

SAFMC Map Services and Digital Dashboard

Habitat and Ecosystem Workshop

Tina Udouj

Fish and Wildlife Research Institute

Orlando, FL
June 11, 2012

PROJECT BACKGROUND

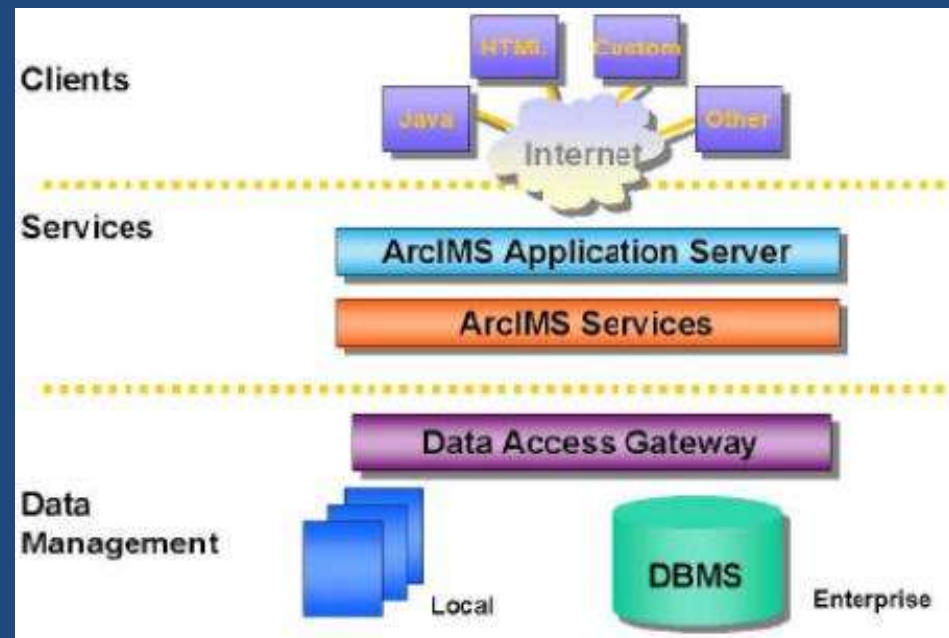
Ongoing Tech Support

Since 2003, the Fish and Wildlife Research Institute (FWRI) has collaborated with SAFMC staff to compile, create and host spatial and non-spatial data relevant to essential habitats, management zones, and fisheries in the South Atlantic ecosystem. Throughout the years, FWRI has improved SAFMC's web presence and data accessibility by employing the latest technologies.

- Phase 1 – develop and host an Internet Map Server (IMS) application to provide access to related GIS data
- Phase 2 – develop a Habitat and Ecosystem Homepage to distribute information concerning the Council's move to Ecosystem-Based Management, document conversion
- Phase 3 –transition homepage to a Portal application to facilitate development of a Fishery Ecosystem Plan
- Phase 4 – EcoSpecies and EcoResearch projects , GeoPDF maps
- Phase 5 – transition to ArcGIS Server
- Phase 6 – Create map services and develop .NET ADF web application
- Phase 7 – improve accessibility and performance by incorporating Flex technology for SAFMC web applications
- Phase 8 – develop a digital dashboard to enhance the accessibility, ease of use, and visibility of collaborative projects.

Phase 1 – Internet Mapping System (IMS)

- Develop and host an Internet Map Server (IMS) application to provide access to regional GIS data
- Create and compile GIS data layers relevant to the site
- Integrate digital documents (management plans, regulations, etc), video, and stills



GIS Data Layers

- **Base Map Layers** – roads, states, counties, cities, Bathymetry, National Data Buoys, Marine Facilities, ATONS, Land Cover
- **Management and Regulatory** – special management zones, proposed marine protected areas, state waters, EEZ, sea turtle sanctuary, crab spawning sanctuary
- **SAFMC Gear Restrictions** – fish traps, sargassum, black seabass pots, octocorals, bottom longlines
- **Marine Sanctuaries** – data for Gray’s Reef and Florida Keys
- **Species Occurrence** –MARMAP layers such as white grunt, vermillion snapper, red porgy, gray triggerfish, greater amberjack, and black seabass
- **Coral Habitat Areas of Particular Concern (HAPCs)** – Oculina studies: Cleila and ROV dive tracks, multibeam survey
- **Unique Habitats** – Dolphin–Wahoo EFH-HAPC, Deep Water Coral, right whale critical habitat
- **General Habitats** – artificial reefs, fish nursery areas, seagrass, mangroves, salt marsh, tidal flats
- **Imagery** – various scales of nautical charts

GIS Data Sources

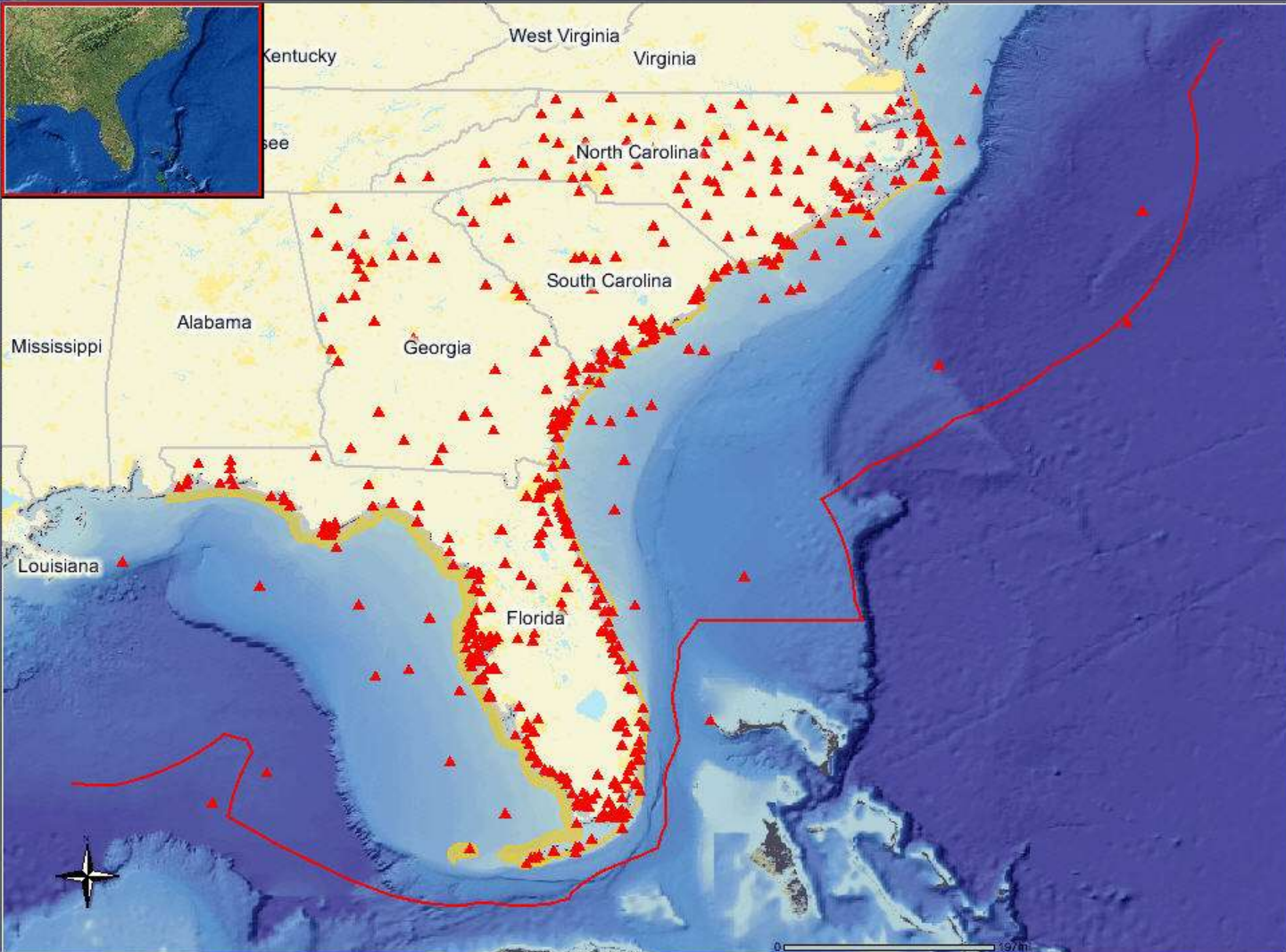
- FWRI Marine Resources GIS
- NOAA Coastal Services Center
- North Carolina Department of Natural Resources, Division of Marine Fisheries
- Grays Reef National Marine Sanctuary
- South Carolina Department of Natural Resources
- University of North Carolina, Wilmington
- Harbor Branch Oceanographic Institute
- Skidaway Institute of Oceanography
- National Benthic Inventory
- The Nature Conservancy
- ESRI
- SECOORA - Southeast Coastal Ocean Observing Regional Association

South Atlantic Habitat and Ecosystem IMS

An integrated approach for management and research

SAFMC FWC FWRI

- Legend
- Zoom In
- Zoom Out
- Zoom Full Extent
- Zoom Active Layer
- Zoom Last Extent
- Pan
- Hotlink
- Identify
- Query
- Find
- Buffer
- Select by Rectangle
- Select by Line/Polygon
- Clear Selection
- Print
- Download



Legend Refresh Map Layers GIS Data Help

- ### LAYERS
- All Layers
 - Base Map Layers
 - Management and Regulatory
 - SAFMC Gear Restrictions
 - SAFMC Essential Fish Habitat
 - Marine Sanctuaries
 - MARMAP Data
 - Unique Habitats
 - Coral HAPCs
 - SEAMAP Bottom Mapping
 - General Habitats
 - Estuaries
 - Imagery
 - 3D Bathymetry Image

Refresh Map

Auto Refresh

Legend Help

- ### OGC Backgrounds
- Visible
- MODIS RGB Composite(USF)
 - Optimal Interpolation SST (USF)
 - Optimal Interpolation SST legend
- Get MODIS RGB Timestamp
- Get OI SST Timestamp

Zoom In

Access the IMS at http://ocean.floridamarine.org/efh_coral/ims

GIS Data

- IMS Shortcut

http://ocean.floridamarine.org/efh_coral/ims/description_layers.htm

- provides a short description of each layer with links to metadata and zipped shapefiles
- access to Google Earth KMZ files

- SAFMC Mapping and GIS page

<http://www.safmc.net/EcosystemManagement/EcosystemBoundaries/MappingandGISData/tabid/632/Default.aspx>

- EFH
- EFH-HAPC
- Coral HAPCs
- Restricted Gear

GIS DATA

The South Atlantic Fishery Management Council in cooperation with the Fish and Wildlife Research Institute serves a variety of marine related data through the [Habitat and Ecosystem Internet Map Server \(IMS\)](#). This page provides a short description of each layer with links to Federal Geographic Data Clearinghouse (FGDC) compliant metadata and zipped files for download.

- [Base Map Description Layers](#)
- [Ocean Observing Systems](#)
- [Other Federally Managed Areas](#)
- [Management and Regulatory](#)
- [SAFMC Gear Restrictions](#)
- [SAFMC Essential Fish Habitat](#)
- [Marine Sanctuaries](#)
- [Unique Habitats](#)
- [Coral HAPCs](#)
- [SEAMAP Bottom Mapping](#)
- [General Habitats](#)
- [Estuaries](#)
- [Imagery](#)

The zipped shapefiles provided below can be uncompressed using shareware programs [Winzip](#) or [iZArc](#). ArcExplorer, a lightweight GIS data viewer, can be used to view these shapefiles. A free copy of [ArcExplorer](#) may be downloaded from the ESRI Web site.

Many GIS data layers served through this application have been converted to Google Earth files for easy viewing within the free Google Earth viewer. Google Earth requires an Internet connection. In order to view these files, you must have Google Earth installed on your computer. If you do not have Google Earth, you can download it from the [Google Earth web site](#). Google Earth requires an Internet connection, so if you do not have one, you will not be able to view these files. If you currently have Google Earth installed on your computer, you can simply click on the highlighted KMZ links below and choose "open" when prompted.

Be aware that larger KMZ files (particularly those greater than ~10MB and the Nautical Charts) ***can take a few moments to load.***

BASE MAP DESCRIPTION LAYERS

SAFMC GIS Data

Essential Fish Habitat

The Sustainable Fisheries Act of 1996, identifying the contribution of habitat loss and degradation on fishery declines, amended the Magnuson-Stevens Act to create a program to protect "essential fish habitat." The statute defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The legislation authorized a regulatory program to provide detailed identification of such habitat and obligatory consultation regarding all fishery and non-fishery activities receiving federal funding, permitting, or authorization that could impact EFH. The Council has taken the first step with the approval of the Habitat Plan identifying and describing in detail EFH for species managed throughout the South Atlantic and with the approval of the Comprehensive Habitat Amendment amending all existing FMPs to include descriptions of EFH and EFH-habitat areas of particular concern (EFH-HAPCs).

EFH for the SAFMC jurisdictional area INCLUDES:

Dolphin-Wahoo EFH	in progress	Zip File ~21kb
Shrimp EFH	Metadata	Zip File ~46 mb
Spiny Lobster EFH	Metadata	Zip File ~29 mb
Coastal Migratory Pelagics EFH	Metadata	Zip File ~5 mb
Golden Crab EFH	Metadata	Zip File ~51 kb
Snapper Grouper EFH	Metadata	Zip File ~65 mb
Coral, Coral Reefs, Live or Hard Bottom EFH	Metadata	Zip File ~4 mb

EFH-Habitat Areas of Particular Concern

Essential Fish Habitat (EFH) that is particularly important to the long-term productivity of populations of one or more managed species, or particularly vulnerable to degradation, should be identified as "habitat areas of particular concern" (HAPC) to help provide additional focus for conservation efforts. As a result of the Sustainable Fisheries Act Amendment to the Magnuson-Stevens Fishery Conservation and Management Act in 1996 the Councils and the NMFS have been mandated to use an ecosystem approach in managing the Nation's Fisheries. The Council took the first step with the approval of the Habitat Plan identifying and describing in detail EFH for species managed throughout the South Atlantic and with the approval of the Comprehensive Habitat Amendment amending all existing FMPs to include descriptions of EFH and EFH-HAPCs. Due to their important ecological function, areas of the offshore pelagic environments discussed above and the associated benthic habitats represent EFH-HAPCs and were designated as such through previous Council actions.

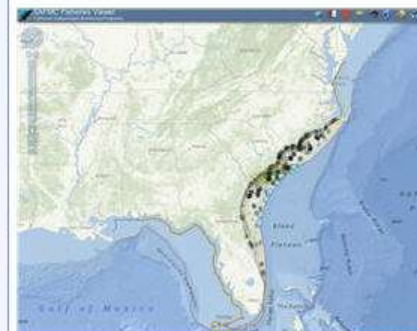
EFH-HAPCs INCLUDE:

HABITAT	METADATA	SHAPEFILE	GOOGLE EARTH
---------	----------	-----------	--------------



SAFMC Fisheries

This prototype application displays fishery independent data collected by the SEAMAP - South Atlantic (SA) component and by the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) program. The application also contains several base layers and data from EcoGIS.



SAFMC EFH

This prototype application displays Essential Fish Habitat (EFH) and Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) for several species under SAFMC's jurisdiction. It also displays EFH for Highly Migratory Species (HMS) managed by NOAA Fisheries.

Phase 2 – Habitat and Ecosystem Homepage

- Design and develop a framework for the “Comprehensive Habitat and Fishery Ecosystem Plan” homepage
- Iterative process for establishing layout and taxonomy
- Traditional HTML and JavaScript



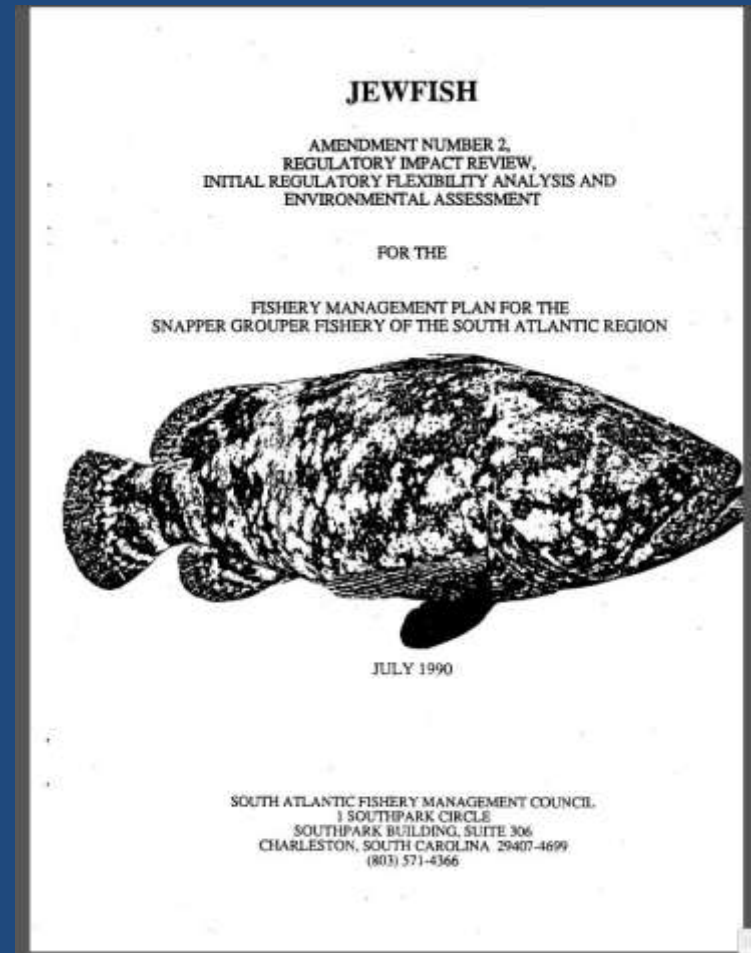
Phase 2 – Habitat and Ecosystem Homepage

Document Conversion

FWRI scanned a variety of historic and recent documents for inclusion in the site. Example documents include:

- Comprehensive Amendment Addressing Sustainable Fishery Act,
- Amendment 2 to the FMP for Coral and Coral Reefs of the Gulf and South Atlantic,
- FMP of the Snapper Grouper Fishery of the South Atlantic, and
- Developmental Patterns within a Multispecies Reef Fishery: Management Applications for Essential Fish Habitats and Protected Areas.

Over 300 documents were scanned during phases two and three.



Phase 2 Issues

- Chaotic process
- Questions about security and scalability
- Difficult to update and maintain

Phase 3 - transition homepage to a Portal application

- Transition homepage to a Portal application
- Address Security issues
- Provide user groups and administrators security based roles
- Implement file sharing and uploading
- Grant SAFMC staff privileges to edit or create pages as necessary
- Facilitate development of the Fishery Ecosystem Plan

Portal Software

- **Open Source** product : DotNetNuke
- built on a Microsoft ASP.NET platform
- SQL Server backend (can also use MySQL)
- Modular Design – easily add modules for contacts, calendar of events, discussions, forums, FAQs, links, image galleries, etc.
- Web-based interface for anytime, anywhere updates



SAFMC Comprehensive Habitat and Fishery Ecosystem Plan

[EFH](#) [Habitats](#) [EcoPath](#) [Partners](#) [GIS Data](#) [About Us](#)

Moving towards Ecosystem-based Management

From deepwater canyons off the Carolinas to the shallow tropical waters surrounding the Florida Keys, marine habitats found in the South Atlantic region are as diverse as the species that inhabit them. The South Atlantic Council is at the forefront of habitat conservation and fishery management through three broad efforts:

- Adoption of a proactive approach to protect and enhance Essential Fish Habitat (EFH) for all managed species under its jurisdiction
- Adoption of precautionary and proactive management plans
- Increasing application of an ecosystem-based approach to fisheries management in the South Atlantic region

Ultimately, by broadening the scope of management, the Council will achieve long-term sustainability of fisheries and of the ecosystem as a whole.

With the [Habitat Plan](#) as a cornerstone, the South Atlantic Fishery Management Council is developing an ecosystem-based approach to resource management. Evolution of the Habitat Plan into a Fishery Ecosystem Plan (FEP), and transition from single species management to **ecosystem-based management**, will require a greater understanding of the South Atlantic light ecosystem, and the complex relationships among humans, marine life and essential fish habitat.

The [Habitat Plan](#) presents a snapshot of the biological, social and economic characteristics of South Atlantic light ecosystem from the headwaters of the river systems to off the Continental Shelf.

The Fishery Ecosystem Plan updates, expands and relates species, habitat (EFH and EPH-EAPCs) and fishery information to include available biological, social and economic information. The FEP specifies research and monitoring needed to fully address ecosystem-based management. The FEP will also support a Comprehensive Amendment and Environmental Impact Statement for all Fishery Management Plans (FMP).

Ultimately, the FEP will:

1. Define the geographical boundaries of the ecosystem, including characterization of its biological, chemical and physical dynamics;
2. Assess ecological, human and institutional elements of the ecosystem;
3. Develop a conceptual model of the food web;
4. Describe the habitat needs of different life history stages for all managed species;
5. Calculate and characterize total removals (i.e., bycatch, discards, bycatch);
6. Develop indices of ecosystem health;
7. Establish long-term monitoring;
8. Develop appropriate management including catch limits, gear regulations, zoning, etc.

We invite you to [contact us](#) with your ideas, questions, and suggestions.



Deep-sea coral habitats are becoming increasingly recognized for their value as unique fish habitat and high biodiversity.

Related Documents

• [Ecosystem-Based Fishery Management](#)

A report to Congress by the Ecosystems Principles Advisory Panel

• [A Habitat-Coral Reef Action Strategy](#)

Report to Congress by NOAA

• [The Ecosystem Supervision Framework](#)

FAO Fisheries Technical Paper



For more information:

Contact
Roger Engler

rom.engler@safrmc.net

Before



Home Ecosystem Management Map Catalog Habitat Management Ecosystem Library

Thursday, October 13, 2005

[Home](#)

Search Register Login

Quick Links

[Mapping and GIS Data](#)

[Deep Water Corals](#)

[Sargassum](#)

[Protected Species](#)

[Ecosystem Linkages](#)

[Fishery Management Plans](#)

[Glossary](#)

[Partners](#)

[About Us](#)

Moving Towards Ecosystem Management

From deepwater canyons off the Carolinas to the shallow tropical waters surrounding the Florida Keys, marine habitats of the South Atlantic are as diverse as the species that inhabit them. To address this diversity, the South Atlantic Council is adopting an ecosystem approach to fisheries management with the development of a Fishery Ecosystem Plan and Comprehensive Ecosystem Amendment that will amend all the Council's Fishery Management Plans. The South Atlantic Council continues to be at the forefront of habitat conservation and risk-averse management through:



- Adoption of a proactive approach to protect and enhance Essential Fish Habitat for all managed species under its jurisdiction
- Adoption of precautionary and proactive management plans

Ultimately, by broadening the scope of management, the Council will achieve long-term sustainability of fisheries and of the ecosystem as a whole (Photo credit: NURC/UNCW).

The Fishery Ecosystem Plan will evolve from the Council's [Habitat Plan](#). The transition from single species management to **ecosystem management**

will involve incremental steps to better characterize the system and understand the complex relationships among humans, harvested fish and prey, all marine life and essential habitat and environmental characteristics of the South Atlantic Ecosystem. This effort will provide the Council with a foundation from which to attain a more comprehensive understanding of habitat and biology of species, fishery information, social and economic impacts of management and ecological consequences of conservation and management. The Fishery Ecosystem Plan will specify research and monitoring needed to fully address ecosystem management.

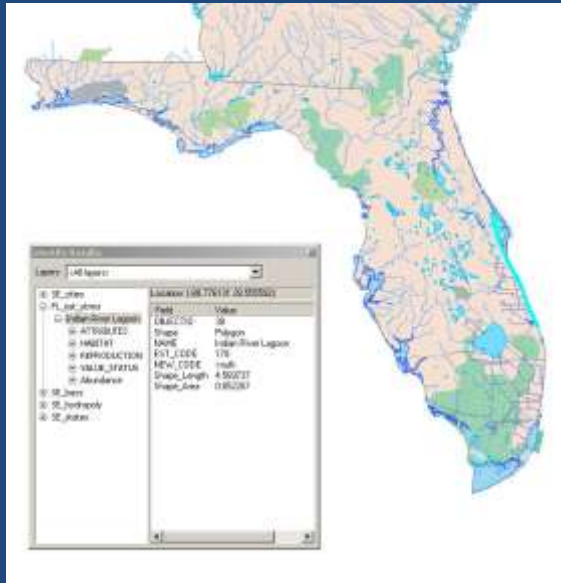
Building on the recommendations outlined in the [Ecosystem Report to Congress](#), the Council's Fishery Ecosystem Plan and Comprehensive Ecosystem Amendment will include the following:

1. Define the **ecosystem boundaries**;
2. Characterize the **ecological** (biological, chemical and physical), **human** and **institutional** elements of the ecosystem;
3. Describe the **habitat** needs of different life history stages for all **managed species**;
4. Develop a conceptual model of the **food web**;
5. Calculate and characterize total **fishery removals** (i.e., landings, discards, bycatch);
6. Develop indices of **ecosystem health**;
7. Recommend research and monitoring activities (**Council FMP needs, gearable databases, federal and state programs, ocean observing systems/fisheries oceanography**);
8. Develop appropriate **management** such as catch limits, gear regulations and **area management**.

