. Created an annotated bibliography referencing every resource.
4. Created metadata for every resource.
5. Created GIS files defining the study area, sampling sites, or "footprint" for every resource.
6. Extracted data from resources pertinent to renewable energy areas of interest.
7. Designed and created the ESID containing the following:
    a. Annotated bibliography.
    b. Metadata.
    c. GIS files of resource footprints.
    d. Background GIS layers: bathymetry and other relevant information such as the shoreline, the EEZ, states, cities, marine protected areas, BOEM protractions, latitude and longitude, etc.
    e. Information resources: documents, reports, articles, GIS files, data files, images, links to online resources, etc.
    f. Hyperlinks to resources (some resources will only be linked and will not reside in the ESID).
    g. Data extracted from resources pertinent to renewable energy areas of interest.

8. Create a web-based map interface with search, reporting, and editing capability.
9. Write documentation and instructions.
10. Work closely with BOEM to produce a suitable system that works efficiently.

Products: **E**co**S**patial **I**nformation **D**atabase with annotated bibliography, database of ecological resources, ecological data files, GIS files, and ArcMap interface; list of data files for the Multi-Purpose Marine Cadastre; peer-reviewed journal article; conference presentation; final report.

Importance to BOEM: With new offshore alternative energy activity and the possibility of new oil and gas activity, BOEM needs comprehensive information about the ecology of the U.S. Atlantic Region. This project will collect, organize, and provide access to needed information.

Status: Awarded September 24, 2009. Web-based "cloud" interface is now available online (https://esid.boem.gov).

Final Report Due:	Completed and available in ESPIS.
Publications:	*Marine Policy* journal article (Zimmer et al., 2014); Conference presentations at ASLO 2011, ESRI Users Conference 2013, and Coastal GeoTools 2013.
Affiliated WWW Sites:	https://esid.boem.gov
Revised date:	November 2014
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