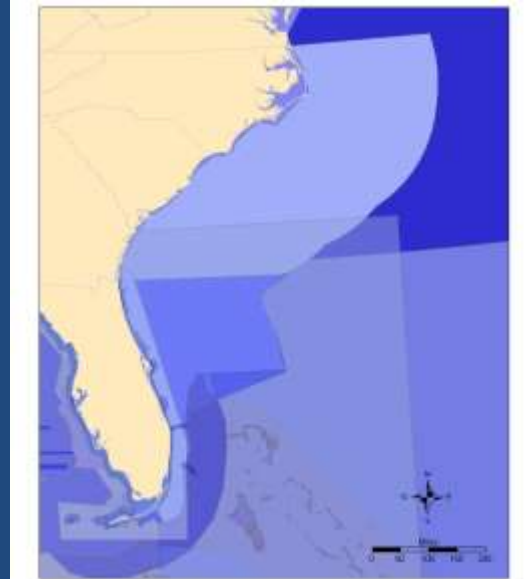
Copyright (c) 2005 South Atlantic Fisheries Management Council. Terms of Use Privacy Statement

After

Phase 4 – EcoSpecies, EcoResearch and GeoPDFs



EcoSpecies Data Tables



EcoResearch footprints



GeoPDFs

EcoSpecies

- geospatially enabling the Florida Estuarine Marine Living Resources (FLEMLR) database
 - FWRI collaboration with NOAA to develop a more Florida-specific ELMR System
- could be used to eventually integrate spawning or distribution information into SEDAR stock assessments

Indian River Lagoon

Selected Attributes of FL_est_strms							Restore Default Column Widths				
OBJECTID	Shape	NAME	EST_CODE	HEW_CODE	Shape_Length	Shape_Area					
38	Polygon	Indian River Lagoon	170	<Null>	4.569737	0.052					

Selected Attributes of ATTRIBUTES											
OBJECTID	FLELMR_EST_CODE	FLELMR_CODE	LIFE_STAGE	EPIBENTHIC	BENTHIC	DEMERSAL	HEKTONIC	PLANKTONIC	LIFE_MODE_UNKNOWN	FRESHWATER_RESIDENT	ESTUARINE_RESIDENT
836	Indian River Lagoon	jewfish	L	0	0	0	0	1	0	0	0
837	Indian River Lagoon	jewfish	E	0	0	0	0	1	0	0	0
838	Indian River Lagoon	red grouper	A	0	0	1	1	0	0	0	0
839	Indian River Lagoon	red grouper	S	0	0	1	1	0	0	0	0
840	Indian River Lagoon	red grouper	J	0	0	1	1	0	0	0	0
841	Indian River Lagoon	red grouper	L	0	0	0	0	1	0	0	0
842	Indian River Lagoon	red grouper	E	0	0	0	0	1	0	0	0
843	Indian River Lagoon	mutton snapper	A	0	0	1	0	0	0	0	0
844	Indian River Lagoon	mutton snapper	S	0	0	1	1	0	0	0	0
845	Indian River Lagoon	mutton snapper	J	0	0	1	0	0	0	0	0
846	Indian River Lagoon	mutton snapper	L	0	0	0	1	1	0	0	0
847	Indian River Lagoon	mutton snapper	E	0	0	0	0	1	0	0	0
848	Indian River Lagoon	lane snapper	A	0	0	1	1	0	0	0	0
849	Indian River Lagoon	lane snapper	S	0	0	1	1	0	0	0	0
850	Indian River Lagoon	lane snapper	J	0	0	1	1	0	0	0	0
851	Indian River Lagoon	lane snapper	L	0	0	0	0	1	0	0	0
852	Indian River Lagoon	lane snapper	E	0	0	0	0	1	0	0	0
928	Indian River Lagoon	snook	A	0	0	1	1	0	0	0	0
929	Indian River Lagoon	snook	E	0	0	0	0	1	0	0	0
930	Indian River Lagoon	snook	J	0	0	1	1	0	0	1	0
931	Indian River Lagoon	snook	L	0	0	0	0	1	0	0	0
932	Indian River Lagoon	snook	S	0	0	0	1	0	0	0	0
933	Indian River Lagoon	spotted seatrout	A	0	0	1	0	0	0	0	0
934	Indian River Lagoon	spotted seatrout	E	0	0	0	0	1	0	0	0
935	Indian River Lagoon	spotted seatrout	J	0	0	1	1	0	0	0	0
936	Indian River Lagoon	spotted seatrout	L	0	0	1	0	1	0	0	0
937	Indian River Lagoon	spotted seatrout	S	0	0	0	1	0	0	0	0
938	Indian River Lagoon	red drum	A	0	0	0	1	0	0	0	0
939	Indian River Lagoon	red drum	E	0	0	0	0	1	0	0	0
940	Indian River Lagoon	red drum	J	0	0	0	1	1	0	0	0
941	Indian River Lagoon	red drum	L	0	0	0	0	1	0	0	0
942	Indian River Lagoon	red drum	S	0	0	0	1	0	0	0	0
947	Indian River Lagoon	Alabama shad	E	0	0	0	0	1	0	1	0
951	Indian River Lagoon	Alabama shad	L	0	0	0	0	1	0	1	0
955	Indian River Lagoon	Alabama shad	<Null>	0	0	0	0	0	0	0	0
956	Indian River Lagoon	Alabama shad	S	0	0	0	0	0	0	0	0
962	Indian River Lagoon	Alabama shad	A	0	0	0	1	0	0	1	0
963	Indian River Lagoon	bonnethead shark	<Null>	2	2	2	2	2	2	2	2

Record: 1 | Show: All Selected | Records (271 out of 1108 Selected) | Options

Ecospecies Issues

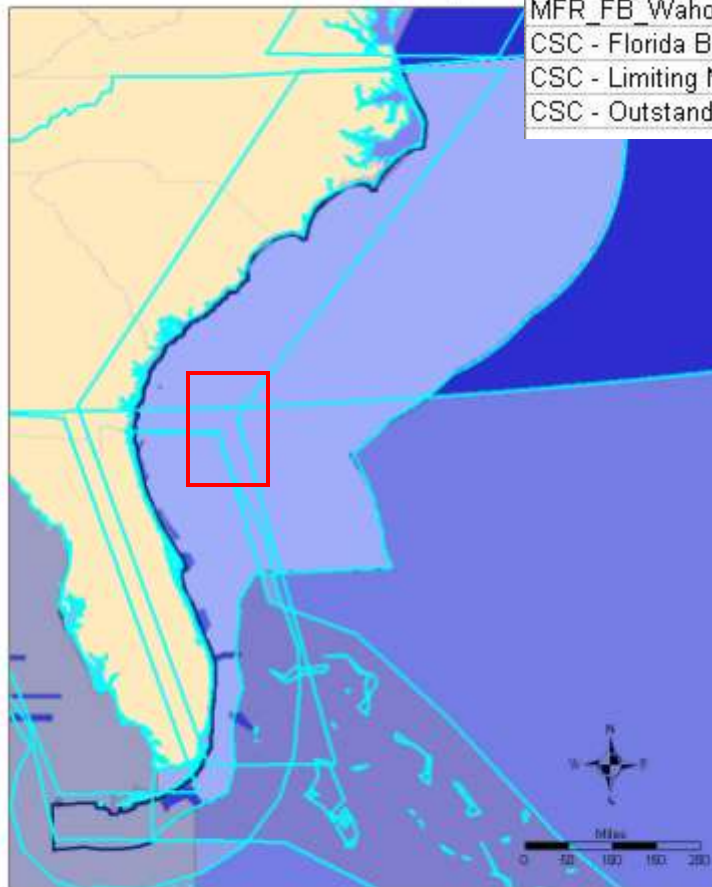
- Only 4 estuaries populated with Species Life History profiles :
 - **Florida Bay,**
 - Tampa Bay,
 - Sarasota Bay,
 - **Indian River Lagoon**
- Not Comprehensive for the Region
- ArcIMS identify or query tools would not display the domains or relationships established within the geodatabase.
- Lack of confidence for data quality.

EcoResearch Database

- will provide a catalogue of relevant ecosystem research in the South Atlantic region
- designed to determine science information needs and potential data gaps occurring in SAFMC's jurisdiction
- serve the spatial footprints of the EcoResearch Database as a GIS layer in the IMS application

NAME	RECORD_ID
CSC - Florida Manatee Sanctuary Act	78728182252765184
USF - SeaWiFS Sea Surface Temperature	78743990331179008
NOAA - Estuarine Living Marine Resources (ELMR)	78728131240198144
AOML - ENVIDS Atlantic Tropical Storm Tracking by Year and Storm	78728130748350464
NRL - Intra-Americas Sea Ocean Nowcast/Forecast System	78743996577284096
WR_MTR_sea turtle Florida statewide nesting beach survey 1979- present	77322836872986624
WR_MTR Florida Sea Turtle Stranding and Salvage Network (1986-2004)	77725981517807616
WR_MTR_sea turtle Florida sea turtle stranding and salvage network	77322836640137216
MFR_FB_Wahoo_Life History	77322672112402432
CSC - Florida Boating Restricted Areas	78728182032236544
CSC - Limiting Marine Net Fishing in Florida	78728182143778816
CSC - Outstanding Florida Waters	78728182350807040

EcoResearch Footprints



Record Title: Florida Sea Turtle Stranding and Salvage Network, Stranding Locations, 1986-2004

[Full Metadata](#)

Originator: Florida Fish and Wildlife Conservation Commission-Fish and Wildlife Research Institute-Marine Turtle Program

[Browse Graphic](#)

Abstract: Coordinated by the Florida Fish and Wildlife Conservation Commission - Fish and Wildlife Research Institute (FWRI), the Florida Sea Turtle Stranding and Salvage Network (STSSN) is responsible for gathering standardized data on stranded marine turtles throughout the state. The Florida STSSN functions as a part of an eighteen state network led by NOAA's National Marine Fisheries Service (NMFS). In Florida, strandings are documented by FWRI staff biologists and by a network of permitted participants located around the state. Live strandings are rescued and transported to properly permitted rehabilitation facilities. Data from strandings are collected on a standardized reporting form and include date, species, location, carapace length and width, carcass condition, carcass disposition, and information on anomalies (e.g., entanglement, propeller damage, fibropapillomas). Additionally, certain carcasses are regularly collected by FWRI staff for gross or detailed necropsy. Each week, FWRI reports Florida strandings to NMFS as a part of a management plan that is intended to reduce the incidental take of turtles in the shrimp fishery. FWRI also generates monthly and yearly stranding summary reports to monitor mortality and to detect and describe any unusual stranding events. Stranding data collected through the Florida STSSN have been used extensively in the identification of mortality factors and in the development of recovery actions (e.g., Turtle Excluder Device (TED) requirements, gill net regulations).

Purpose: The purpose is to monitor marine turtle mortality and identify mortality factors in Florida by documenting stranded marine turtles.

Start Date: 1986

End Date: 2004

Status - Progress: Complete

Status - Update: As needed

Contact:

Contact Organization:

Contact E-mail:

[Data](#)

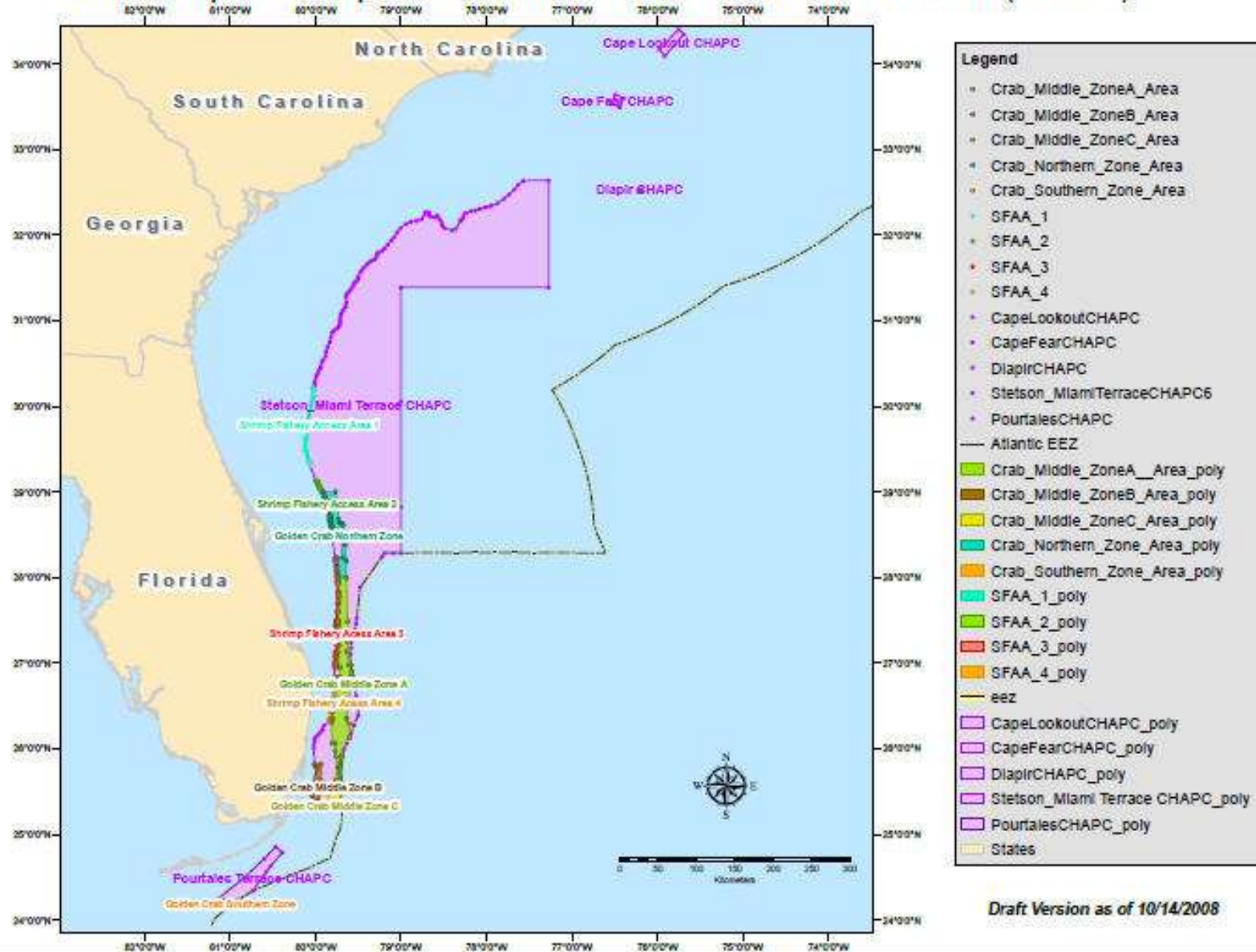
Phase 4 – GeoPDF

- MAP2PDF (now called TerraGo) software
 - publish and distribute spatially aware maps with no need for the recipients of the GeoPDF to have any knowledge of GIS.
- Clients only need the free GEOPDF toolbar to access the extended PDF tools.
- GEOPDF delivers complex layered mapping data in a single portable document.

GeoPDF

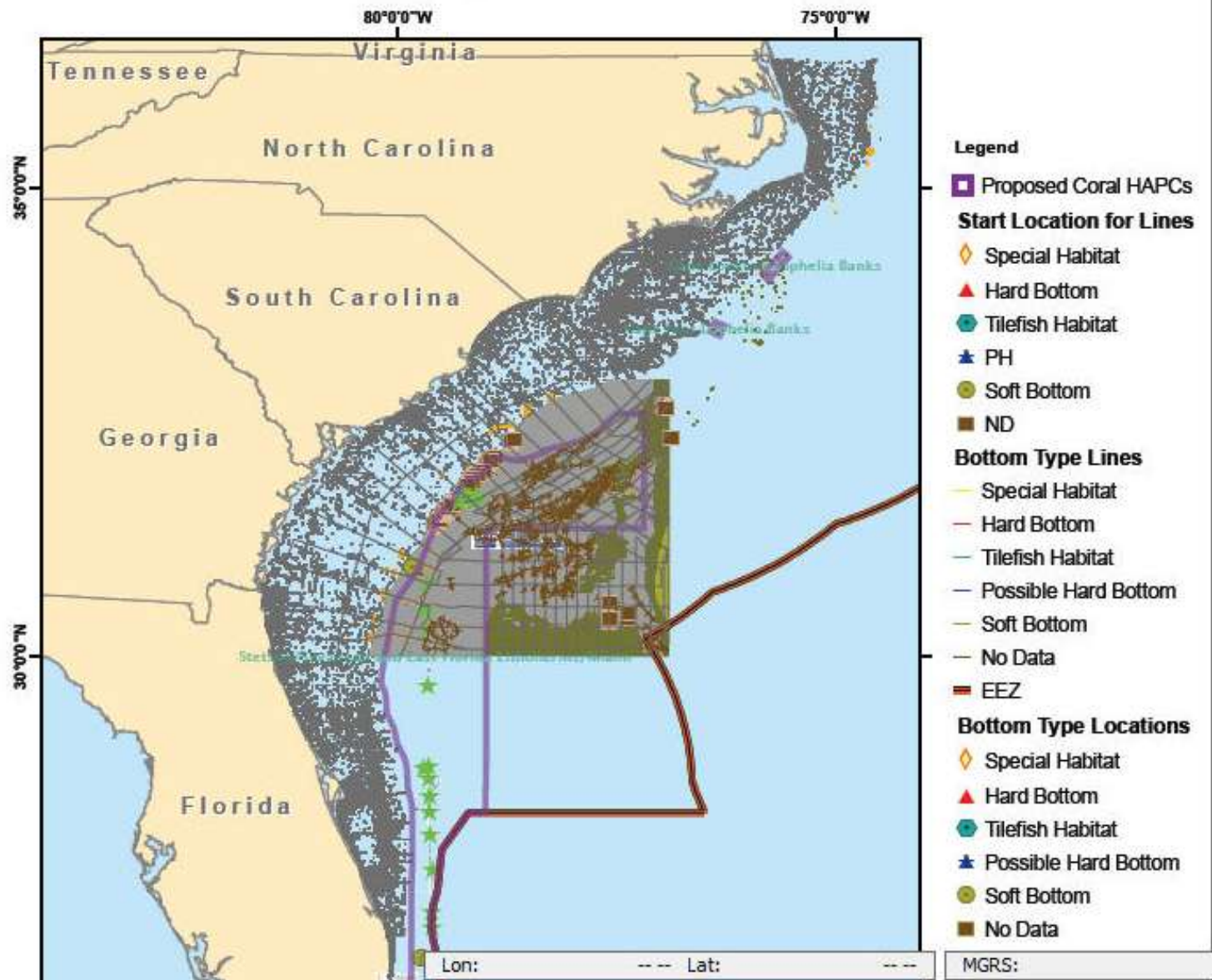
- Automatic embedding of coordinate systems within PDF files
- Display of coordinates in alternate projections and Datums
- Displays point, line and area attributes of map objects with query capabilities
- Displays map coordinates in lat/long, utm or x/y
- Allows for zoom to points and objects by coordinates
- Displays locations and tracks from GPS units
- Maintains layers within maps
- Allows for measuring of distance, area, bearing and azimuth
- Allows users to print to any desktop printer
- Users just download the free GeoPDF toolbar.
- Leverages Adobe tools most people already have installed and know how to use

SAFMC Proposed Deepwater Coral Habitat Area of Particular Concern (CHAPC)



Draft Version as of 10/14/2008

Distribution of Bottom Habitat Information for the South Atlantic Bight



Phase 5 -Transition to ArcGIS Server

- Although the IMS application is still a useful tool, the technology for online mapping is changing!
- The ArcIMS software will not be available after the current release version of 10.0
- ArcGIS Server (AGS) is now the recommended software for distributing and sharing GIS data and map products on the web.
- The transition to the AGS platform, will enhance SAFMC's online suite of tools to support fisheries management in their region.

ArcGIS Server Benefits

- leverages FWRI's hardware, software and personnel
- reduces software deployment costs for SAFMC
- disseminates the geographic knowledge needed to improve decision making
- promotes SAFMC ecosystem data in the form of shared maps



Image source: ESRI

Phase 6 – Create map services and develop .NET ADF web applications

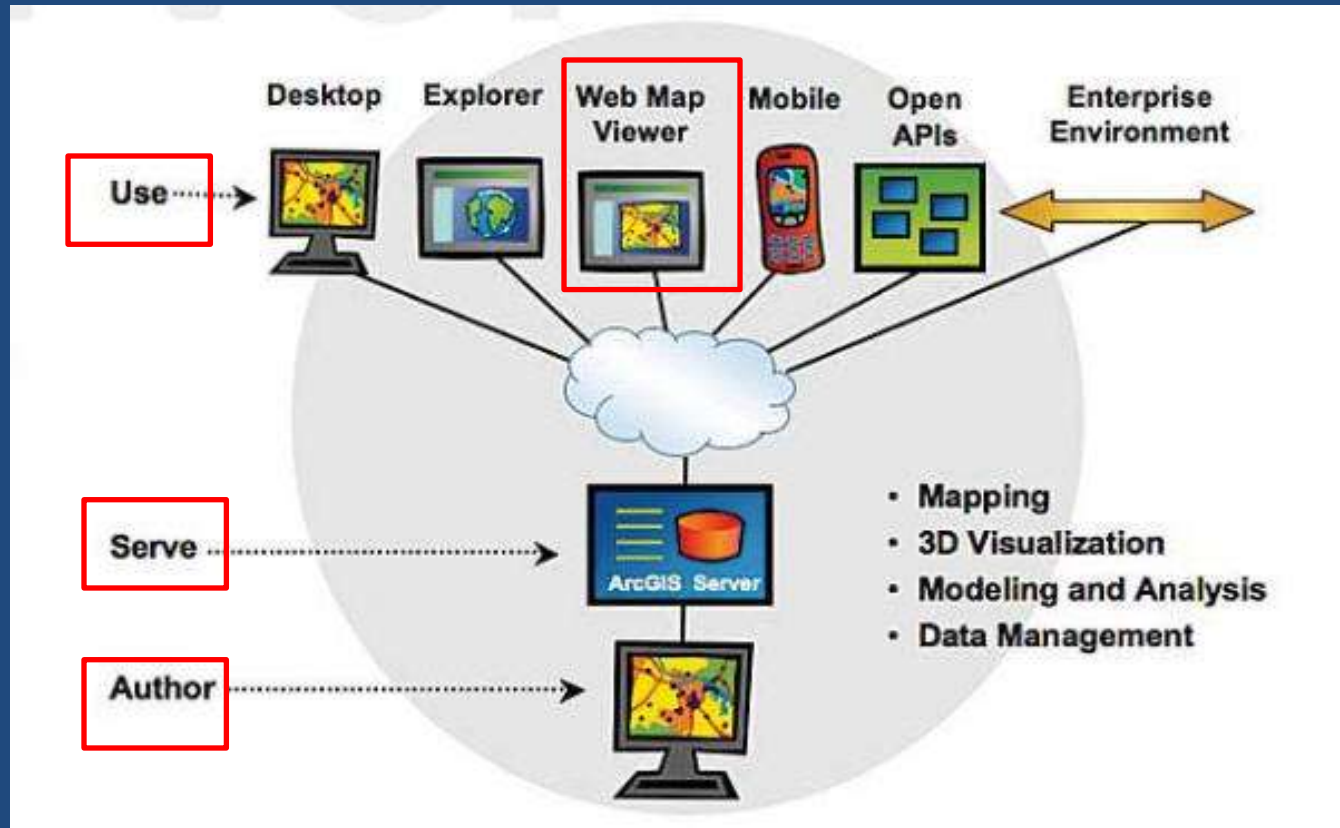


Image source: ESRI

What is a map service, anyway?

- A map service makes maps, features, and attribute data available inside many types of client applications:
 - Web applications – **.NET Web ADF, Flex**, Silverlight, JavaScript
 - ArcMap, ArcView
 - ArcGIS Explorer (Free!)
 - Mobile Devices (iPhone, Android devices)
 - Google Earth (as KML)
 - OGC platforms (as WMS or WFS)



GIS layers available through the
SAFMC Fishery Service (167 layers)

ArcGIS Services Directory

[Home](#) > [SAFMC Fishery \(MapServer\)](#) > [Catch Data](#)

Layer: Catch Data (ID: 3)

Parent Layer: [SEAMAP-SA Data](#)

Display Field: COMMON_NAM

Type: Feature Layer

Geometry Type: esriGeometryPoint

Description: This GIS data set represents catch by trawl information from the SEAMAP-SA database for all species.

Definition Expression:

Copyright Text:

Min. Scale: 0

Max. Scale: 0

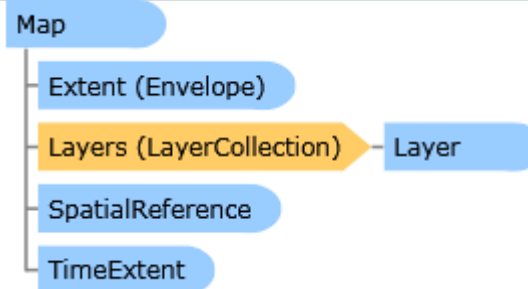
Extent:

XMin: -81.4501
YMin: 28.756
XMax: -75.57
YMax: 35.85
Spatial Reference: 104199

Fields:

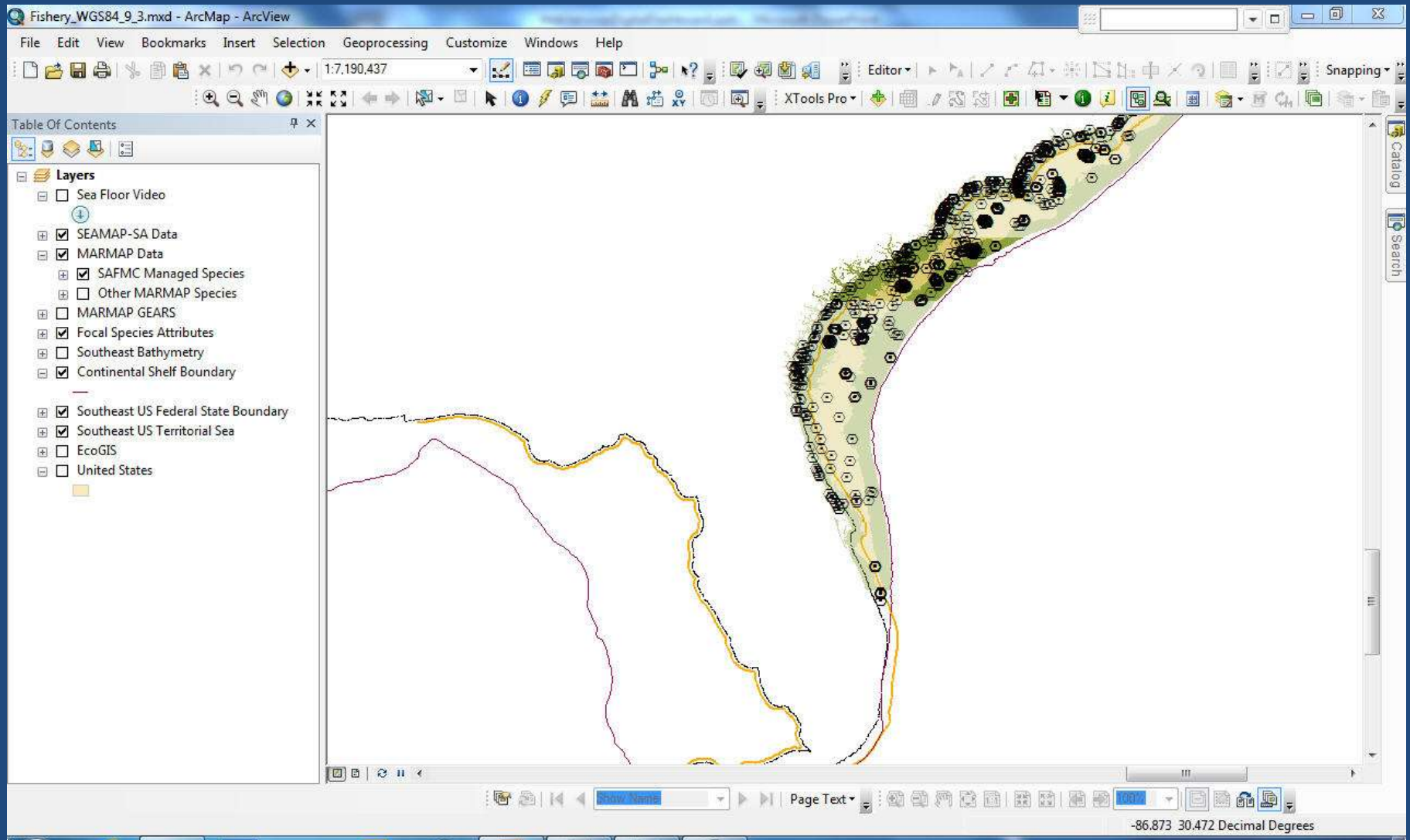
- FID (Type: esriFieldTypeOID, Alias: FID)
- Shape (Type: esriFieldTypeGeometry, Alias: Shape)
- LATITUDEST (Type: esriFieldTypeDouble, Alias: Latitude)
- LONGITUDES (Type: esriFieldTypeDouble, Alias: Longitude)
- DATE (Type: esriFieldTypeDate, Alias: Date)
- EVENT (Type: esriFieldTypeString, Alias: Event)
- COLLECTION (Type: esriFieldTypeString, Alias: Collection)
- SPECIESCOD (Type: esriFieldTypeString, Alias: Species Code)
- COMMON_NAM (Type: esriFieldTypeString, Alias: Common Name)
- NUMBERTOTA (Type: esriFieldTypeDouble, Alias: Total Number)
- SPECIESTOT (Type: esriFieldTypeDouble, Alias: Total Weight (kg))

Supported Operations: [Query Layer](#)



Descriptive information for the SEAMAP-SA Catch Data layer

Phase 6 – Create map services



All map services begin inside ArcMap where you create your map

SAFMC Map Services

Essential Fish Habitat (EFH) – displays EFH and EFH-HAPCS for SAFMC managed species and NOAA Fisheries Highly Migratory Species

Fisheries - displays Marine Resources Monitoring, Assessment, and Prediction (MARMAP) and Southeast Area Monitoring and Assessment Program South Atlantic (SEAMAP-SA) data .

Managed Areas - displays a variety of regulatory boundaries (SAFMC and Federal) or management boundaries within SAFMC's jurisdiction.

Habitat – displays habitat data collected by SEADESC, Harbor Branch Oceanographic Institute (HBOI) and Ocean Exploration dives, as well as the SEAMAP shallow and ESDIM deepwater bottom mapping projects, multibeam imagery, and scientific cruise data.

Multibeam Bathymetry - displays a variety of multibeam data sources and scanned bathymetry charts

Nautical Charts – displays coastal, general, and overview nautical charts for the SAFMC's jurisdictional area

.NET ADF web application

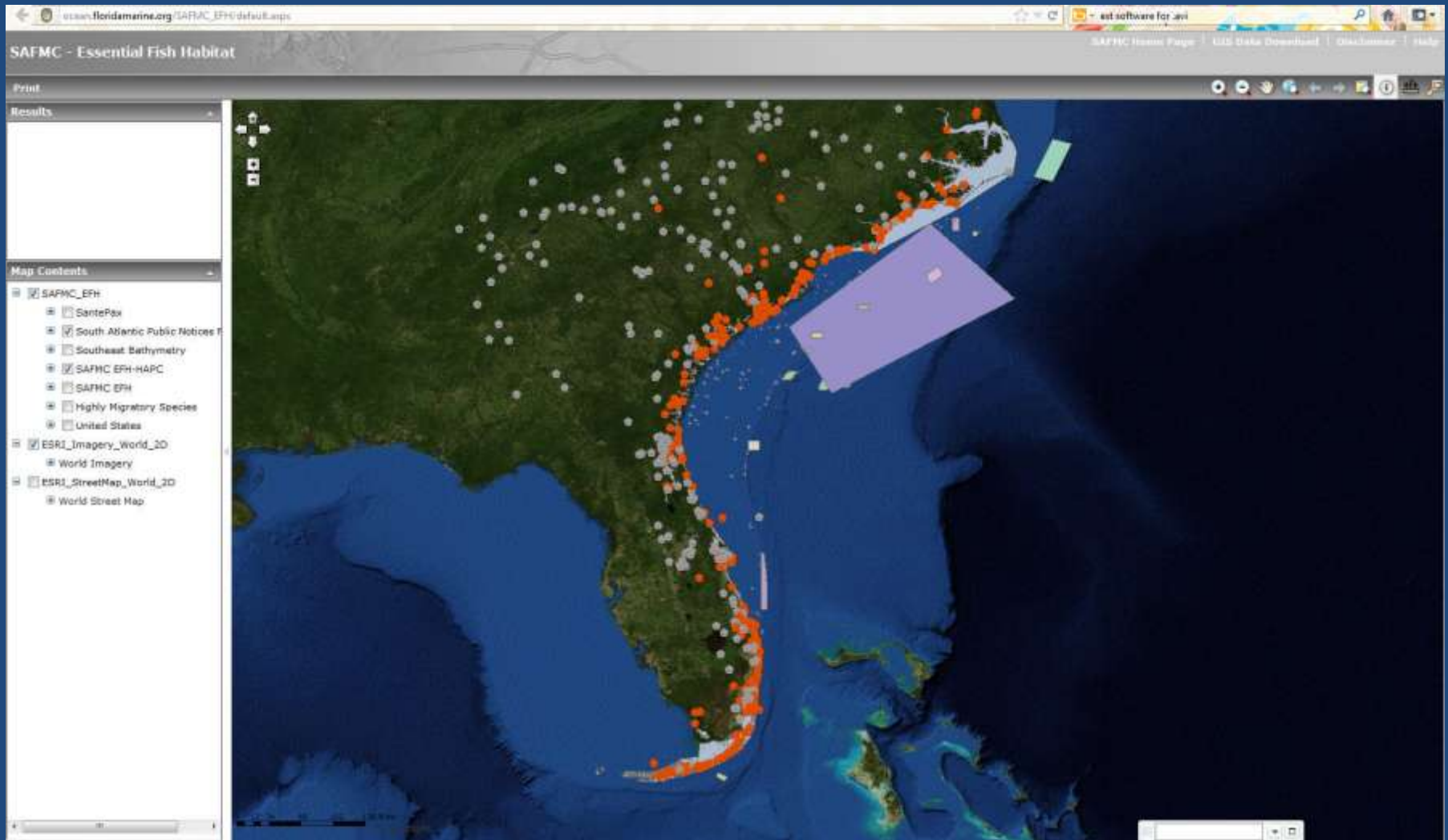
PROS

- Simple to develop with menu driven interface
- Easy to add GIS capabilities, no coding required

CONS

- Difficult to update, customized queries lost easily
- Slow to draw initial map
- Will be ***deprecated at next software release***

.NET Web ADF



The SAFMC Essential Fish Habitat application is displaying the Snapper Grouper EFH-HAPC, and the South Atlantic Public Notices 2011. http://ocean.floridamarine.org/SAFMC_EFH/default.aspx

.NET Web ADF

Firefox | http://ocean.floridamarine.org/safmc_fisheries/

ocean.floridamarine.org/safmc_fisheries/ | Bing

Web Mapping Application | ESRI | ESRI Support Center | Help

Print

Results

Map Contents

- SAFMC_Fishery
 - Sea Floor Video
 - SEAMAP-SA Data
 - MARMAP Data
 - MARMAP GEARS
 - Focal Species Attributes
 - Southeast Bathymetry
 - Continental Shelf Boundary
 - Maritime Limits United States
 - EcoGIS
 - United States
- ESRI_Imagery_World_2D
 - World Imagery
- ESRI_StreetMap_World_2D
 - World Street Map

<http://secoora.org/#>

Copyright

Web Mapping Applications

.NET Web ADF

- customized **tasks** to query specific GIS data layers
- Zoom, pan and identify tools
- ArcWeb Services to display cached base maps
- print capabilities
- Measuring tools
- and **quick links** to SAFMC.net, help pages, and GIS data

ArcGIS Viewer for Flex

- customized **widgets** to query specific GIS data layers
- Zoom, pan and identify tools
- ArcWeb Services to display cached base maps
- print capabilities
- Measuring tools
- **Splash page** for overview of data and sources



Phase 7 – transfer web applications to Flex Viewer

- improve accessibility and performance by incorporating Flex technology for SAFMC web applications

ArcGIS Viewer for Flex

- Precompiled and ready to deploy
- Easy to add data or tools
- Many custom widgets available
- Intuitive and responsive interface
- Requires flash player (98% PCs already have)

Adobe Flash Player PC Penetration

Worldwide Adobe Flash Player penetration

	June 2008	September 2008	December 2008	March 2009
Total number of PCs using the Internet worldwide (IDC) ¹	904 million	915 million	958 million	1.01 billion
Percentage who can view Flash Player content version 7 and higher worldwide ²	98.4%	98.1%	99.0%	98.9%
Worldwide Adobe Flash Player penetration - estimate ³	890 million	898 million	947 million	1 billion

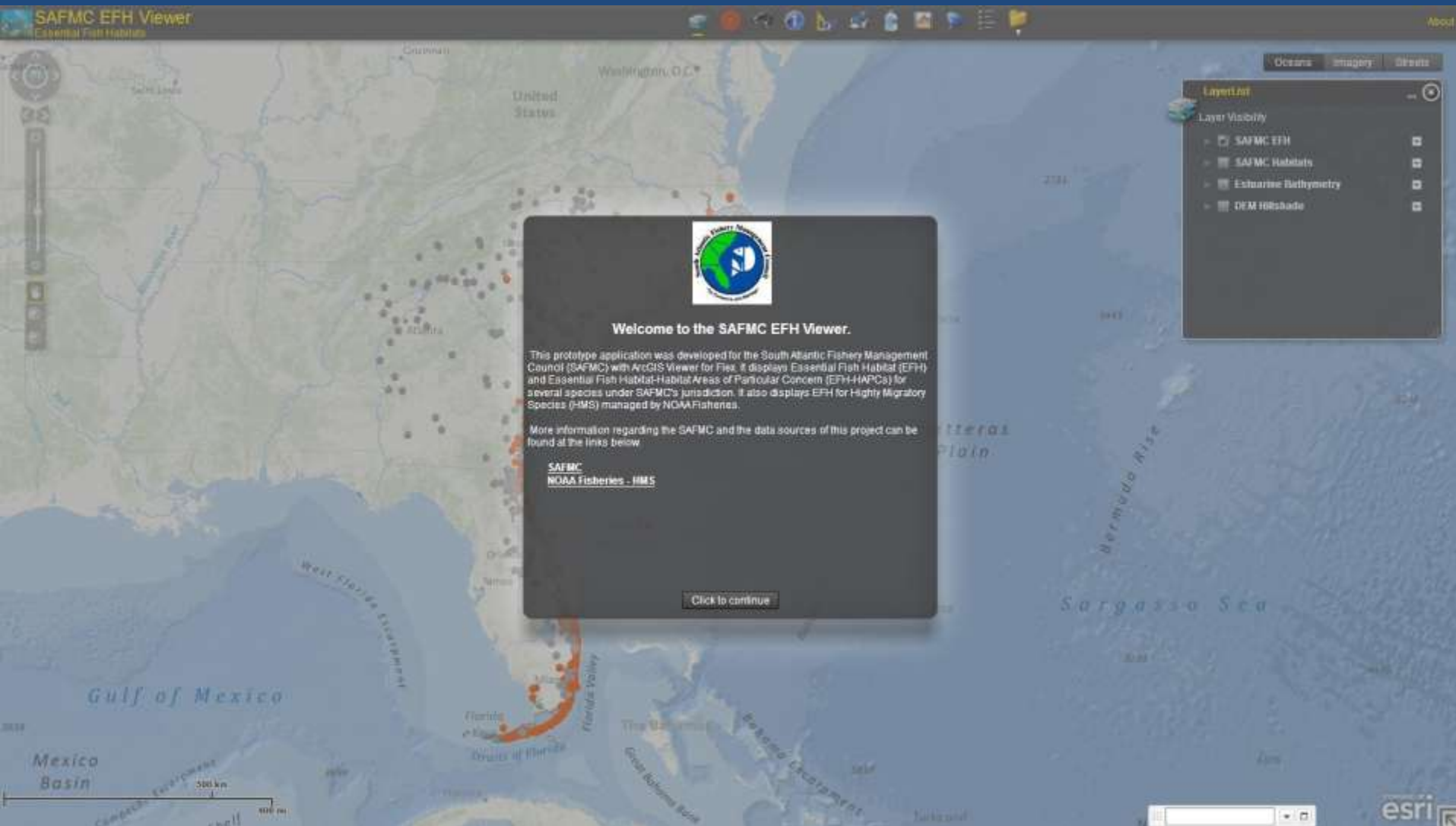
Notes

1. Forecasted number of PCs using the Internet - IDC Digital Marketplace Model and Forecast, December 2008
2. Weighted average percentage of mature and emerging markets.
3. Total Player penetration is a calculation of the total number of PCs connected to the internet, multiplied by the weighted percentage of worldwide penetration from the Millward Brown study. This is an assumption made by Adobe.

SAFMC Essential Fish Habitat

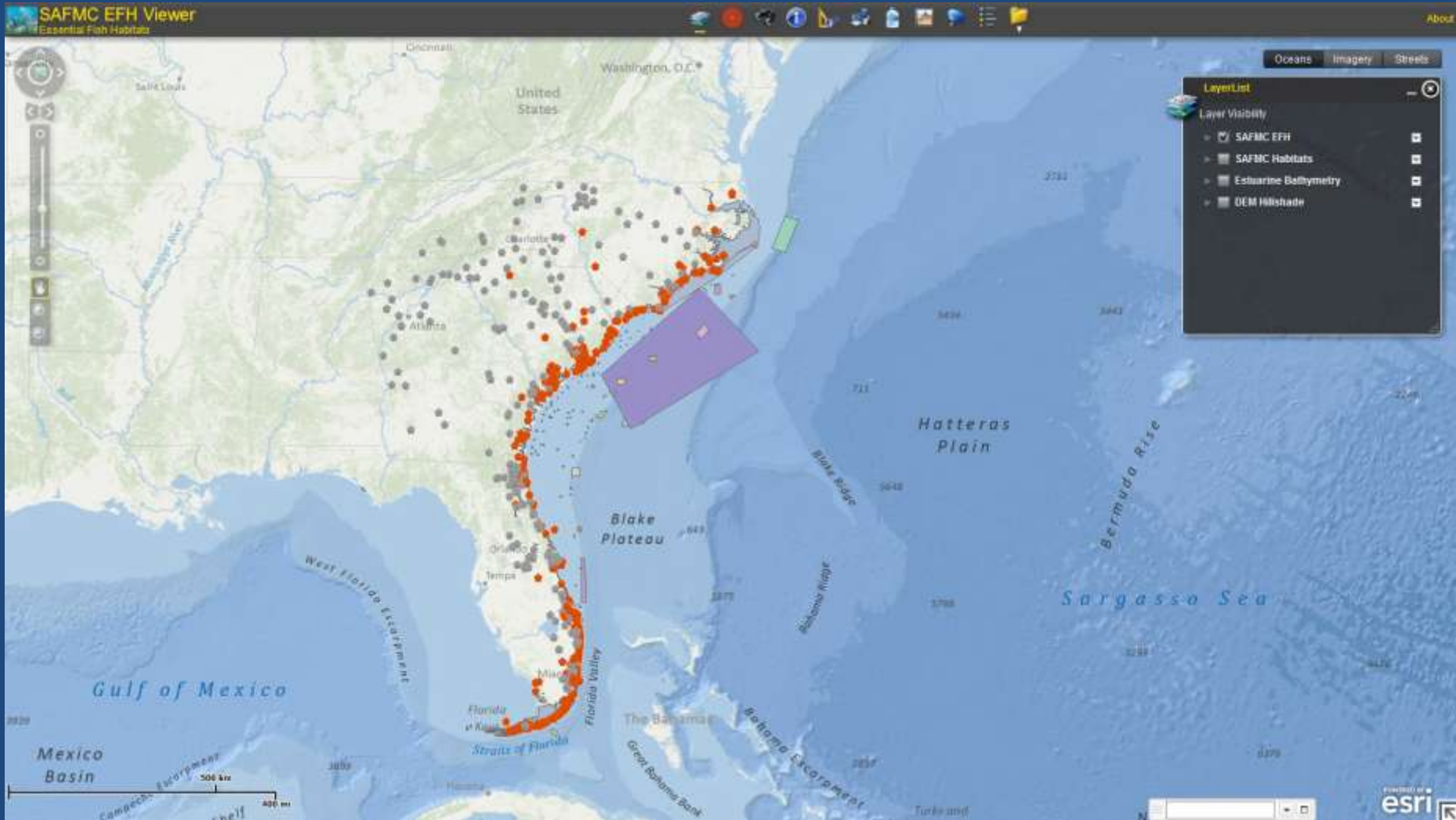
- contains EFH and EFH-HAPC data layers for species managed by the SAFMC.
- also includes NOAA Fisheries Highly Migratory Species
 - Atlantic Tunas
 - Sharks
 - Sailfish
 - Sword Fish
 - Blue or White Marlins

ArcGIS Viewer for Flex



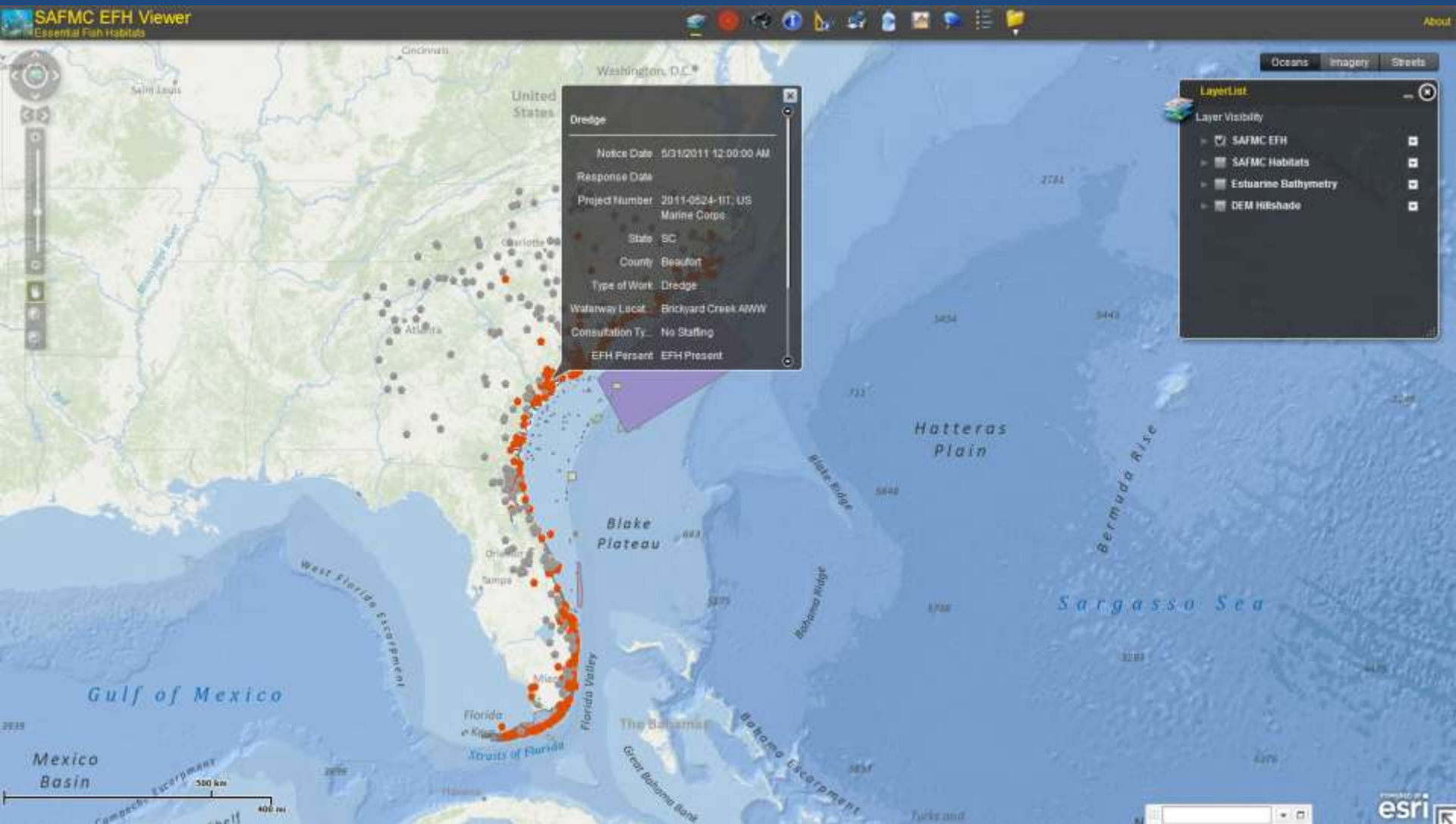
SAFMC EFH Viewer is accessible via http://ocean.floridamarine.org/sa_efh

SAFMC EFH Viewer

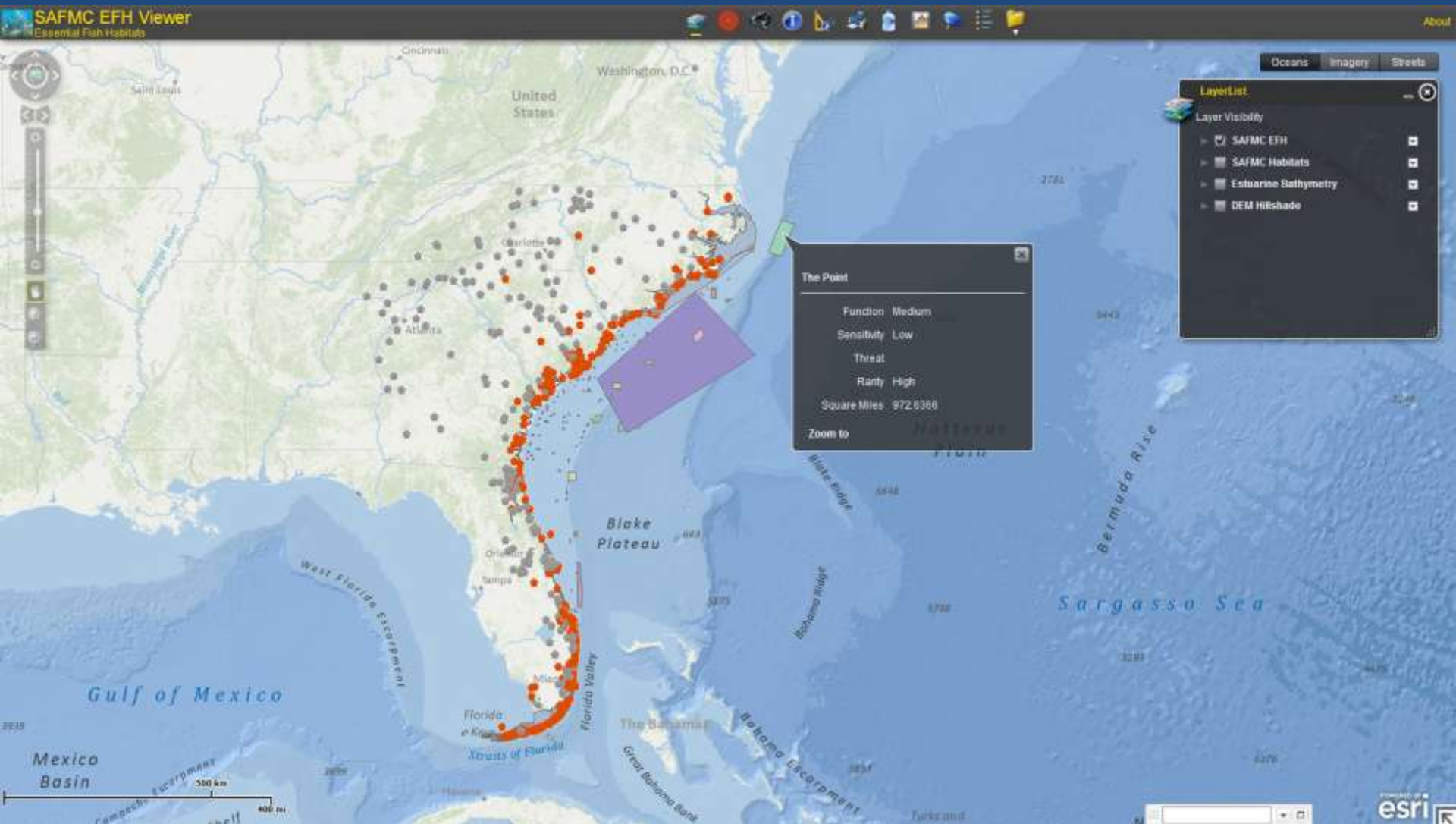


Initial extent displays Snapper Grouper EFH-HAPC and the South Atlantic Public Notices for FY 2011. Options to view SAFMC Habitats, Estuarine Bathymetry, and DEM Hillshade services.

Click map for information



Click map for information



Click map for information

The screenshot displays the SAFMC EFH Viewer application interface. The main map shows the Florida coastline and the Bahamas, with various Essential Fish Habitats (EFH) overlaid in different colors. A popup window is open over the map, displaying the following information:

- Longitude: -79.96667
- Description: Begins to sink
- Image Link: [http://ocean.fondamain](#)

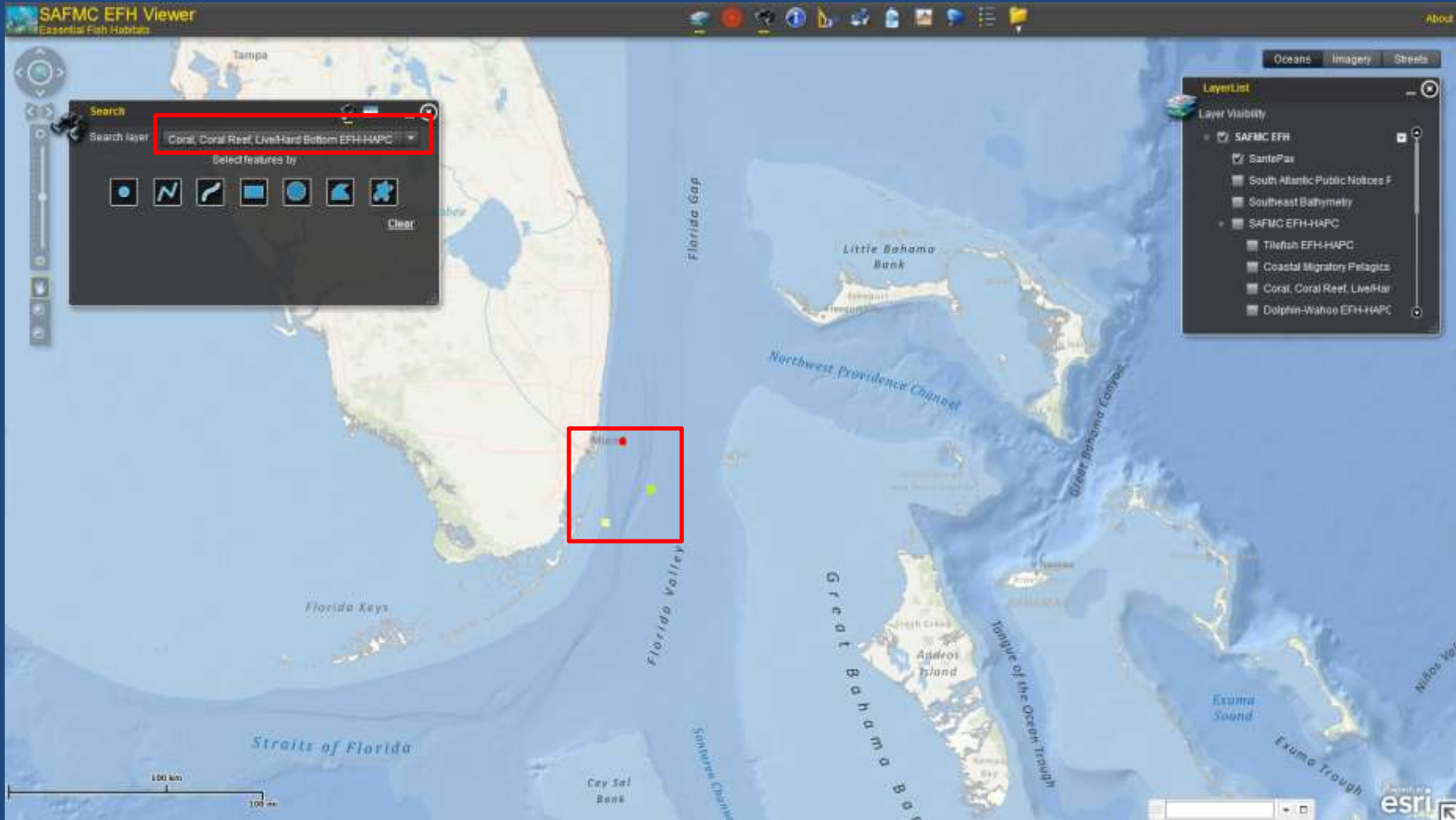
Below the text, there is a section titled "Sante Pax Images" containing a small image of a boat on the water. To the right of the map, a "LayerList" panel is visible, showing the following layers and their visibility status:

- SAFMC EFH (checked)
- SantePax (checked)
- South Atlantic Public Notices F (unchecked)
- Southeast Bathymetry (unchecked)
- SAFMC EFH-HAPC (checked)
- SAFMC EFH (unchecked)
- Highly Migratory Species (unchecked)
- United States (unchecked)
- SAFMC Habitats (unchecked)

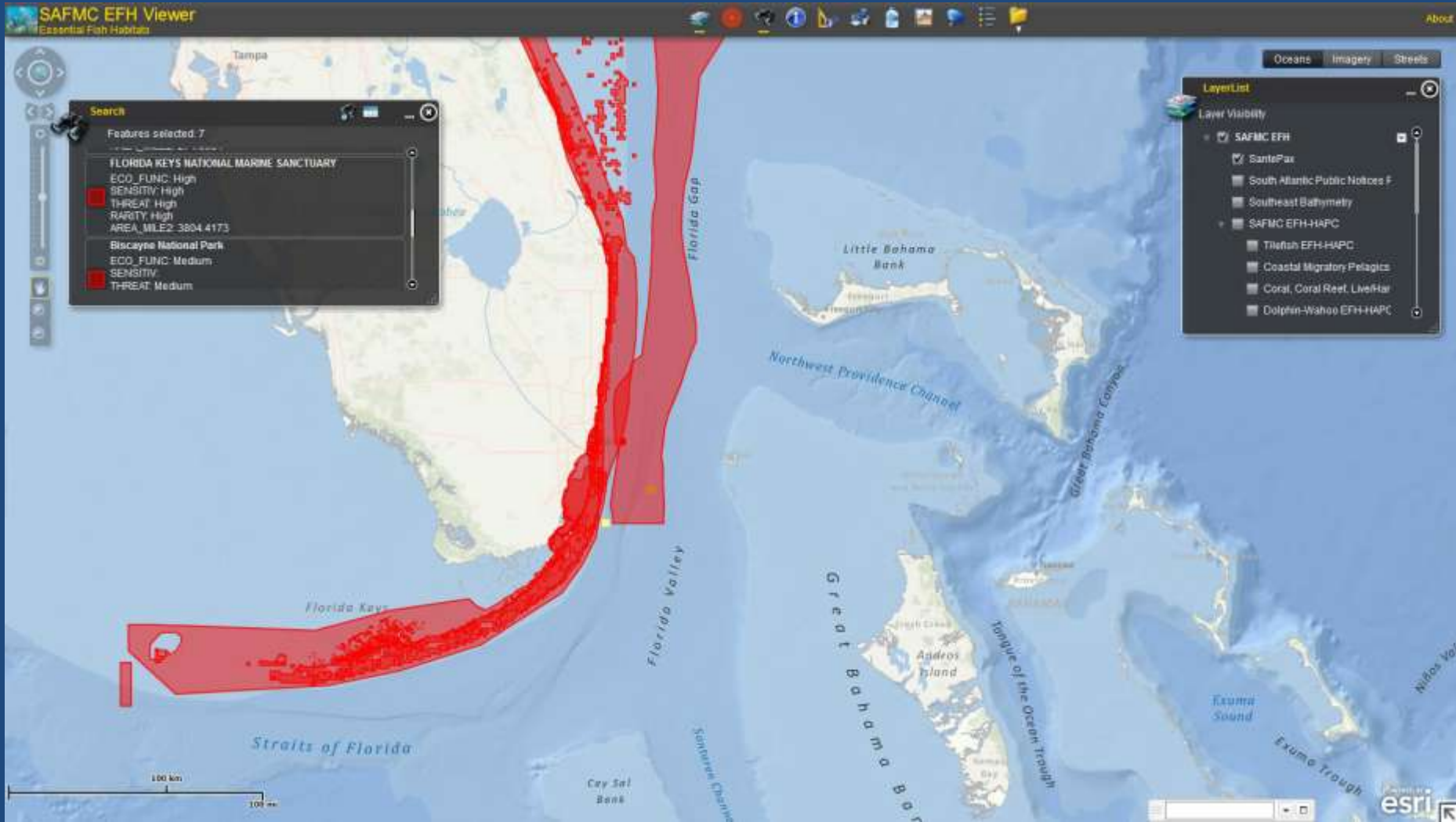
The application title bar reads "SAFMC EFH Viewer" and "Essential Fish Habitats". The Esri logo is visible in the bottom right corner of the map area.



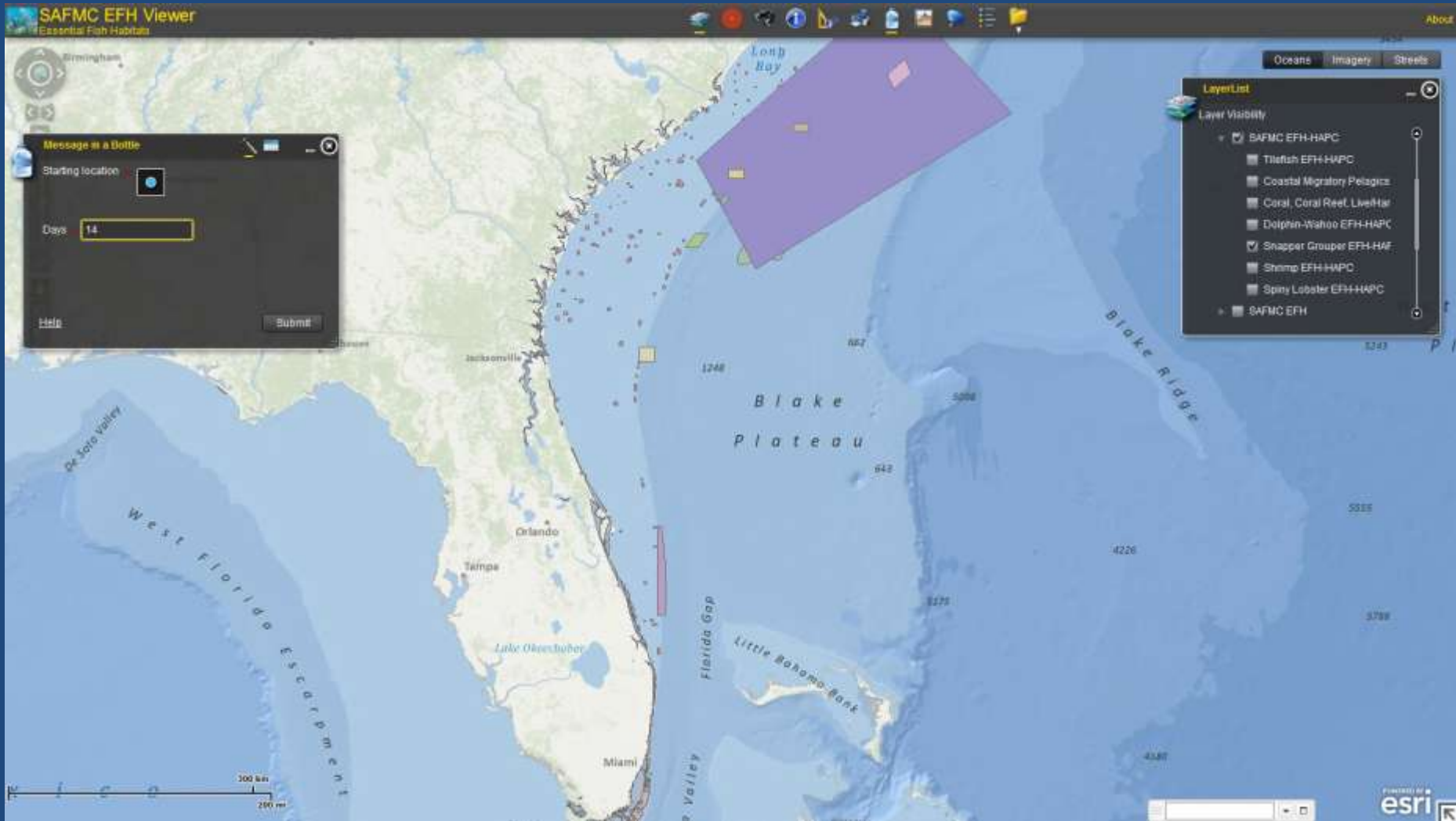
Search Coral EFH-HAPCs in area



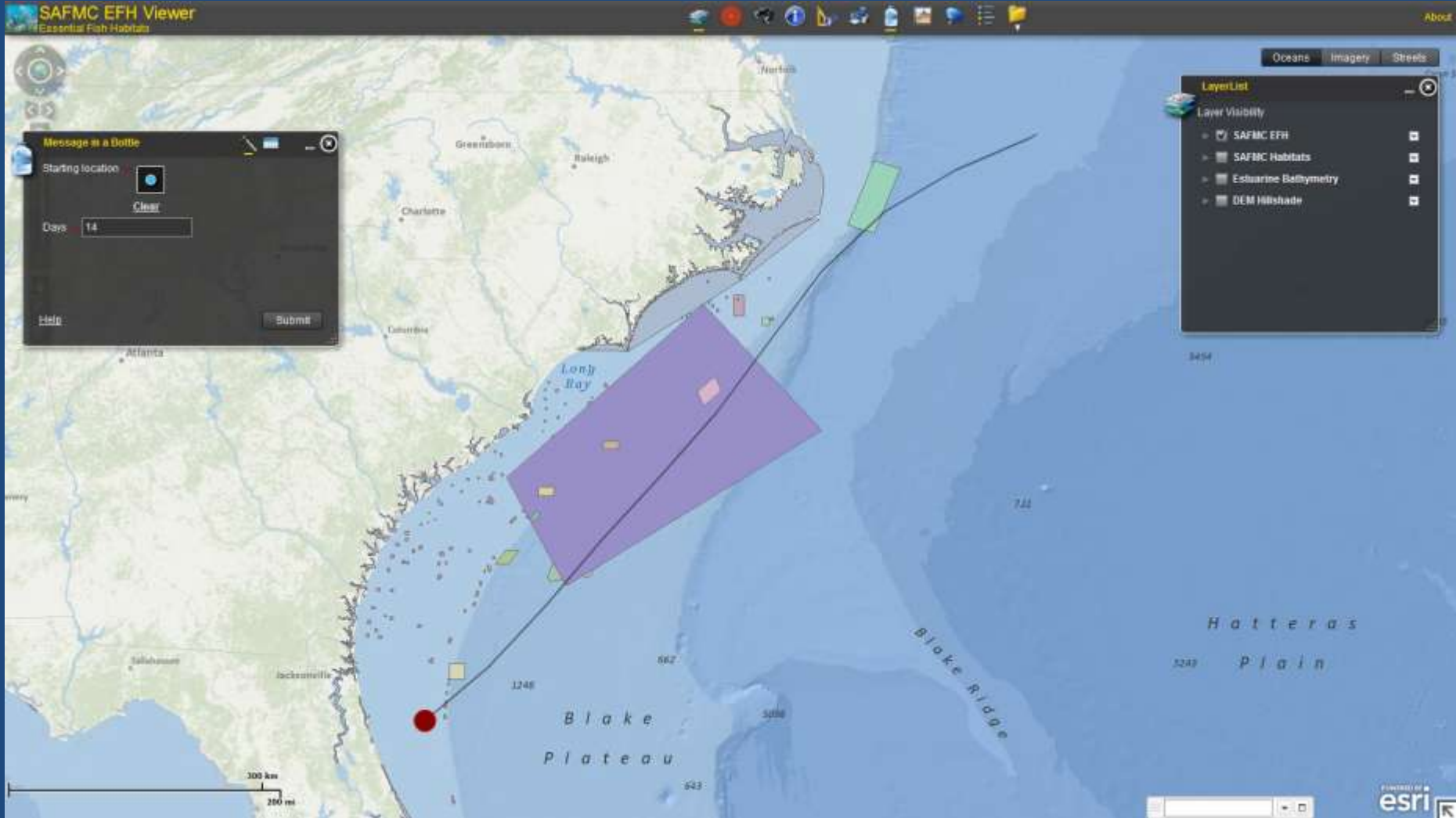
Search CHAPCs in area



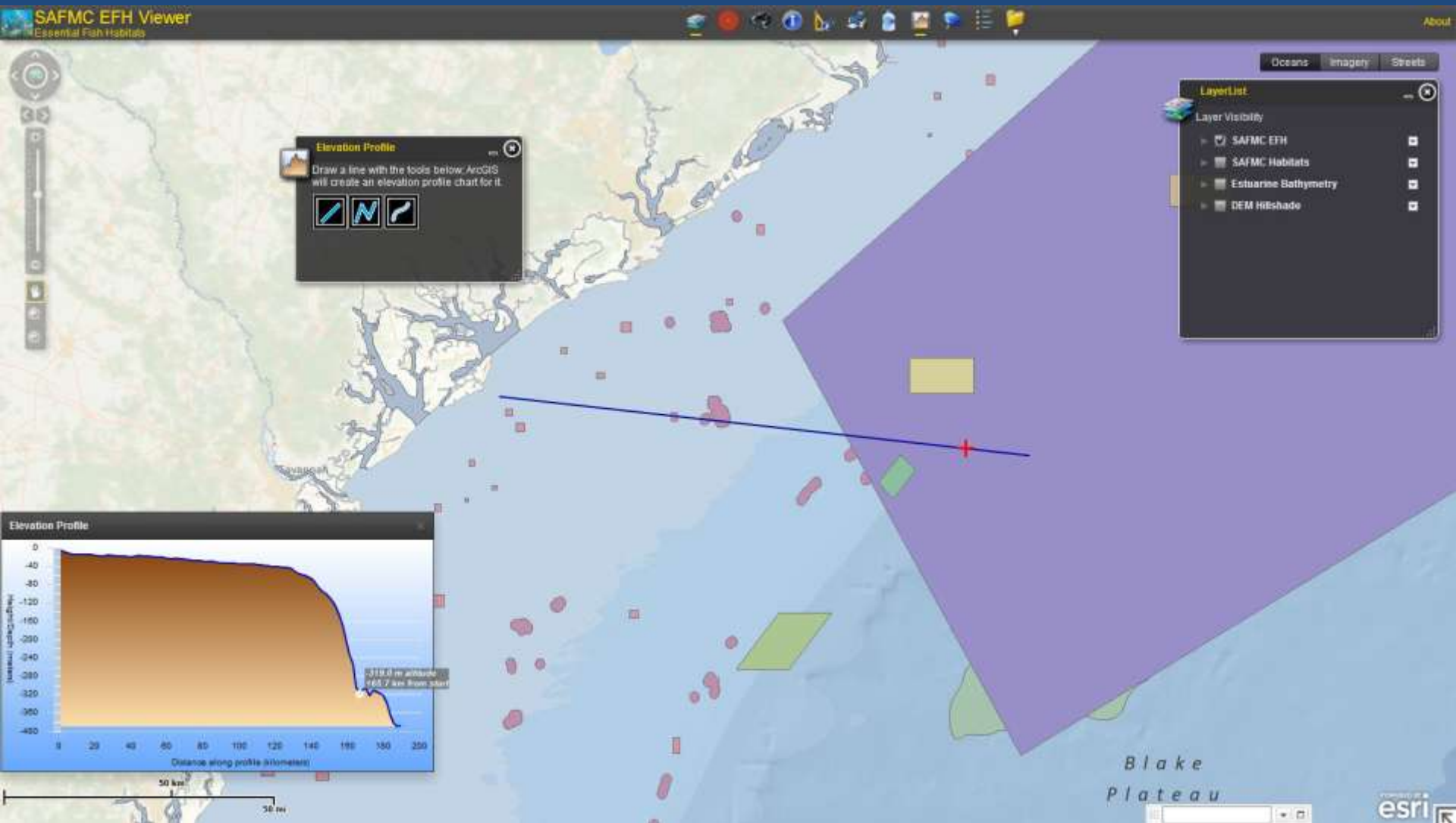
Message in a Bottle



larvae in a bottle?



Elevation Profile



SAFMC Fisheries

- currently serves SEAMAP-SA species data, MARMAP species data, MARMAP gear types, focal species distributions, bathymetry, and boundaries for the continental shelf, US Federal State and US Territorial Seas.

SAFMC Fisheries

SAFMC Fisheries Viewer
Fisheries Independent Monitoring Programs

South Atlantic Fishery Management Council
To Conserve and Manage

Welcome to the SAFMC Fisheries Viewer.

This prototype application was developed for the South Atlantic Fishery Management Council (SAFMC) with ArcGIS Viewer for Flex. It displays fishery independent data collected by the SEAMAP - South Atlantic (SA) component and by the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) program. The application also contains several base layers and data from EcoGIS.

More information regarding the SAFMC and the data sources of this project can be found at the links below.

- [SAFMC](#)
- [SEAMAP - South Atlantic Surveys](#)
- [MARMAP Program](#)
- [ArcGIS Viewer for Flex](#)

Click to continue

LayerList
Layer Visibility

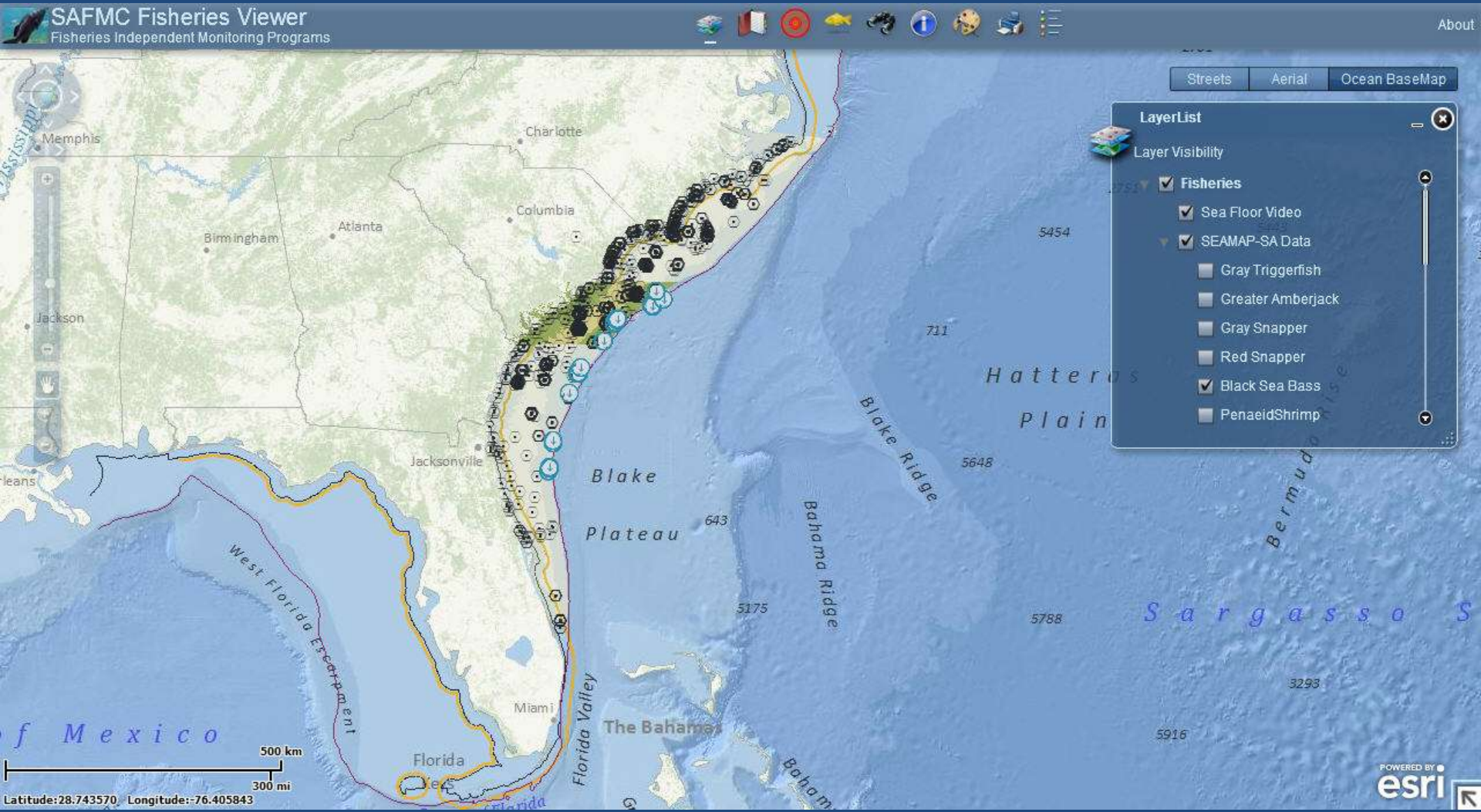
- Fisheries
- Marine Habitat

esri

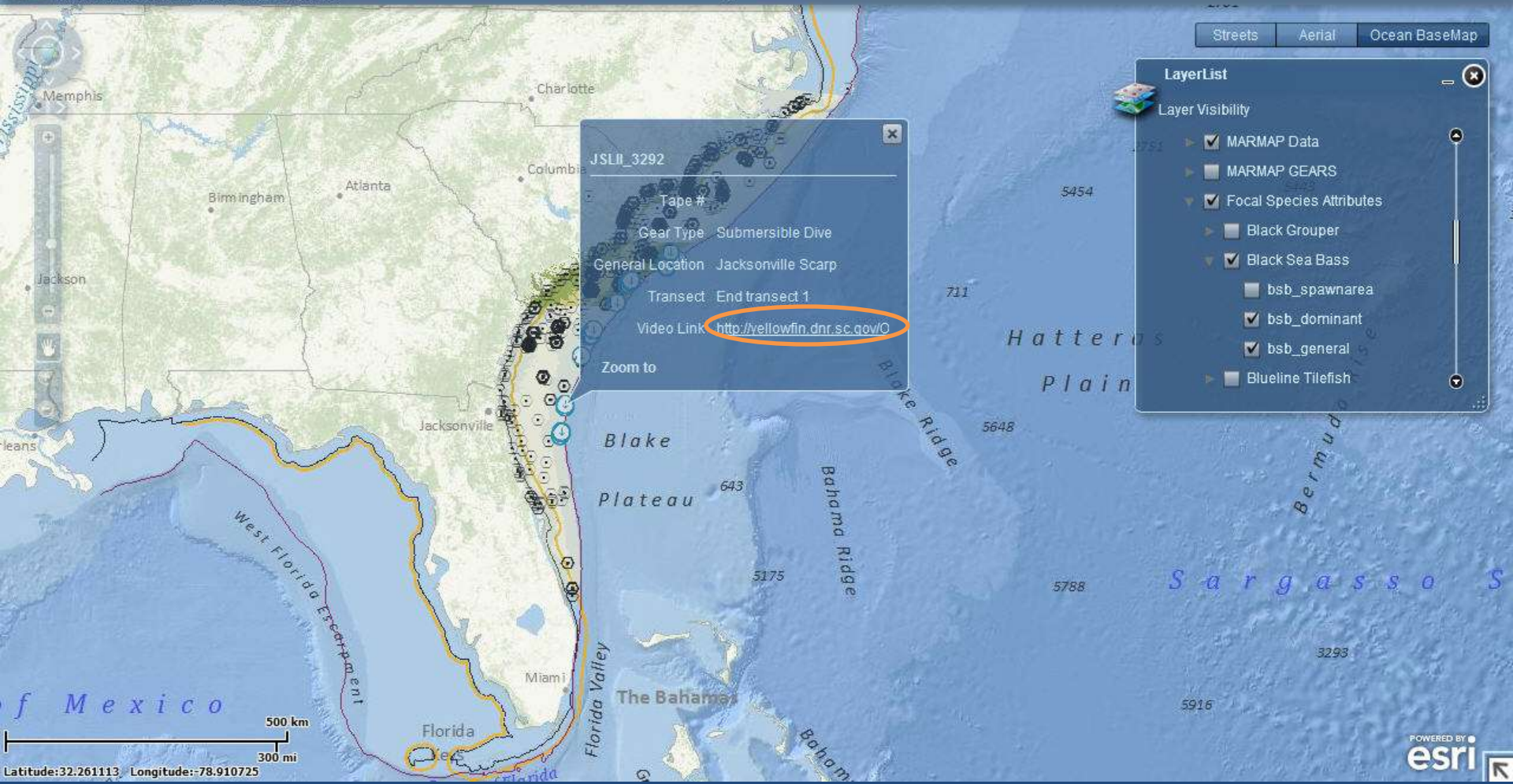
accessible via the following URL:

<http://ocean.floridamarine.org/SA_Fisheries>

SAFMC Fisheries



Initial map shows data points for Black Sea Bass from the SEAMAP-SA and MARMAP projects. The map also displays general depth ranges of Black Sea Bass and Sea Floor Videos.



Streets Aerial Ocean BaseMap

LayerList

Layer Visibility

- MARMAP Data
- MARMAP GEARS
- Focal Species Attributes
 - Black Grouper
 - Black Sea Bass
 - bsb_spawnarea
 - bsb_dominant
 - bsb_general
 - Blueline Tilefish

JSLII_3292

Tape #

Gear Type Submersible Dive

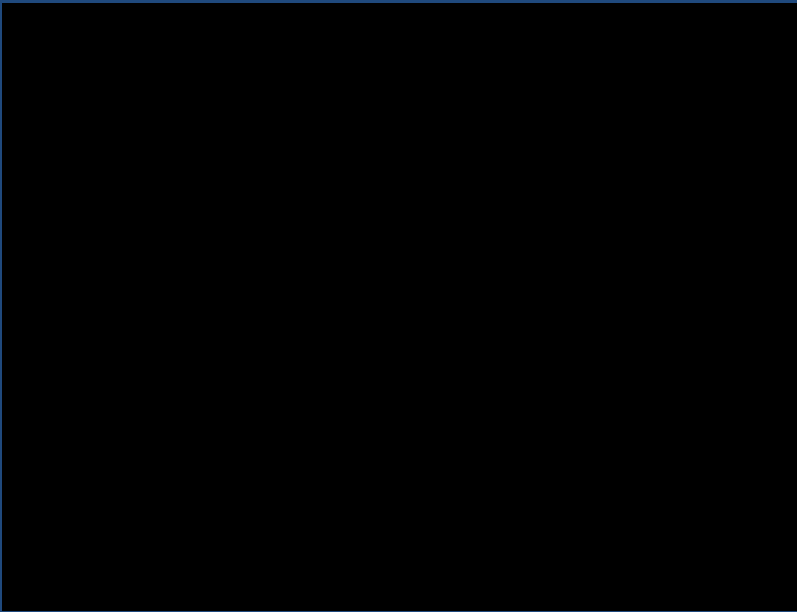
General Location Jacksonville Scarp

Transect End transect 1

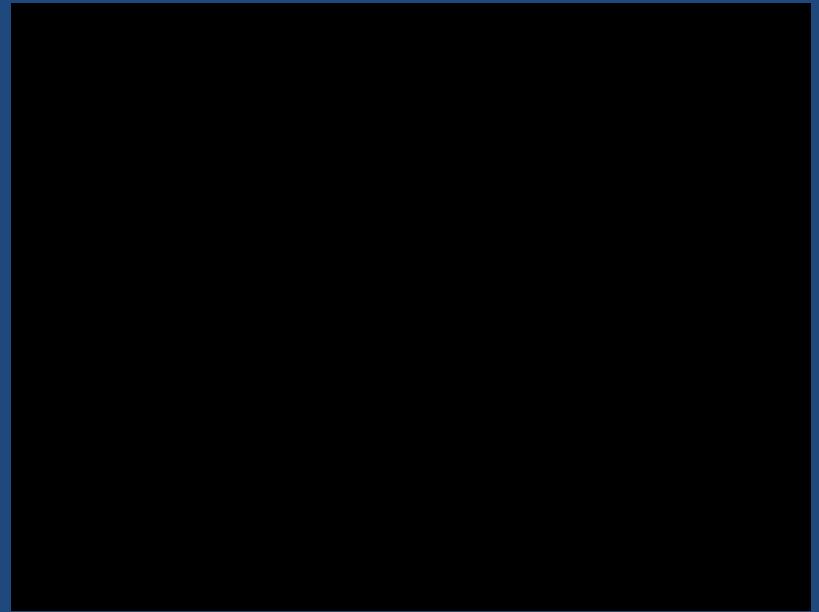
Video Link <http://yellowfin.dnr.sc.gov/O>

Zoom to

SCDNR Submersible Dives

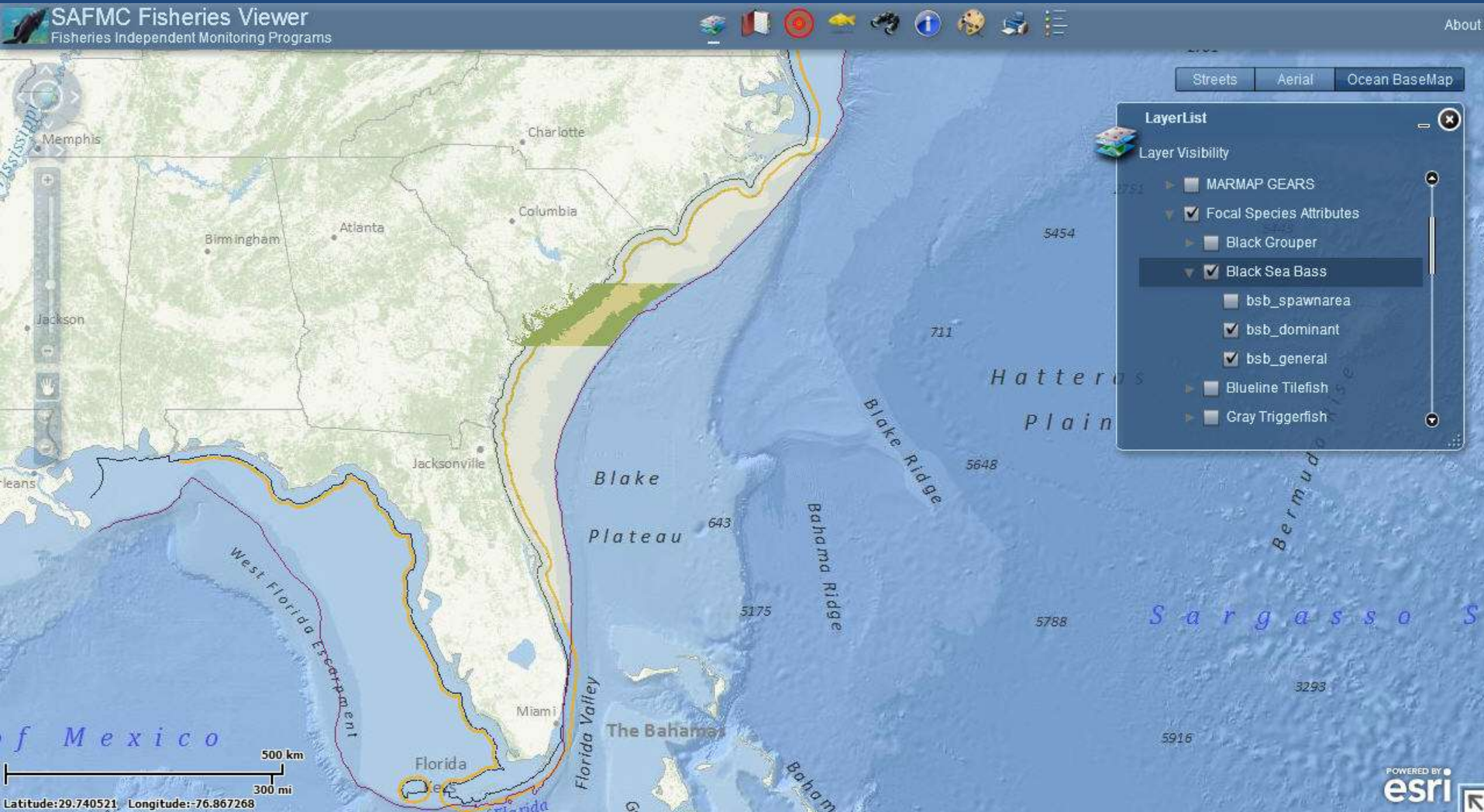


Jacksonville Scarp
02_3291_eT7.mpg



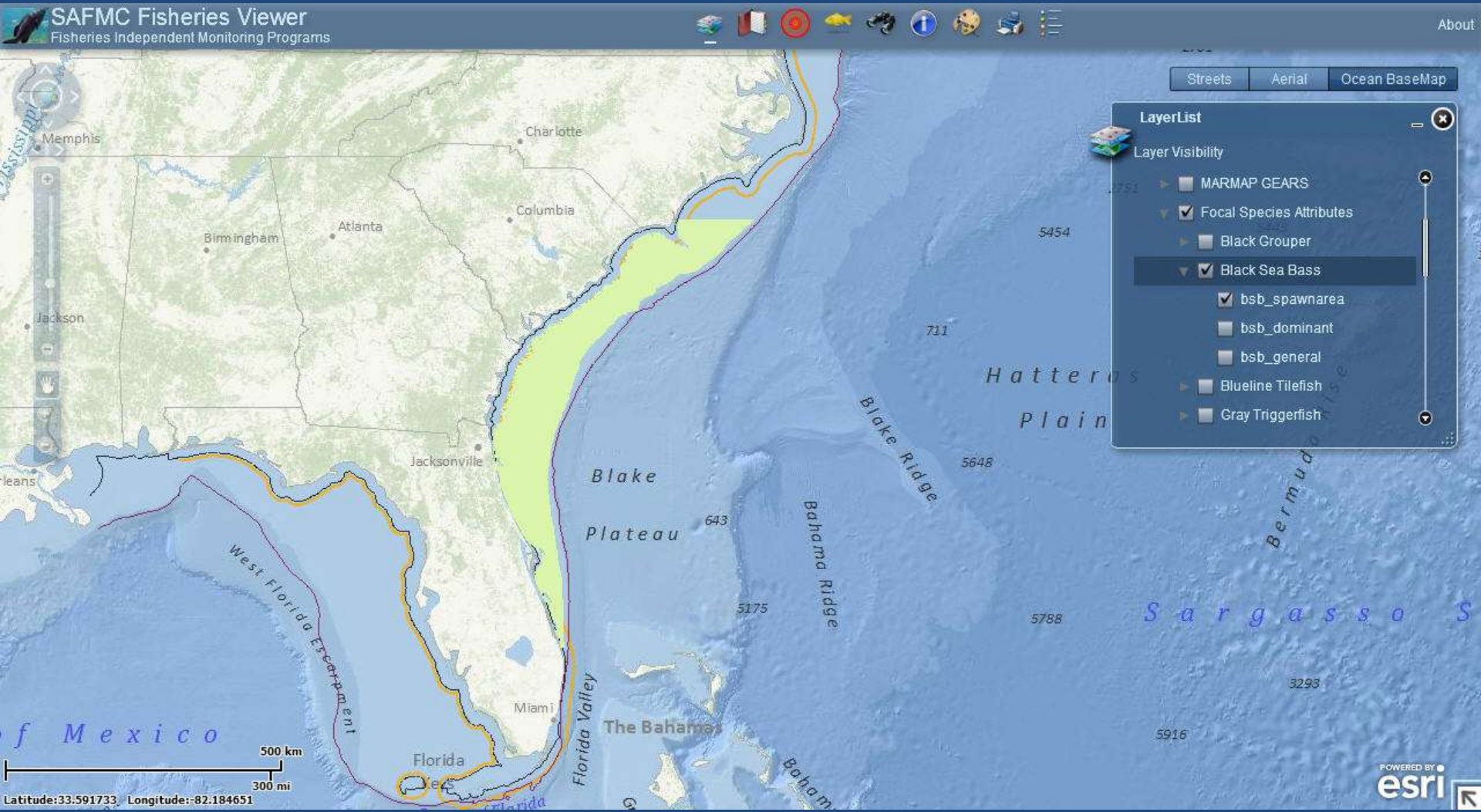
Razorback
03_3413_eT5.mpg

Focal Species Attributes



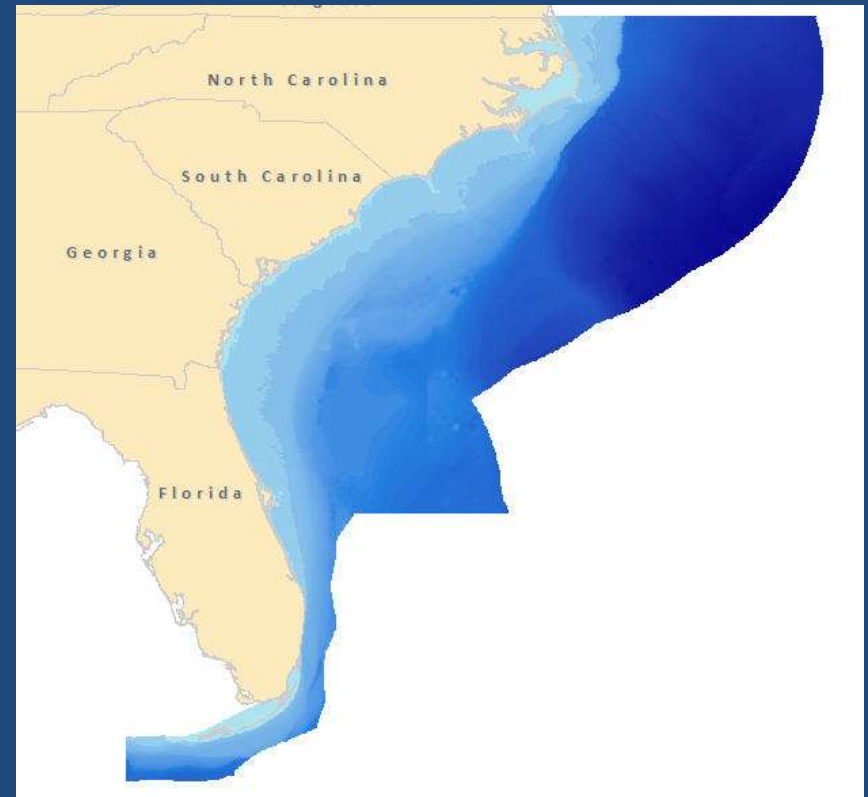
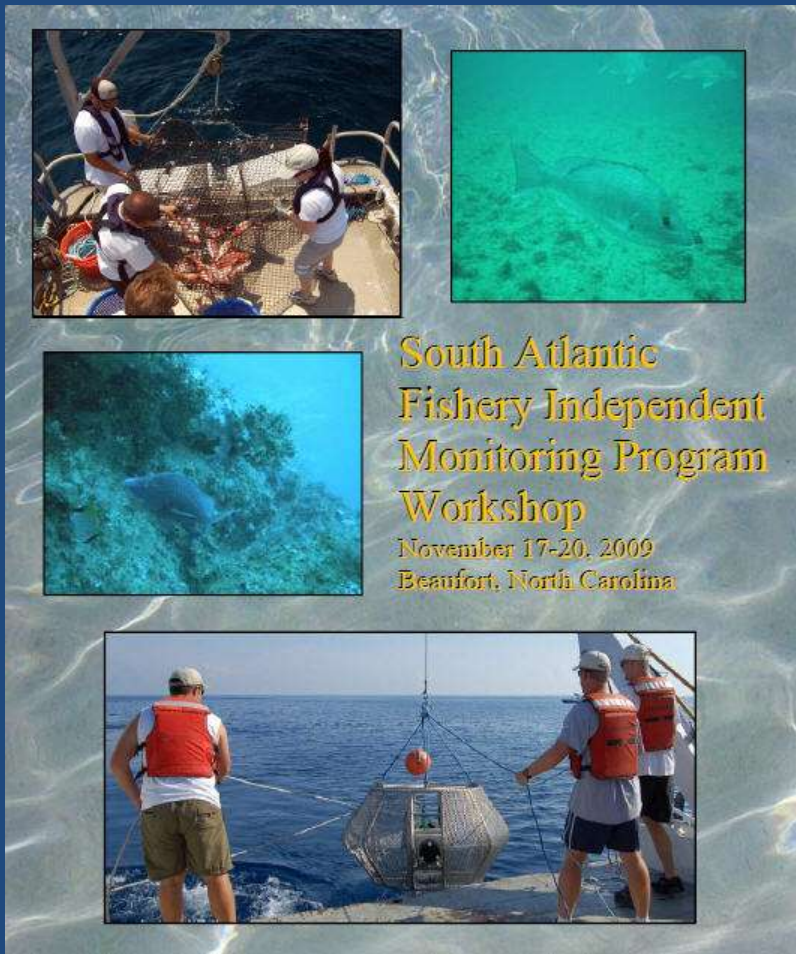
General depth range distribution for Black Sea Bass. Depth Range = 2-130m, Mean Depth = 20 -35m. Darker shading indicates the dominant area for this species 32-33° N.

Focal Species Attributes



Black Sea Bass Spawning depths 15-56m between 27-34°

Focal Species Distribution Sources



[ETOPO1 Global Relief Model](#) – clipped
and reclassified

Life History Report

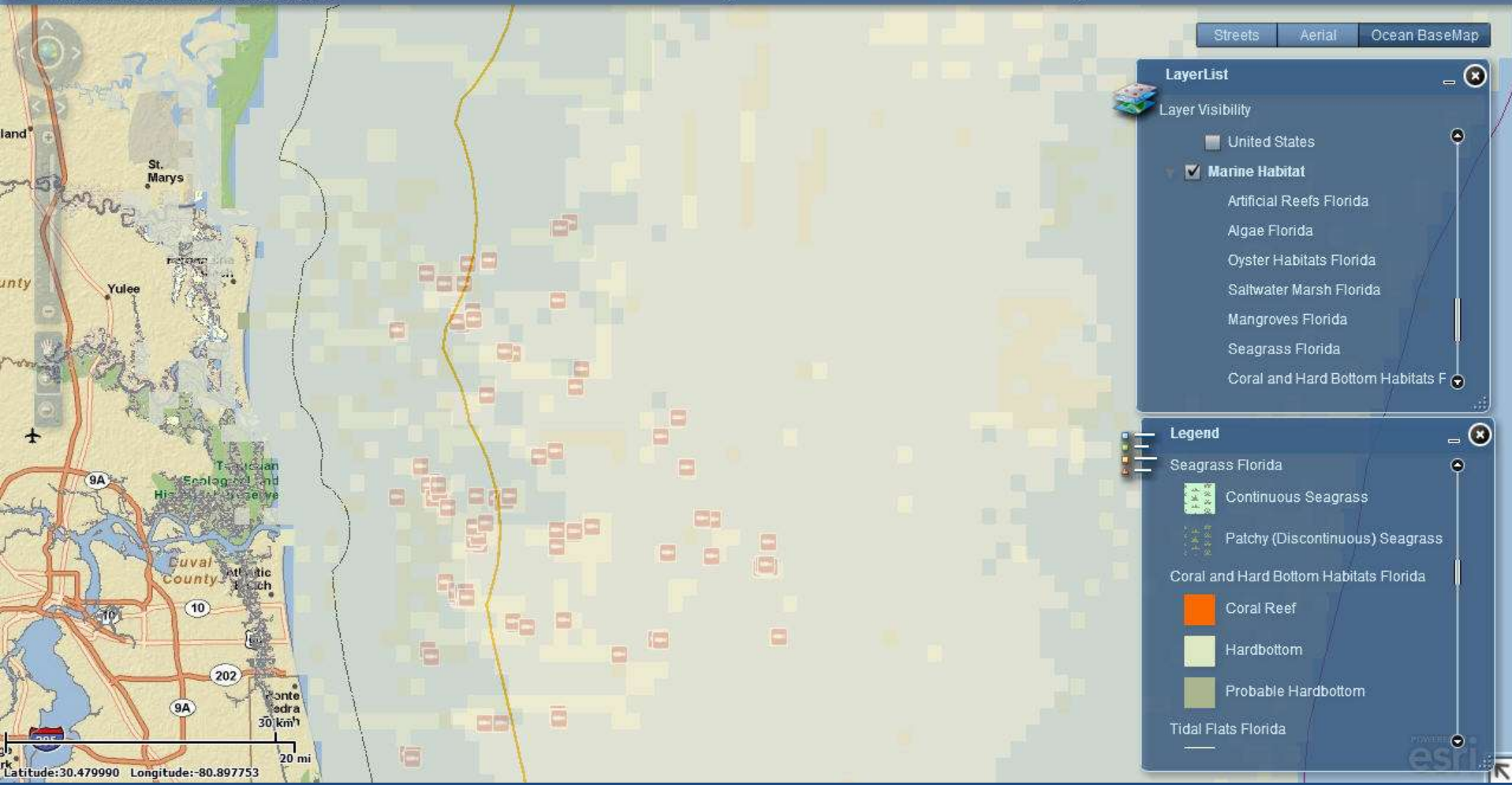
South Atlantic Fishery Independent Monitoring Program Workshop, November 17-20, 2009, Beaufort, NC

Table 1. Attributes of focal species. Abbreviations: CH = Cape Hatteras; Atl = Atlantic; LB = live bottom; AR = artificial reef; Est = estuary; NA = not available; NS = not significant; SAV = submerged aquatic vegetation.

Stock	Stock Genetic Diff in SA	Home Range or Migration	Depth Effect	Area Found	Dominant Area	Adult habitat	Juvenile Habitat	Peak Spawning	Female Spawning Season	Spawning Depth (m)	Spawning Area	Mean depth caught (m)	Min	Max
Black Sea Bass	NS	Small (larger move more)	NA	Fort Pierce to CH/Atl Coast	32-33 N	LB/AR	Reef, Oyster, SAV	Feb-Apr	Feb-Jul, Sep, Nov	15-56	27-34 N	20-35	2	130
Gag	Ongoing	Large	Male Female Separation Larger offshore	SA	SA	LB/Ledge	Est/Reef	Mar-Apr	Dec-May	24-117	26-33 N	20-50	2	152
Snowy Grouper	NA	Unknown	Larger offshore	SA plus VA	SC/NC	Rock, Ledge, Wreck	Inshore of Adult 50 m	Unknown	Apr-Sep	176-232	24-34 N	100-200	30-50	525
Red Grouper	NS	Small	Larger offshore	Keys to NC	Keys and NC	Live, Rock, Sand, AR	Reef, Lesser extent Est with SAV	Feb-Apr	Dec-Jun	30-90	Keys and NC	30-45	20	95
Black Grouper	NS	Small	Larger offshore	Keys to Cape Lookout	Keys	Live, Rock, Ledges, AR	Reef, SAV, Oyster	Jan-Mar	Possibly Year Round	<100	Keys	30-40	9	60
Speckled Hind	NA	Unknown	Larger offshore	Keys to CH	Unknown	Ledges, Rock	Ledges, Rock	Unknown	May-Oct	Unknown	Unknown	75-100	28	165
Scamp	NA	Seasonal Possible	Larger offshore	Keys to Cape Hatteras	Carolinas	Live, Rock, Ledges, AR	Unknown in SA rarely in Estuaries	Mar-May	Feb-July	33-93	29-32 N (sampling effect)	30-50	17	113
Warsaw Grouper	NA	Unknown	Larger offshore	Keys to CH	Unknown	Live, Rock, Ledges, Pinnacles	Live, Rock, AR, Ledges	Unknown	Aug-Oct			70-110	30	500
Goliath Grouper	NA	Moderate	Juveniles use estuaries adults offshore	Keys to Cape Lookout	Keys	Mangroves, Bridges, Coral, AR	Mangroves and Estuaries	Jul	Jun-Dec			20-50	7	100
Yellowedge Grouper	NA	Unknown	Larger offshore	Keys to Cape Hatteras	N FL to SC	Rock and Ledges	Unknown		Apr-Oct	160-194	31 N (sampling effect)	100-200	64	275
Vermilion Snapper	NA	Small	Larger offshore	Cape Canaveral to CH	N FL to Cape Lookout	LB/Rock/AR	20-30 m depth AR & LB	May-Aug	Apr-Dec	18-97	27-34 N	<76	14	163
Red Snapper	Ongoing	Small	May move inshore to form spawning aggregation	Fort Pierce to CH	Fort Pierce to GA	LB/Rock/AR	Live Bottom Low relief	Jun-Sep	May-Oct	24-67	27-33 N	20-50	10	150
Yellowtail Snapper	NA	Unknown	Unknown	Keys to Cape Lookout	FL	Live, Rock, Reefs, AR	Back reefs and SAV	May-Jul	Feb-Oct		S FL	20-40	10	70

14 species processed

- Black Sea Bass
- Gag
- Snowy Grouper
- Red Grouper
- Black Grouper
- Scamp
- Red Snapper
- Tilefish
- Blueline Tilefish
- Red Porgy
- Greater Amberjack
- Gray Triggerfish
- White Grunt
- Wreckfish

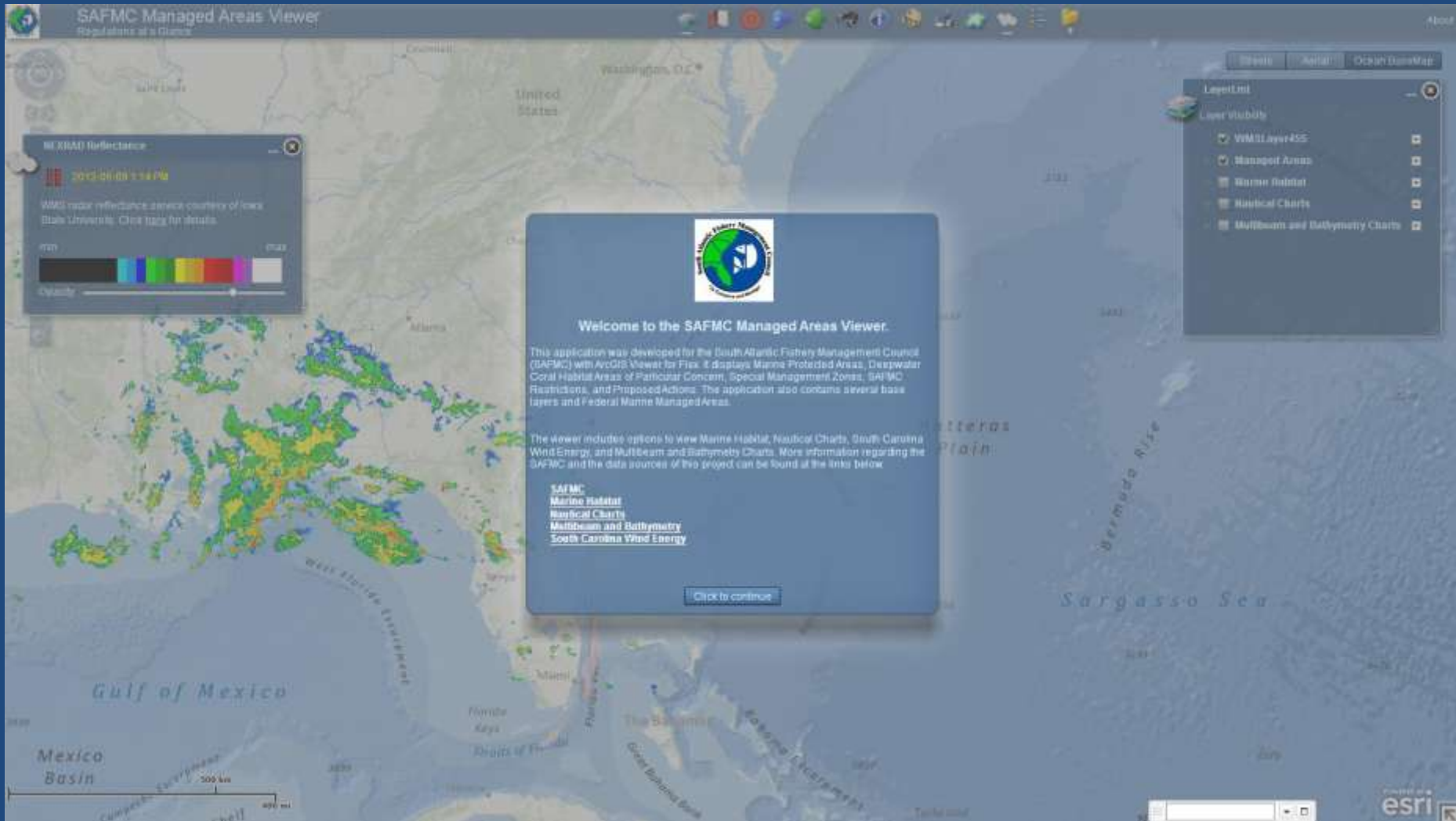


Black Sea Bass general depth range overlaying the FWC cached Marine Habitat map service.

SAFMC Managed Areas

- contains data for the Allowable Golden Crab Fishery Areas, Shrimp Fishery Access Areas, and Deepwater Coral HAPCs.
- also includes SAFMC Restrictions, Marine Protected Areas, Oculina CHAPC, Special Management Zones, Danger Zones, and other Federal Marine Managed Areas.

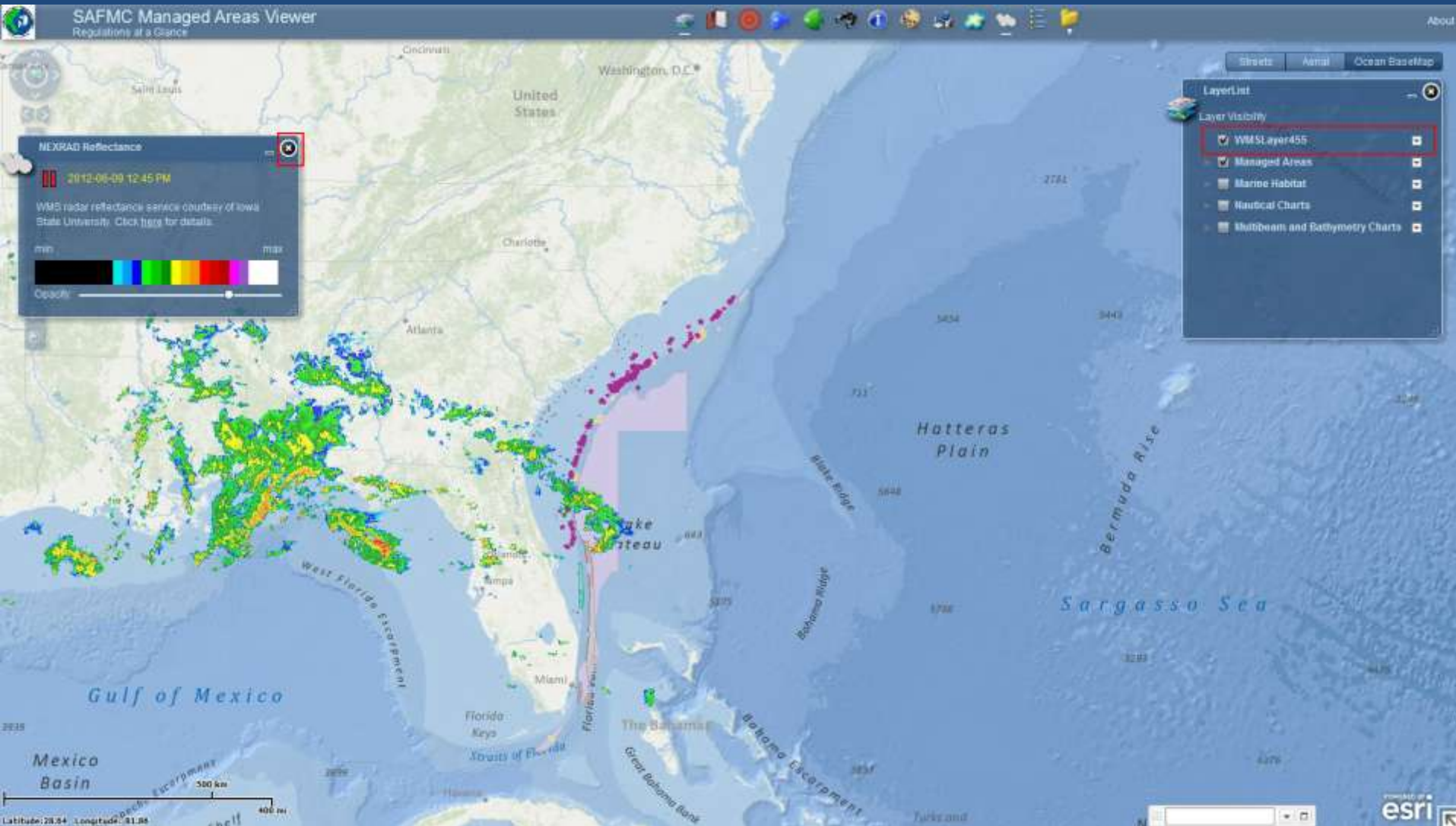
SAFMC Managed Areas



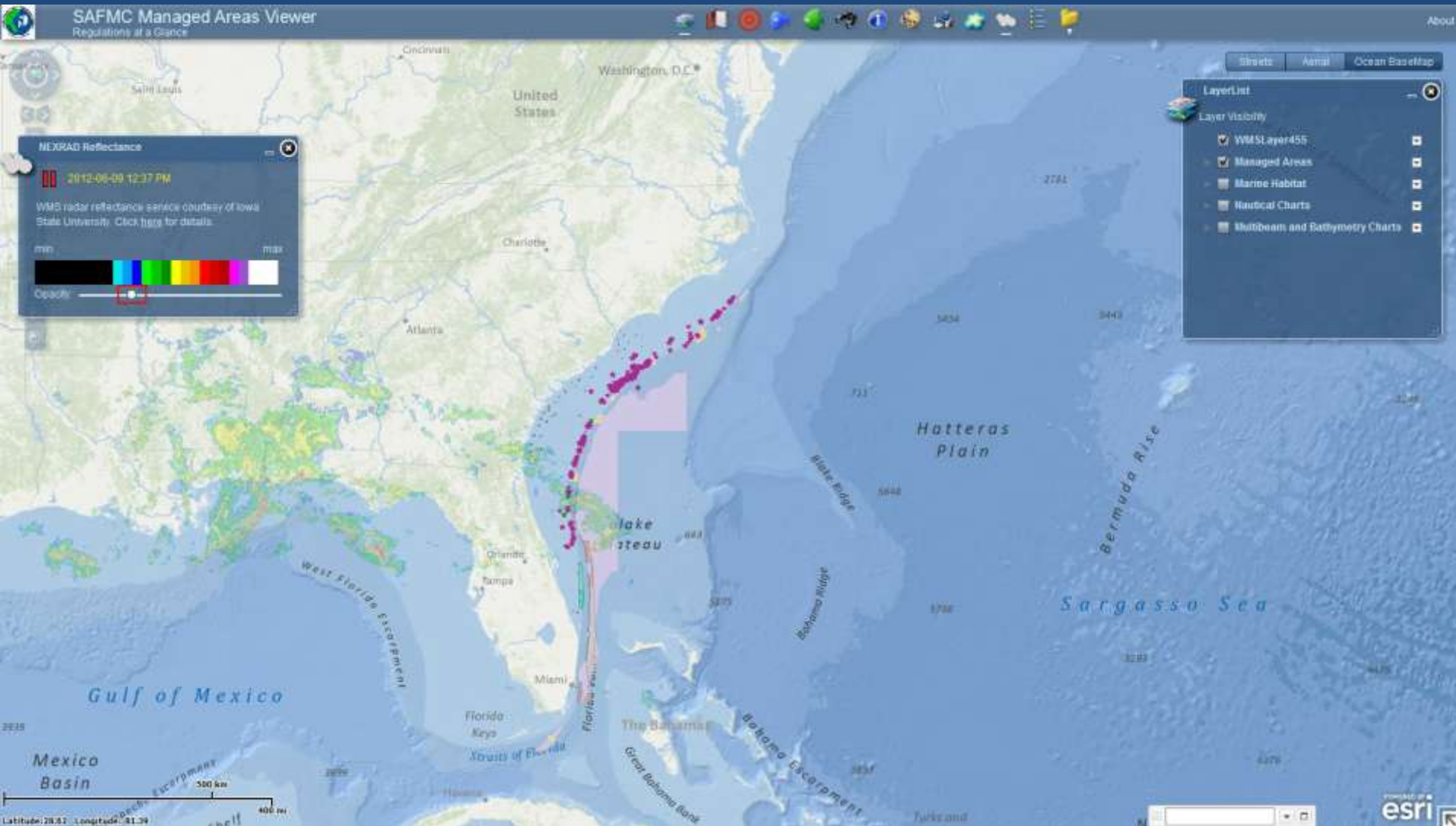
The graphic displays the initial view of the SAFMC Managed Areas viewer.

<http://ocean.floridamarine.org/safmc_managedareas>

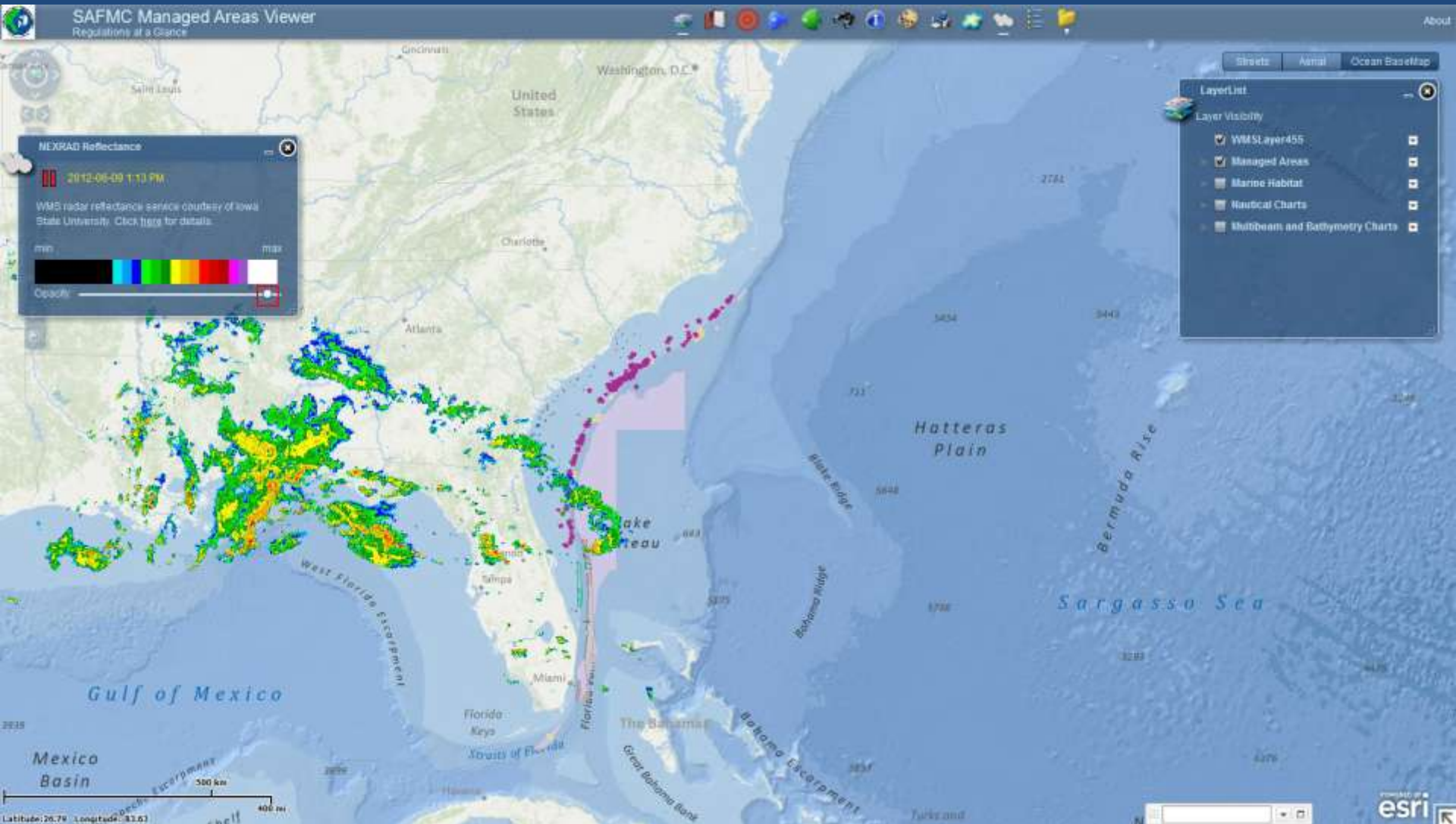
How's the weather?



Why not change it?



By adjusting transparency



Integrated hyperlinks

The screenshot displays the SAFMC Managed Areas Viewer application. The main map shows the Gulf of Mexico coastline with various managed areas highlighted in purple and pink. A popup window is open over the Jacksonville area, providing details for the Jacksonville MPA. The popup includes the following information:

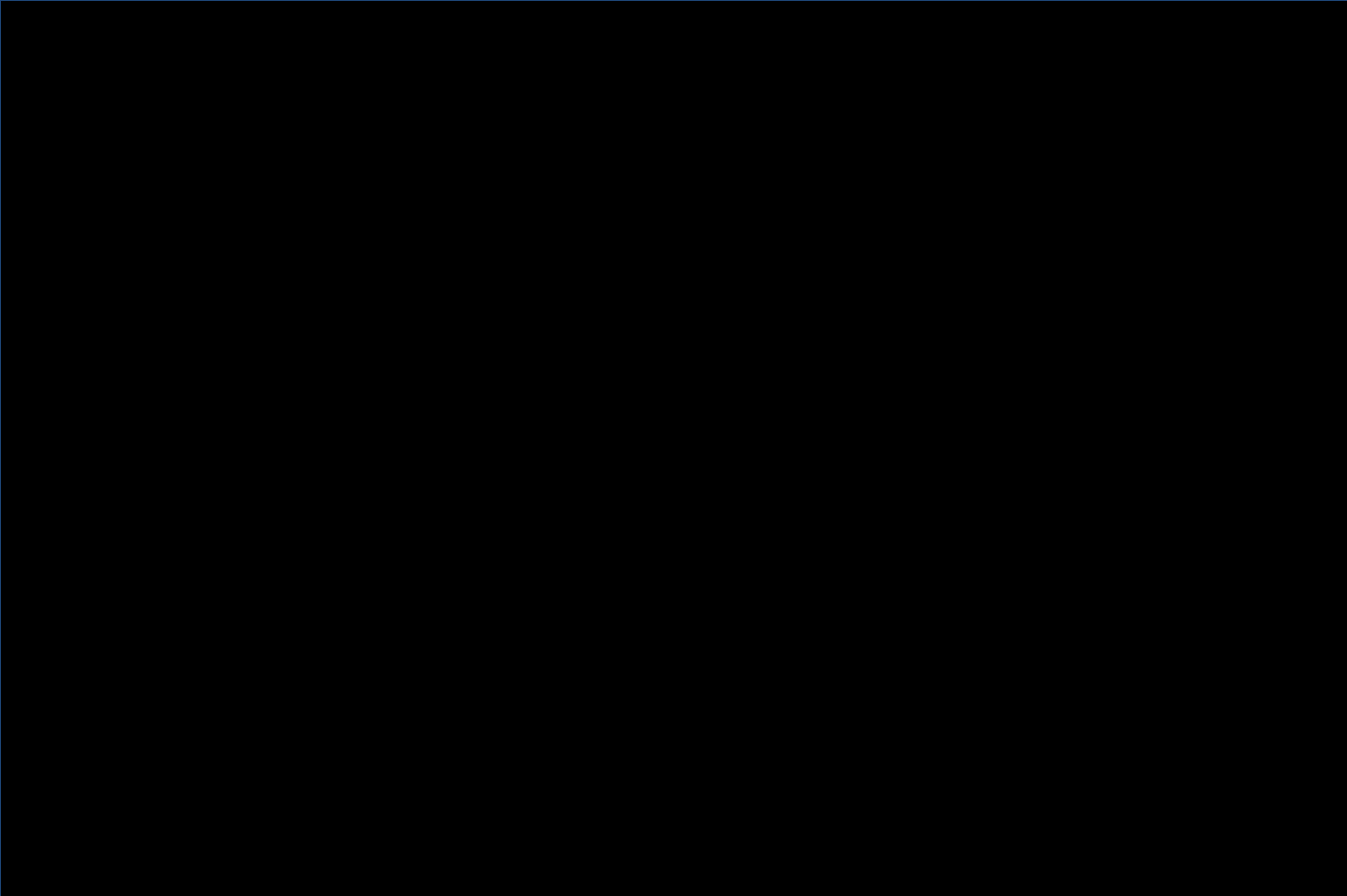
- MPA Name:** Jacksonville MPA
- Area Square Miles:** 147,571.1 (2862)
- Data Source:** NOAA Fisheries Lab
- Image Link:** <http://ocsp.noaa.gov/ocsp/>
- Video Link:** <http://www.noaa.gov/ocsp/>

The popup also features a small thumbnail image of the Jacksonville MPA. On the right side of the application, there is a LayerList panel with the following layers:

- Managed Areas
- Marine Habitat
- Nautical Charts
- Multibeam and Bathymetry Charts

The application interface includes a toolbar at the top with various navigation and tool icons, a scale bar at the bottom left, and the Esri logo at the bottom right. The title bar reads "SAFMC Managed Areas Viewer" and "Regulations at a Glance".

Georgia MPA video



CHAPC Bookmarks

The screenshot displays the SAFMC Managed Areas Viewer interface. At the top, the title bar reads "SAFMC Managed Areas Viewer" with the subtitle "Regulations at a Glance". The browser's address bar shows the URL "http://www.safmc.gov/managed-areas-viewer".

On the left side, a "Bookmarks" panel is open, listing several CHAPC (Cape Hatteras Outer Protection) areas:

- Contiguous USA
- Outline CHAPC
- Cape Lookout Lophelia Banks CHAPC
- Cape Fear Lophelia Banks CHAPC
- Beaufort/Savannah and East Florida Lophelia/Miami CHAPC
- Panhandle Terrace CHAPC

The main map area shows the Southeastern United States coastline, including the Gulf of Mexico, Florida Keys, and the Atlantic Ocean. Key geographical features labeled include the Hatteras Plain, Bermuda Rise, Sargasso Sea, and various ridges and plateaus. A pink shaded area highlights the CHAPC region along the North Carolina coast. The map includes a scale bar (0 to 400 miles) and coordinate information (Latitude: 38.35, Longitude: -80.49).

On the right side, a "LayerList" panel is visible, showing the following layers and their visibility status:

- Managed Areas (checked)
- Marine Habitat (unchecked)
- Nautical Charts (unchecked)
- Multibeam and Bathymetry Charts (unchecked)

The bottom right corner features the Esri logo and the text "powered by esri".

Cape Fear CHAPC

The screenshot displays the SAFMC Managed Areas Viewer interface. The main map area shows a light blue background with a large, semi-transparent pink polygon representing the Cape Fear Lophelia Banks CHAPC. The text "Cape Fear Lophelia Banks" is centered within this polygon. The map is overlaid with a grid of numbers: 192, 278, 285, 215, 287, 585, 557, and 580.

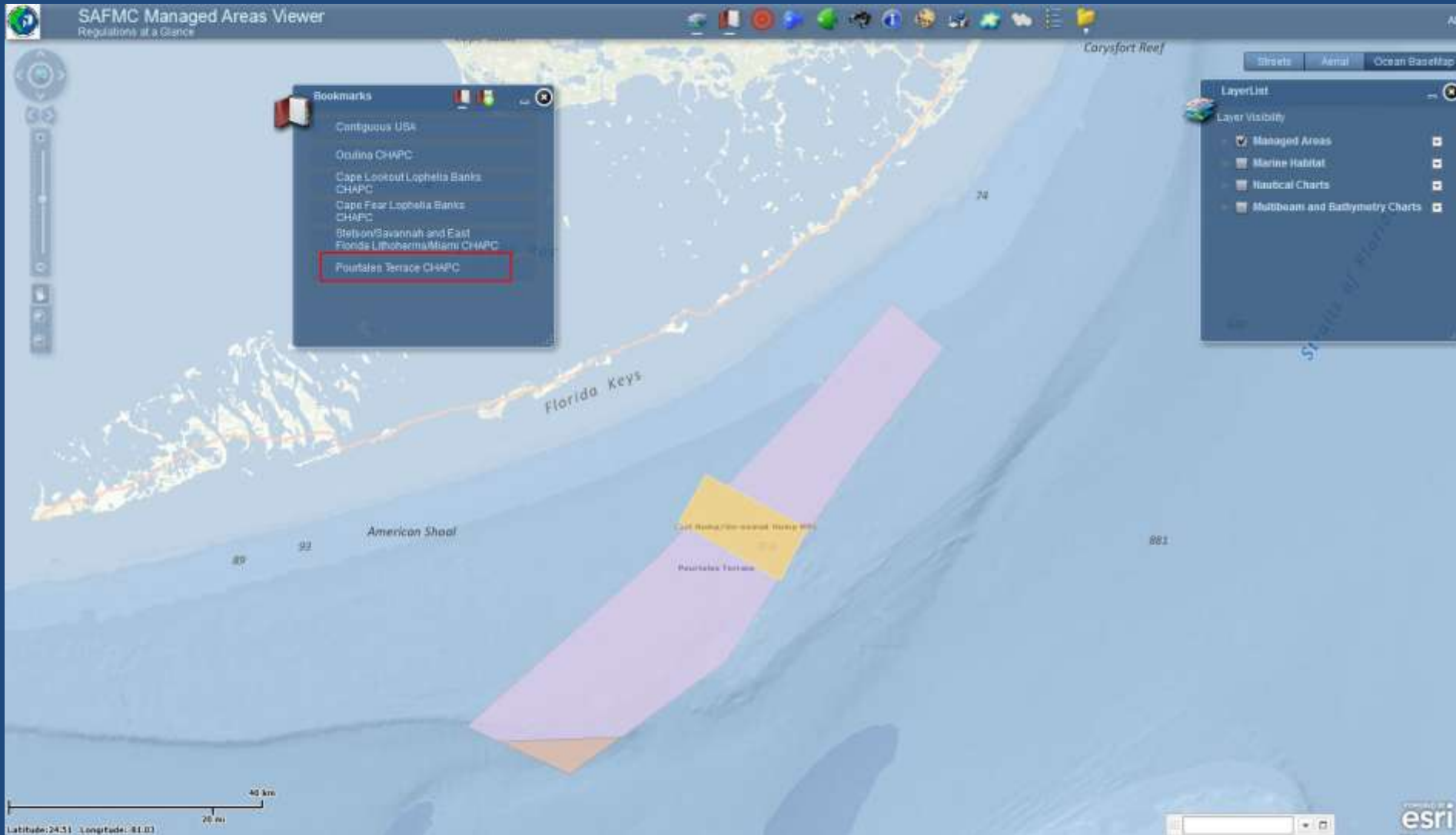
On the left side, there is a navigation control panel with a compass and a vertical slider. Below it, a scale bar indicates 10 km and 5 mi, with the coordinates "Latitude: 22.46, Longitude: -76.47" displayed.

Two panels are open on the right side of the map:

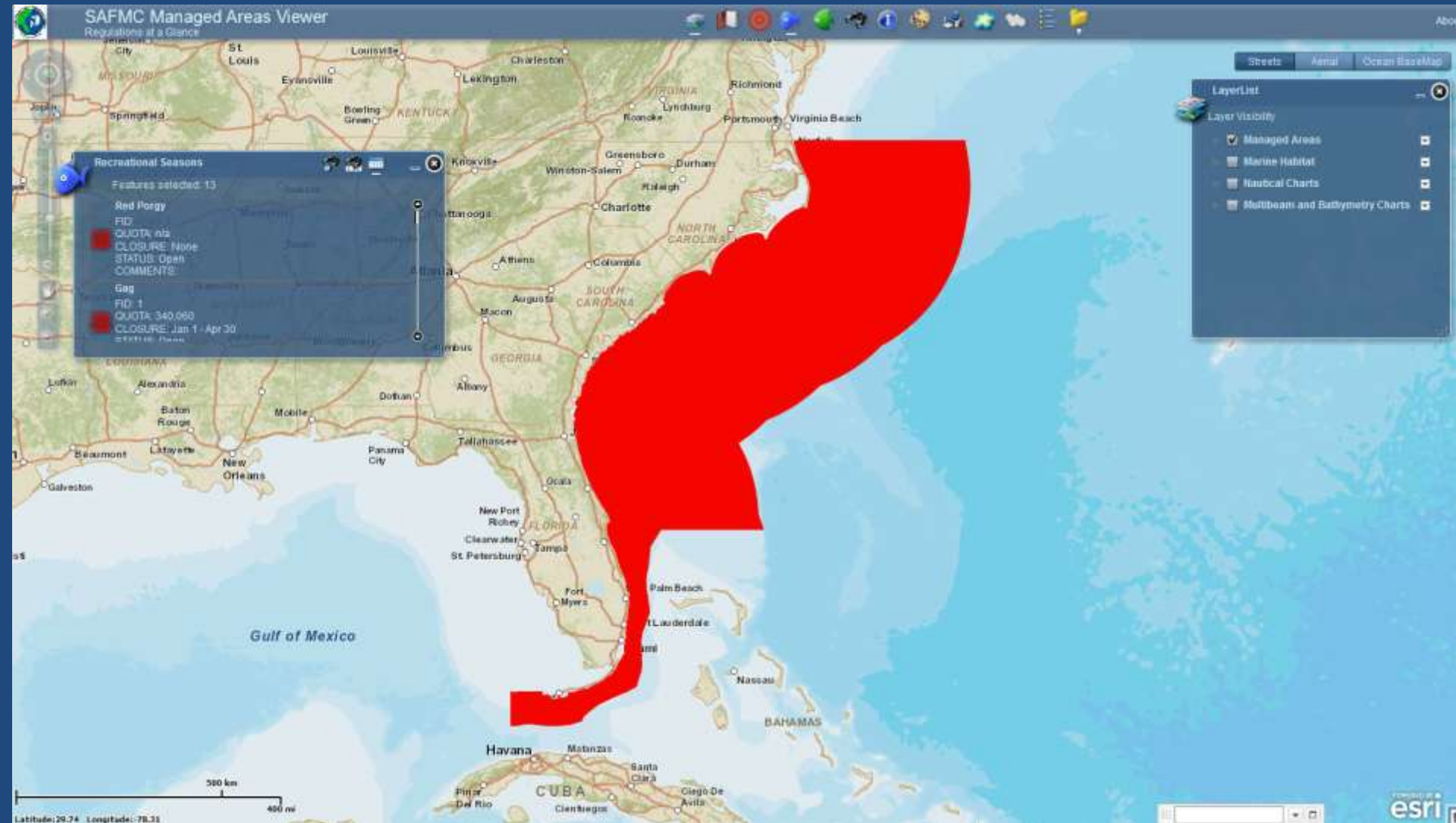
- Bookmarks:** A list of bookmarked areas. The entry "Cape Fear Lophelia Banks CHAPC" is highlighted with a red rectangular box. Other entries include "Contiguous USA", "Outline CHAPC", "Cape Lookout Lophelia Banks CHAPC", "Stetson/Savannah and East Florida Lithothamnium Miami CHAPC", and "PineIsles Terrace CHAPC".
- LayerList:** A panel titled "LayerList" with a "Layer Visibility" section. It contains four items, each with a checkbox and a square icon: "Managed Areas" (checked), "Marine Habitat", "Nautical Charts", and "Multibeam and Bathymetry Charts".

At the top of the interface, the title "SAFMC Managed Areas Viewer" and subtitle "Regulations at a Glance" are visible. A toolbar with various icons is located below the title. In the top right corner, there are tabs for "Streets", "Aerial", and "Ocean BaseMap", with "Ocean BaseMap" currently selected. An "About" link is also present in the top right corner.

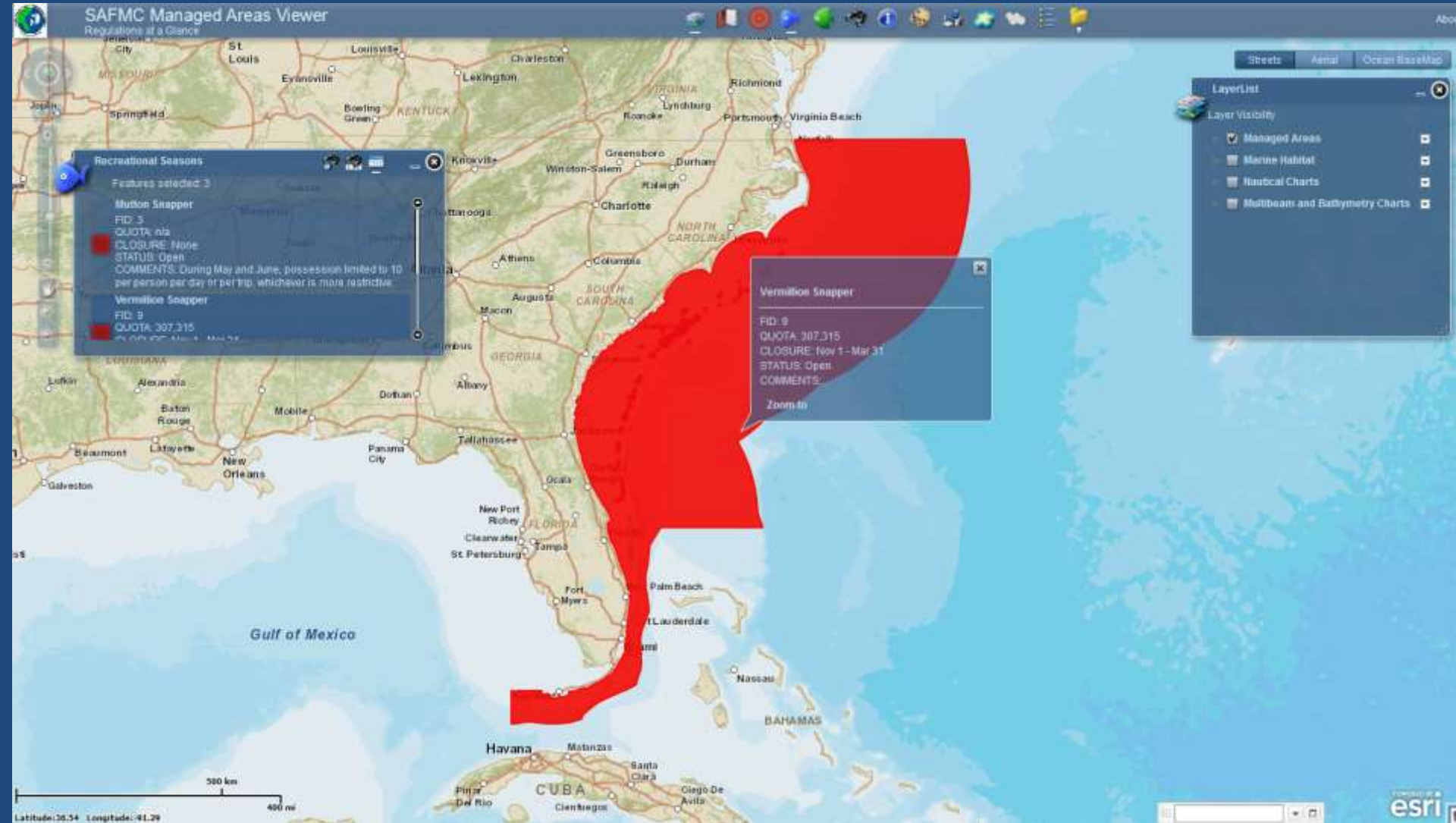
Pourtales Terrace CHAPC



Recreational Restrictions



Recreational Restrictions



Search - graphical

The screenshot displays the SAFMC Managed Areas Viewer web application. The interface includes a search panel on the left, a map of the Atlantic Ocean region, and a layer list on the right.

Search Panel:

- Search layer: Special Management Zones
- Select features by: [Icons for various search methods]
- Draw Rectangle
- Clear

Map:

- Geographic area: Atlantic Ocean, Gulf of Mexico, Florida, and parts of the United States and Mexico.
- Key features: Hatteras Plain, Bermuda Rise, Sargasso Sea, West Florida Escarpment, Florida Keys, Florida Straits, The Bahamas, Great Bahama Bank, Bermuda Escarpment, Nares Plain, Mexico Basin, Campeche Escarpment, Yucatan Shelf, Yucatan, Cuba, Florida, Miami, Tampa, Orlando, Atlanta, Charlotte, United States.
- Search results: A red rectangle highlights a cluster of purple dots on the Florida coast.

Layer List:

- Layer Visibility
- Managed Areas
- Marine Habitat
- Nautical Charts
- Multibeam and Bathymetry Charts

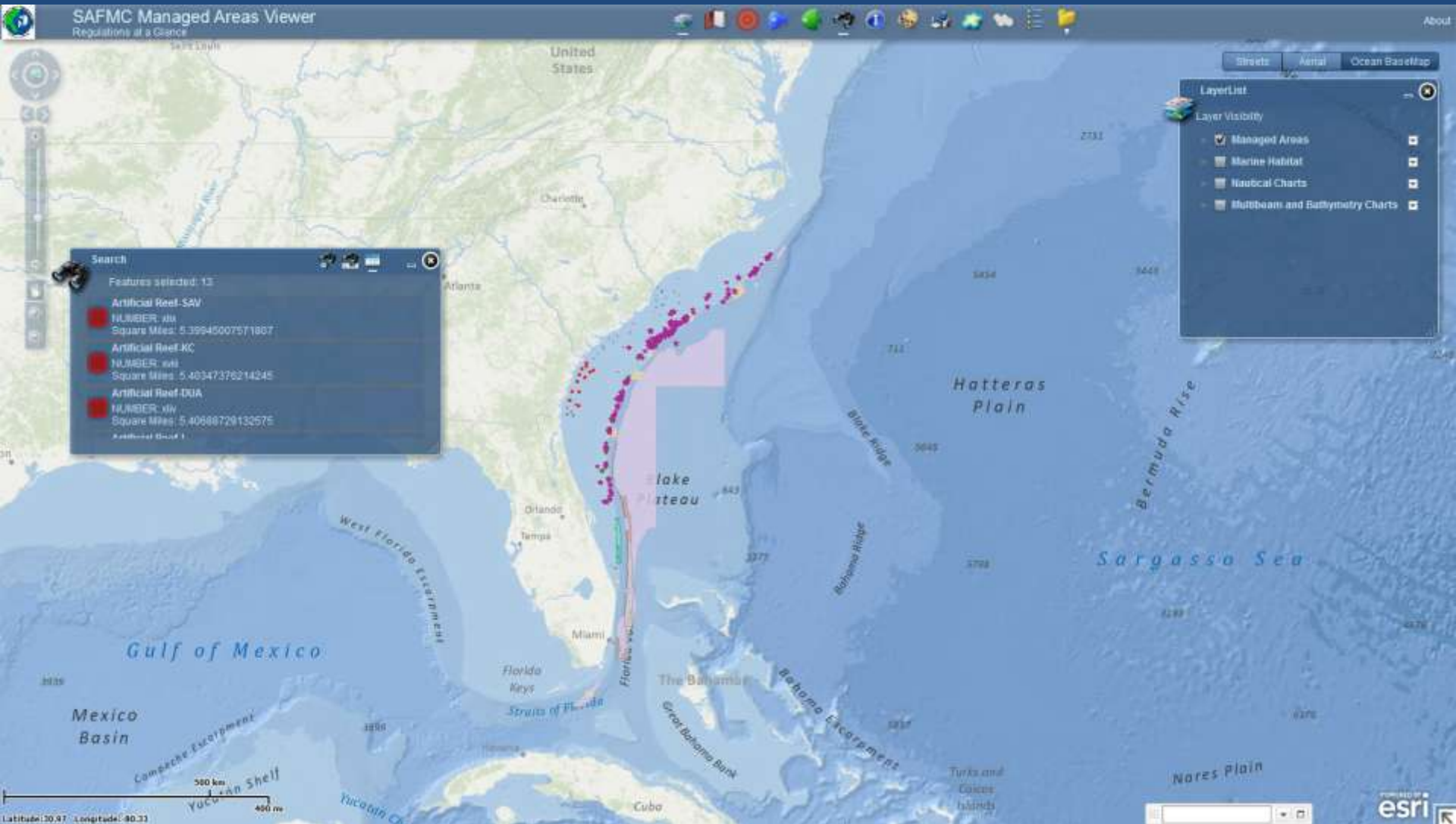
Map Controls:

- Map Style: Streets, Aerial, Ocean BaseMap
- Map Navigation: Zoom in, Zoom out, Home, Full Screen, etc.

Footer:

- Latitude: 32.02, Longitude: -84.33
- esri logo

Search results



Search results

The screenshot displays the SAFMC Managed Areas Viewer interface. The title bar reads "SAFMC Managed Areas Viewer" with the subtitle "Regulations at a Glance". The application features a top toolbar with various icons, a search panel on the left, a layer list on the right, and a central map area. The search panel shows three results:

- Artificial Reef SAV
NUMBER: sv
Square Miles: 5.39945007571867
- Artificial Reef KC
NUMBER: kv
Square Miles: 5.40347376214245
- Artificial Reef DUA
NUMBER: vw
Square Miles: 5.40666729132575

A large red square highlights the area corresponding to the selected result, Artificial Reef KC. A tooltip for this area displays the following information:

- Artificial Reef KC
- NUMBER: kv
- Square Miles: 5.40347376214245
- Zoom to

The layer list on the right shows the following layers:

- Managed Areas
- Marine Habitat
- Nautical Charts
- Multibeam and Bathymetry Charts

A scale bar at the bottom left indicates a distance of 2 km, with coordinates Latitude: 21.85 and Longitude: -80.74. The Esri logo is visible in the bottom right corner.

Search by attribute

The screenshot displays the SAFMC Managed Areas Viewer interface. The main map shows the Gulf of Mexico and the Atlantic Ocean, with various managed areas highlighted in pink and purple. A search window is open on the left, showing the search layer set to 'Deepwater Snapper Grouper MPA' and the search term 'Florida'. The search results are displayed as a series of colored dots along the Florida coast. A layer list on the right shows the 'Managed Areas' layer is checked and visible. The interface includes a search bar, a search button, and a clear button. The map also shows various geographical features like the Hatteras Plain, Bermuda Rise, and Sargasso Sea.

SAFMC Managed Areas Viewer
Regulations at a Glance

Search
Search Layer: Deepwater Snapper Grouper MPA
Search by Name (Example: North Florida MPA or Florida)
Florida
Search Clear

LayerList
Layer Visibility
 Managed Areas
 Marine Habitat
 Nautical Charts
 Multibeam and Bathymetry Charts

United States
Washington, D.C.
Cincinnati
Charlotte
Atlanta
Orlando
Tampa
Miami
Florida Keys
Straits of Florida
The Bahamas
Great Bahama
Bahama Escarpment
Hatteras Plain
Bermuda Rise
Sargasso Sea
Gulf of Mexico
Mexico Basin
West Florida Escarpment
Florida Escarpment

Latitude: 30.37 Longitude: -84.29

esri

Search by attribute

The screenshot displays the SAFMC Managed Areas Viewer interface. The main map shows the Gulf of Mexico and Florida coastline. Two search results are visible in the left sidebar:

- Northern South Carolina MPA
Square Miles: 66,491,123,969
- North Florida MPA
Square Miles: 137,237,588,127

The North Florida MPA result is selected, and a detailed popup window is open over it, showing:

- North Florida MPA
- Square Miles: 137,237,588,127
- [fbo/OceanFrontier.gov/ETH_Coralline/001_images/MPAs/2004_FL1_3.jpg](#)
- Zoom to

The LayerList on the right shows the following layers:

- Managed Areas (checked)
- Marine Habitat
- Nautical Charts
- Multibeam and Bathymetry Charts

The application title is "SAFMC Managed Areas Viewer" with the subtitle "Regulations at a Glance". The Esri logo is in the bottom right corner.

North Florida MPA

The screenshot displays the SAFMC Managed Areas Viewer web application. The main map shows the North Florida MPA highlighted in orange. A search panel on the left lists two selected features: Northern South Carolina MPA (66,491,123,950 square miles) and North Florida MPA (137,237,588,127 square miles). A popup window for the North Florida MPA provides details, including a URL to the EPA's CoralReef.org website. The interface also features a layer list on the right, a search bar at the top, and a scale bar at the bottom left.

SAFMC Managed Areas Viewer
Regulations at a Glance

Streets Aerial Ocean BaseMap

LayerList

Layer Visibility

- Managed Areas
- Marine Habitat
- Nautical Charts
- Multibeam and Bathymetry Charts

Search

Features selected: 2

- Northern South Carolina MPA
Square Miles: 66,491,123,950
- North Florida MPA
Square Miles: 137,237,588,127

North Florida MPA

Square Miles: 137,237,588,127

http://coralreef.fondamoney.epa.gov/CoralReef.org/images/MPAs/2014_FL_1.jpg

Scale: 10 km

Latitude: 31.23 Longitude: -81.47

esri

North Florida MPA - link



Identify – add Marine Habitats

The screenshot displays the SAFMC Managed Areas Viewer interface. The main map shows the Florida coastline with various marine habitats highlighted in red and purple. Key geographical features labeled include the West Florida Escarpment, De Soto Valley, Jacksonville, Orlando, Tampa, Lake (Neusehatchee), Florida Gap, Little Bahama Bank, Blake Plateau, and Blake Ridge. An 'Identify' tool window is open on the left, and a 'LayerList' panel is on the right. The 'LayerList' panel shows several layers, with 'Marine Habitat' highlighted in a red box. The 'Identify' tool window contains the text: 'Use the identify tool to identify features on the map.' and includes icons for identify, zoom, pan, and clear. The bottom left corner shows a scale bar (0 to 700 km) and coordinates (Latitude: 30.59, Longitude: -74.59). The bottom right corner features the Esri logo and the text 'POWERED BY esri'.

SAFMC Managed Areas Viewer
Regulations at a Glance

Identify
Use the identify tool to identify features on the map.

LayerList
Layer Visibility

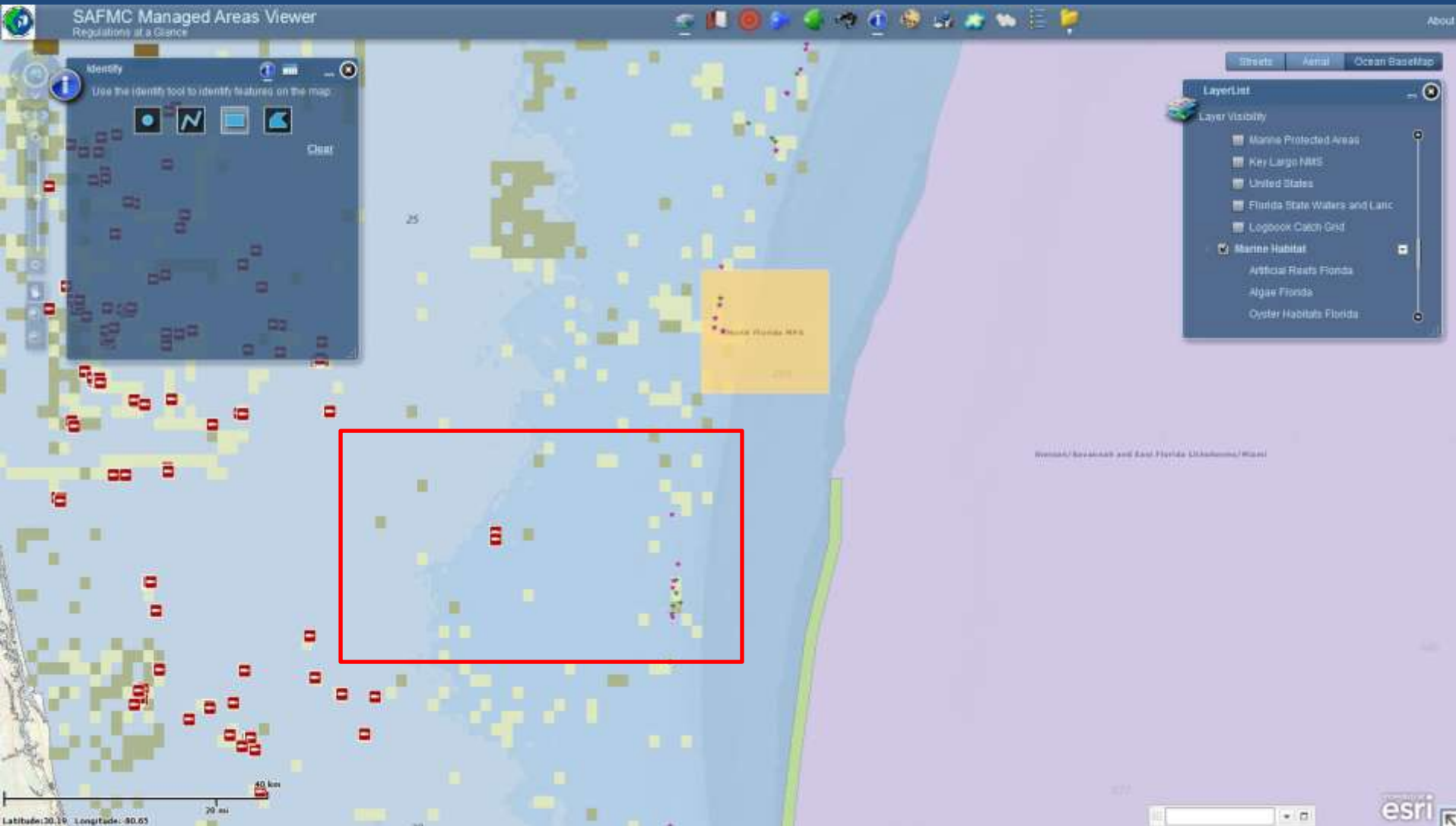
- Marine Protected Areas
- Key Largo FMS
- United States
- Florida State Waters and Land
- Logbook Catch Grid
- Marine Habitat**
- Artificial Reefs Florida
- Algae Florida
- Oyster Habitats Florida

West Florida Escarpment
De Soto Valley
Jacksonville
Orlando
Tampa
Lake (Neusehatchee)
Florida Gap
Little Bahama Bank
Blake Plateau
Blake Ridge

0 700 km
0 700 mi
Latitude: 30.59 Longitude: -74.59

POWERED BY esri

Identify features with a rectangle



Identify results

The screenshot displays the SAFMC Managed Areas Viewer interface. The main map area shows a coastal region with various habitat polygons. A large 'Identify' panel is open on the left, listing five results for 'Coral and Hard Bottom Habitats Florida'. Each result includes metadata such as Shape (Polygon), Source Metadata Title (SEAMAP Grid), SHAPE.area, SHAPE.len, OBJECTID, Source Date (1950's-1990's), and Habitat Type Description (Hardbottom). A smaller 'Info' popup is also visible over a specific polygon on the map, providing similar metadata. On the right side, a 'LayerList' panel is open, showing a list of layers with visibility checkboxes and sliders. The top navigation bar includes 'Streets', 'Aerial', and 'Ocean BaseMap' options. The bottom of the screen shows a scale bar (0 to 40 km) and coordinate information (Latitude: 29.37, Longitude: -80.54).

SAFMC Managed Areas Viewer
Regulations at a Glance

Identify

- Coral and Hard Bottom Habitats Florida
Shape: Polygon
Source Metadata Title: SEAMAP Grid
SHAPE.area: 3976046.45621
SHAPE.len: 7996.614901
OBJECTID: 377
Source Date: 1950's-1990's
Habitat Type Description: Hardbottom
- Coral and Hard Bottom Habitats Florida
Shape: Polygon
Source Metadata Title: SEAMAP Grid
SHAPE.area: 3976054.264054
SHAPE.len: 7996.630801
OBJECTID: 378
Source Date: 1950's-1990's
Habitat Type Description: Hardbottom
- Coral and Hard Bottom Habitats Florida
Shape: Polygon
Source Metadata Title: SEAMAP Grid
SHAPE.area: 3974337.036959
SHAPE.len: 7995.115901
OBJECTID: 379
Source Date: 1950's-1990's
Habitat Type Description: Hardbottom
- Coral and Hard Bottom Habitats Florida
Shape: Polygon
Source Metadata Title: SEAMAP Grid
SHAPE.area: 3976721.158054
SHAPE.len: 7997.340001
OBJECTID: 380
Source Date: 1950's-1990's
Habitat Type Description: Hardbottom
- Coral and Hard Bottom Habitats Florida
Shape: Polygon
Source Metadata Title: SEAMAP Grid
SHAPE.area: 3978855.817999
SHAPE.len: 7996.790301
OBJECTID: 382
Source Date: 1950's-1990's
Habitat Type Description: Hardbottom

Info

Coral and Hard Bottom Habitats-Florida
Shape: Polygon
Source Metadata Title: SEAMAP Grid
SHAPE.area: 3974337.036959
SHAPE.len: 7995.115901
OBJECTID: 379
Source Date: 1950's-1990's
Habitat Type Description: Hardbottom
Zoom to

LayerList

Layer Visibility

- Marine Protected Areas
- Key Largo NMS
- United States
- Florida State Waters and Land
- Logbook Catch Grid
- Marine Habitat
 - Artificial Reefs Florida
 - Algae Florida
 - Oyster Habitats Florida

0 20 40 km





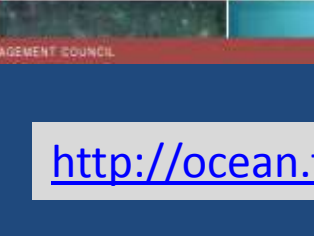

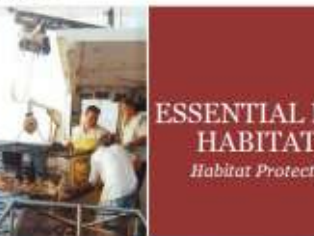



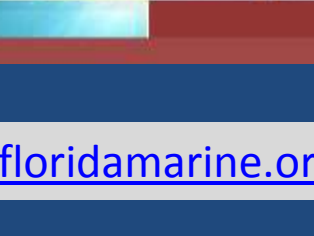





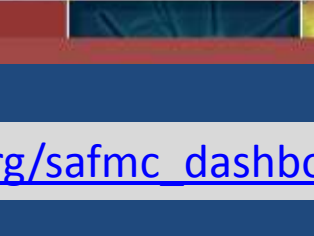

Latitude: 29.37, Longitude: -80.54

esri

Phase 8 - SAFMC Digital Dashboard

- SAFMC requested a “Digital Dashboard” to integrate links to all their collaborative projects and build connections to regional partners.
- The dashboard approach is a useful way to enhance the accessibility, usability, and visibility of state and regional efforts

SAFMC DIGITAL DASHBOARD INTEGRATING MANAGEMENT RESOURCES

 <p>SAFMC <i>Digital Dashboard</i></p>	 <p>ESSENTIAL FISH HABITATS <i>Habitat Protection</i></p>	 <p>ECO-SPECIES <i>Life Histories</i></p>	 <p>MANAGED AREAS <i>Regulations at a glance</i></p>	 <p>SA FISHERIES <i>Monitoring Programs</i></p>	 <p>FISHERY ECOSYSTEM PLANS <i>Habitat and Species</i></p>
 <p>NATIONAL COASTAL ASSESSMENT <i>Goals</i></p>	 <p>FISH DISTRIBUTION <i>coming soon</i></p>	 <p>FISHERY ALERT SYSTEM <i>coming soon</i></p>	 <p>OCEAN ENERGY <i>Digital Dashboard</i></p>	 <p>FISH HABITAT ACTION PLAN <i>Action Plan</i></p>	
 <p>FISH HABITAT ACTION PLAN <i>Action Plan</i></p>					

http://ocean.floridamarine.org/safmc_dashboard

SAFMC

Digital Dashboard










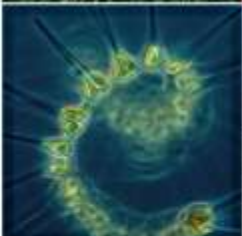



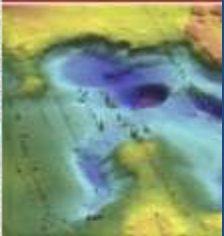

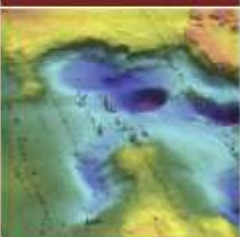




We envision our "Digital Dashboard" as a new approach to integrate links to our regional projects and build connections with our partners.

A dashboard is a useful way to enhance the accessibility, ease of use and visibility of the systems while highlighting and building connections to other state and regional efforts.

The dashboard is just getting started. We will expand the capabilities and links as they become available.

SAFMC DIGITAL DASHBOARD INTEGRATING MANAGEMENT RESOURCES

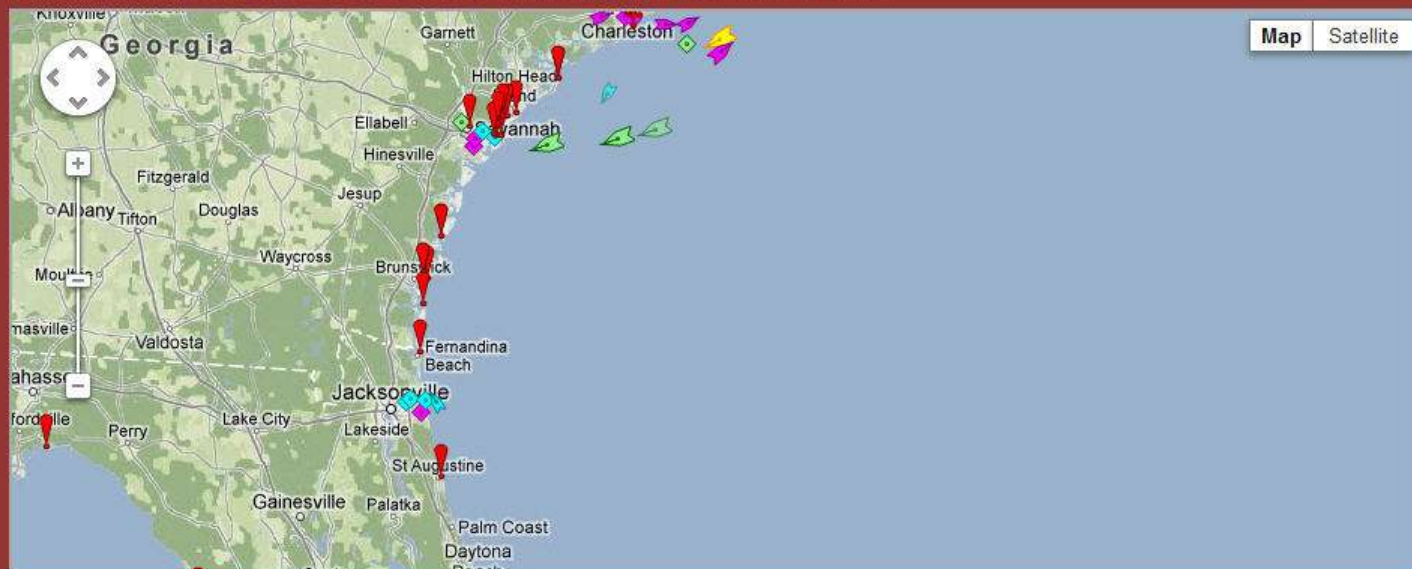
 <p>SAFMC <i>Digital Dashboard</i></p>		 <p>ESSENTIAL FISH HABITATS <i>Habitat Protection</i></p>	 <p>ECO-SPECIES <i>Life Histories</i></p>	
 <p>MANAGED AREAS <i>Regulations at a glance</i></p>		 <p>SA FISHERIES <i>Monitoring Programs</i></p>	 <p>FISHERY ECOSYSTEM PLAN <i>Habitat and Species</i></p>	
 <p>NATIONAL COASTAL ASSESSMENT <i>Goals</i></p>		 <p>FISHERY ALERT SYSTEM <i>coming soon</i></p>		
 <p>FISH DISTRIBUTION <i>coming soon</i></p>		 <p>OCEAN ENERGY <i>Digital Dashboard</i></p>	 <p>FISH HABITAT <i>Action Plan</i></p>	

MARINE TRAFFIC



Southeast Atlantic Coast

This map provides information about current geographical positions of ships as well as other related information, whenever available, such as ships' details, their destination, estimated time of arrival, or photographs.



SA FISHERIES

Monitoring Programs







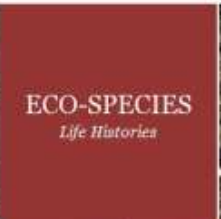











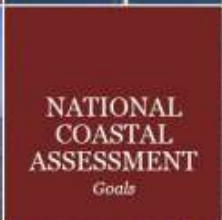




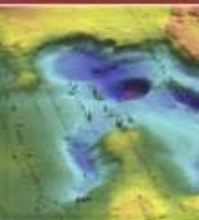


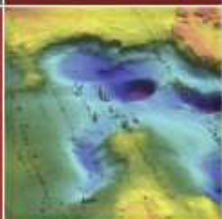

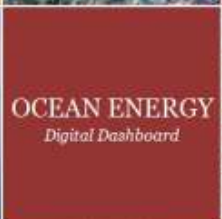



This prototype application was developed for the South Atlantic Fishery Management Council (SAFMC) with ArcGIS Viewer for Flex. It displays fishery independent data collected by the SEAMAP - South Atlantic (SA) component and by the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) program. The application also contains several base layers and data from EcoGIS.

The SA Fisheries viewer currently serves SEAMAP species data, MARMAP species data, MARMAP gear types, bathymetry, and boundaries for the continental shelf, US Federal State and US Territorial Seas.

The SA Fisheries viewer is accessible via the following:

http://ocean.floridamarine.org/SA_Fisheries/

SAFMC DIGITAL DASHBOARD INTEGRATING MANAGEMENT RESOURCES

 <p>SAFMC <i>Digital Dashboard</i></p>			 <p>ESSENTIAL FISH HABITATS <i>Habitat Protection</i></p>			 <p>ECO-SPECIES <i>Life Histories</i></p>	
	 <p>MANAGED AREAS <i>Regulations at a glance</i></p>			 <p>SA FISHERIES <i>Monitoring Programs</i></p>			 <p>FISHERY ECOSYSTEM PLAN <i>Habitat and Species</i></p>
		 <p>NATIONAL COASTAL ASSESSMENT <i>Goals</i></p>			 <p>FISHERY ALERT SYSTEM <i>coming soon</i></p>		
	 <p>FISH DISTRIBUTION <i>coming soon</i></p>			 <p>OCEAN ENERGY <i>Digital Dashboard</i></p>			 <p>FISH HABITAT <i>Action Plan</i></p>



PLANNING AHEAD



SUSTAINABLE FISHERIES

Recent Updates

- Created polygon shapefile to represent the new Tilefish EFH-HAPC
- Created new focal species general and spawning areas based on ETOPO1 DEM
- Created SEAMAP-SA data points for select SAFMC managed species
- Updated MARMAP species data for SAFMC managed species
- South Atlantic Public Notices for FY 2011
- Sante Pax locations
- Ideas for sharing map services on ESRI iPhone app

Accessing FWC GIS layers with your iPhone

- Install the free 'ESRI ArcGIS' application from the App Store.
- Tap the magnify glass to find maps
- Search for 'FWC Marine'
- Tap to open the map
- Adjust data layer visibility with the 'i' button
- Toggle layers on and Off



Coming Soon

- **Map services expose feature attachments**
 - upload and associate files with certain geographic features in your map. Examples of attachments could include TXT, PDF, or image files that contain supplemental information about the feature. When you publish your map as a service, clients can see and download the attachments.
- **Map services can expose relates and stand-alone tables**
 - Map services now expose information about relates and stand-alone tables. (with EcoSpecies)
- **Security for map services (?) – via ArcGIS Online subscription service or Security certificate on production server**
- **Cached services for Multibeam and Nautical Charts**
- **More Widgets! – code sample at ESRI growing**

Benefits of caching

Nautical charts and multibeam services could be cached to improve performance



ArcGIS Online

- [ArcGIS Online](#) is a cloud-based, collaborative content management system for maps, apps, data, and other geographic information.

Resource Center Show: Web Content Only Tina Udouj Notifications Help Sign Out

ArcGIS GALLERY MAP GROUPS **MY CONTENT** Find maps, applications and more...

My Content

Using 0% of 2GB

<input type="checkbox"/>	▲ Title	Type	Modified	Shared	Size
<input type="checkbox"/>	 SAFMC EFH	Web Mapping Application	Nov 16, 2011	Not Shared	1 KB
<input type="checkbox"/>	 SAFMC EFH	Web Map	Nov 16, 2011	Everyone	1 KB
<input type="checkbox"/>	 SAFMC Fishery	Web Map	May 2, 2012	Everyone	1 KB
<input type="checkbox"/>	 SAFMC_Fishery	Map Service	May 2, 2012	Everyone	1 KB
<input type="checkbox"/>	 SEAMAP Catch Data	Web Map	May 2, 2012	Everyone	1 KB

ArcGIS Online Subscription Services

ArcGIS Online Plan	Named Users Included	Credits Included	Annual Subscription
Small Workgroup	5	2500	\$2,500
Medium Workgroup	50	10,000	\$10,000
Large Workgroup	100	17,500	\$17,500
Department	250	37,500	\$37,500
Large Department	500	62,500	\$62,500
Multi-Department	1000	110,000	\$110,000

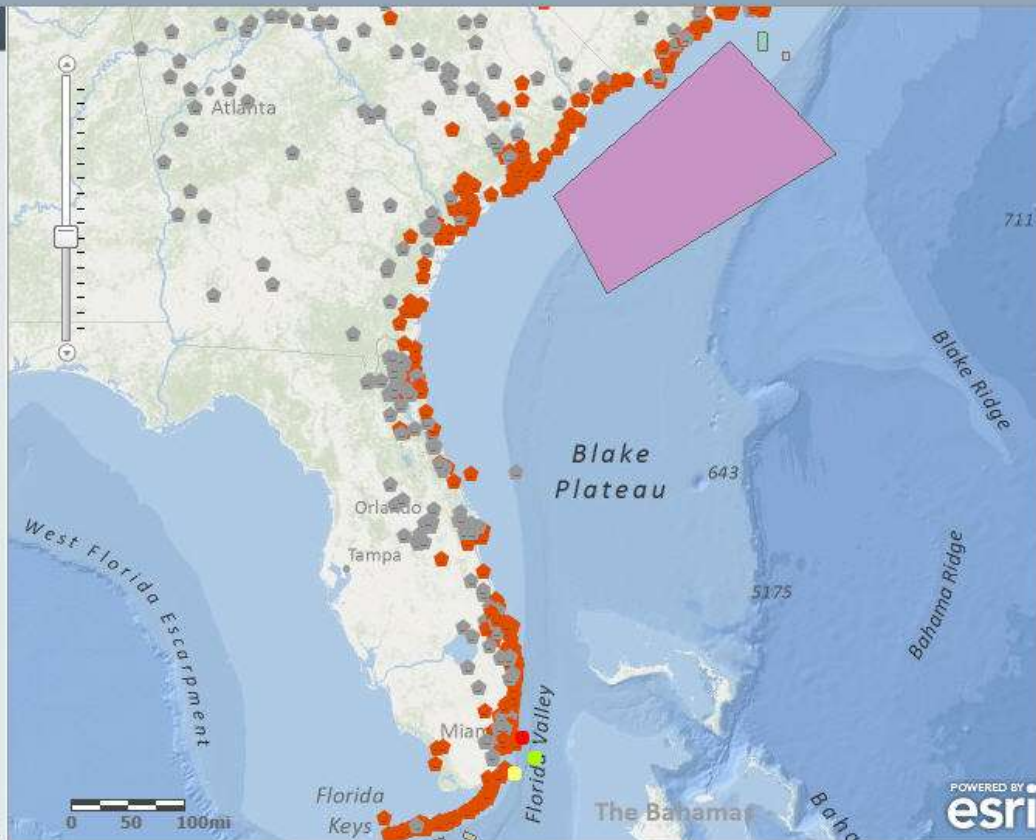
Credits are used to perform many common functions with AGOL maps, apps, and data, such as mass geocoding, creating tiled services, data transfers, and so forth. From Keith Cooke [<mailto:kcooke@esri.com>] ESRI Rep in SE

ArcGIS.com – EFH web app

SAFMC EFH

displays basic maps for EFH and EFH-HAPC

Description



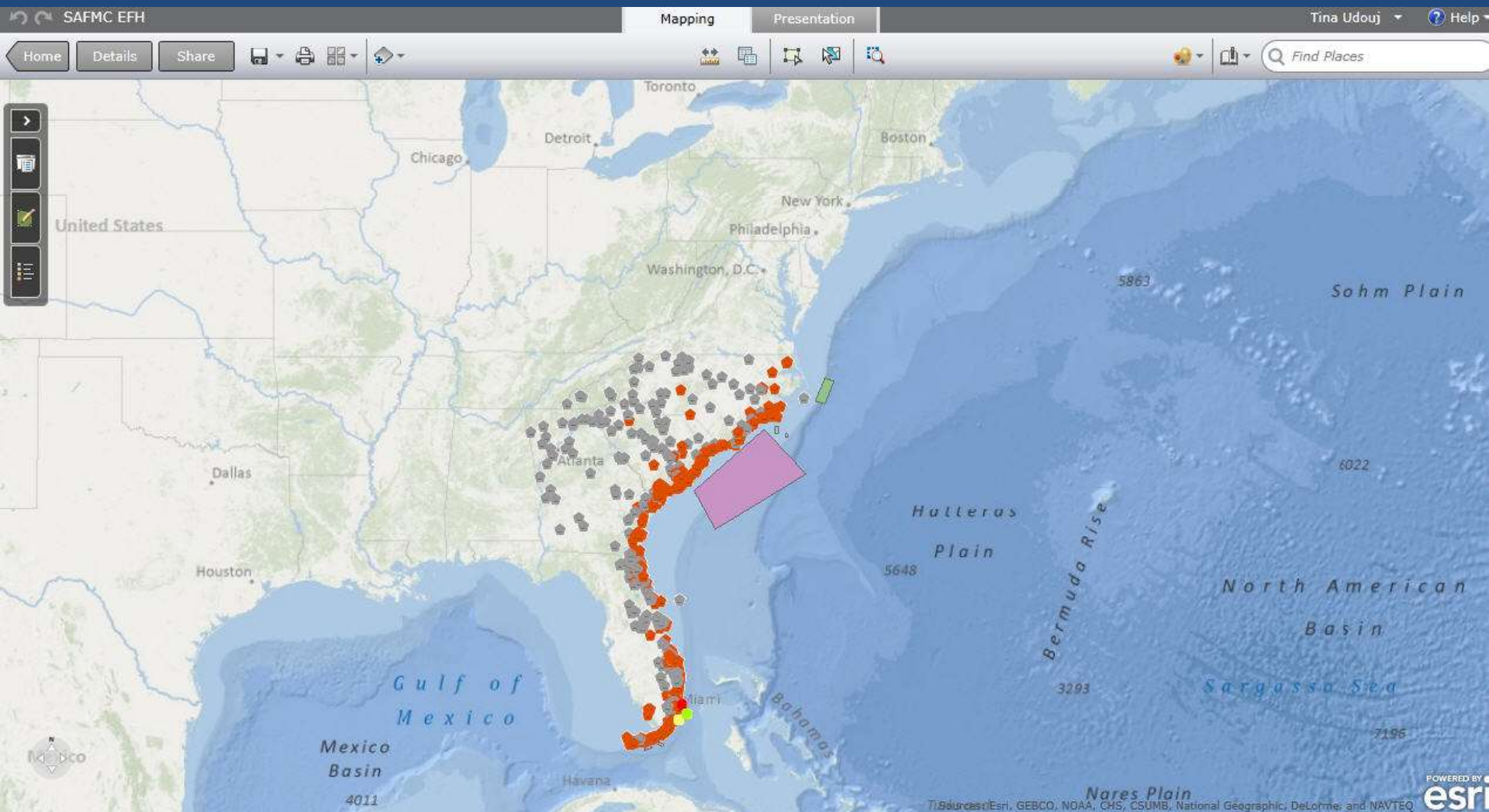
Identify

SAFMC_EFH

South Atlantic Public Notices
FY2011

FID: 433
Index: 44
NoticeDate: 12/2/2010
ResponseDa: 2/1/2011
ProjectNum: 1997-6823, Volusia County
Artificial Reef Program
State: FL
County: Volusia
TypeWork: Fish habitat enhancement
WaterwayLo: Atlantic Ocean
Consultat: No Staffing
EFHPresent: EFH Present
EFHffects: Would not have
Latitude: 29.12583
Longitude: -80.6875

ArcGIS Online Explorer

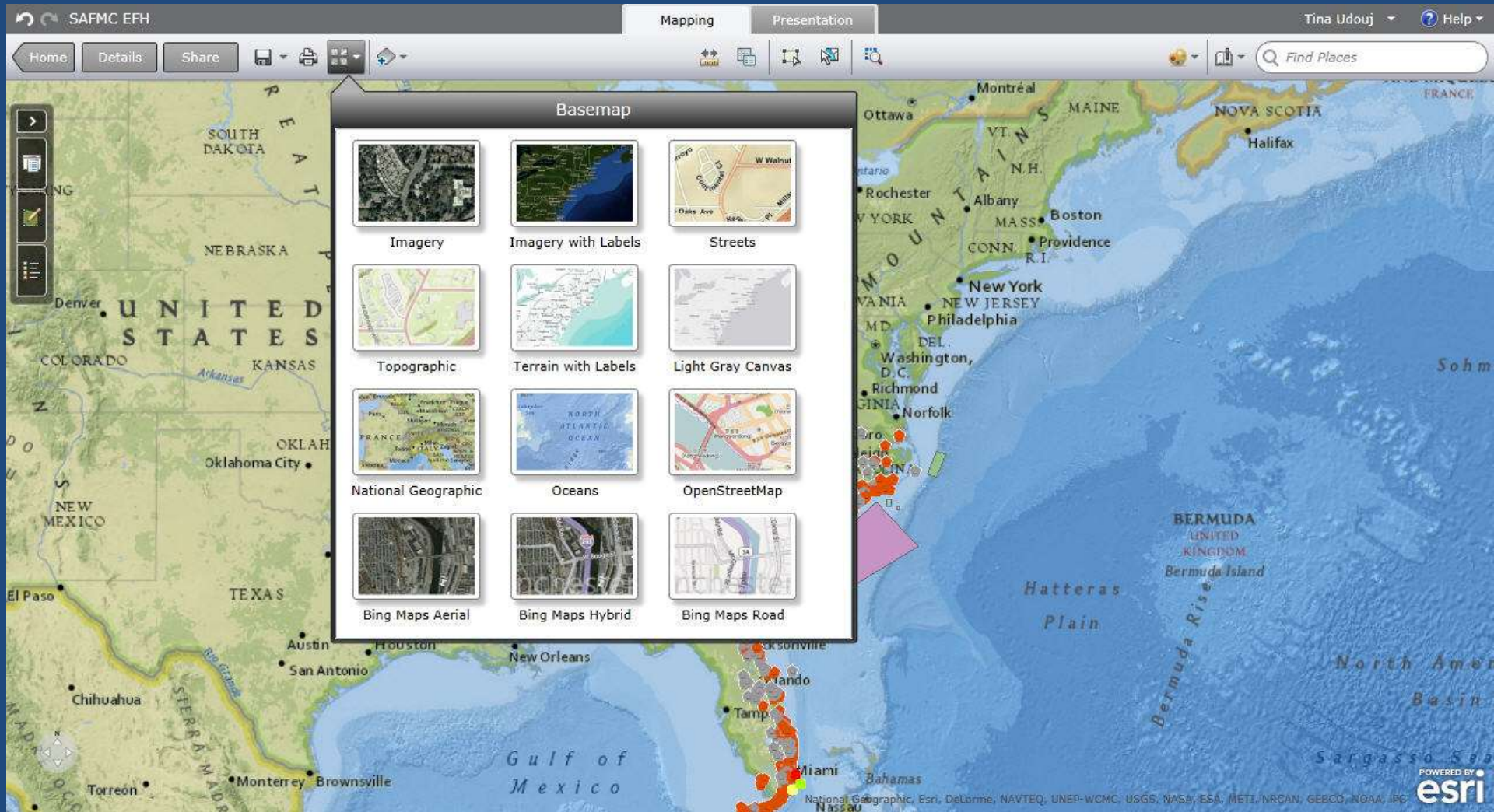


ArcGIS Online Explorer

The screenshot displays the ArcGIS Online Explorer interface. At the top, the user is logged in as 'Tina Udouj' and is in the 'Mapping' tab. The main map area shows a bathymetric view of the Atlantic Ocean, with various oceanic features labeled such as 'Sohm Plain', 'Hatteras Plain', 'North American Basin', 'Sargasso Sea', 'Bermuda Rise', and 'Nares Plain'. A pink rectangular area is highlighted on the map, and a series of red and orange points are plotted along the eastern coast of the United States. On the left side, the 'Add Content' panel is open, showing three options: 'CSV' (Create features from a .csv file), 'Shapefile' (Create features from a shapefile), and 'GPX' (Create features from a .gpx file). The interface includes a search bar at the top right and a navigation pane on the left.

Add content from .csv, shapefile or a GPS file

ArcGIS Online Explorer



Change basemaps

ArcGIS Online Explorer

The screenshot displays the ArcGIS Online Explorer interface. The top navigation bar includes 'Home', 'Details', and 'Share' buttons. The main map area shows a geographical view of the United States. A 'Share' dialog box is open in the center, titled 'SAFMC EFH'. The dialog box contains the following sections:

- Share this Map**: A section for choosing access permissions. The 'Everyone (public)' option is selected with a checked checkbox. Below it is a text input field for 'The members of these groups:'.
- Behavior**: A section with a checkbox for 'Start in presentation mode when opened by others', which is currently unchecked.
- Links**: A section for sharing the map. It includes a text input field for the map link: 'http://www.arcgis.com/explorer/?...'. To the right of this field are social media icons for Facebook and Twitter, and a 'Copy' button. Below this is another text input field for the presentation link: 'http://www.arcgis.com/explorer/?...', also with social media icons and a 'Copy' button.
- Embed**: A section with the text 'Embed the map into a webpage or a blog as HTML' and an 'Embed' button.

The background map shows the United States with various states and cities labeled, including Minneapolis, Kansas City, Saint Louis, Dallas, Houston, San Antonio, Austin, Chihuahua, Monterrey, Brownsville, and Toronto. The Gulf of Mexico is visible at the bottom.

Share map via social media

ArcGIS Online Explorer

The screenshot displays the ArcGIS Online Explorer interface. At the top, the user is logged in as 'Tina Udouj'. The interface includes a navigation bar with 'Home', 'Details', and 'Share' buttons, and a toolbar with various map controls. The 'Presentation' tab is highlighted with a red box. The main map area shows a satellite-style map of the Charleston, South Carolina area, with a large black overlay box containing the text 'Charleston Area'. The map includes labels for various locations such as Moncks Corner, Summerville, Ladson, Goose Creek, Hanahan, North Charleston, Charleston, Mount Pleasant, Ravenel, and Hollywood. It also shows major roads like I-26 and I-78, and airports like Charleston AFB Intl Airport and Charleston Executive Airport. The bottom of the interface features a slide show navigation bar with two thumbnails labeled '1' and '2', indicating the current slide in the presentation.

Switch to presentation mode to make a slide show

Let's Explore

SAFMC HABITAT AND ECOSYSTEM VIEWER