



SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

# SAFMC Ecosystem Tools

Roger Pugliese  
Senior Fishery Biologist, SAFMC

Healthy Ecosystems Team  
2013 Governor's South Atlantic Alliance Meeting

September 5, 2013

Raleigh, North Carolina



....*To Conserve and Manage*



SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

# SAFMC Digital Dashboard

## SAFMC GIS Services

## SAFMC Ecospecies

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# SAFMC DIGITAL DASHBOARD



# SAFMC Digital Dashboard

- SAFMC created 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



# Dashboard Design

- New template based on the Bootstrap framework
- Easy to manage and modify
- More capabilities to expand
- Clean and simple interface
- Responsive design (looks nice on mobile devices too!)



# Digital Dashboard

The entry page for the dashboard serves as a launch pad for the main SAFMC web mapping applications:

1. Fisheries and Species Occurrence
2. Regulations and Managed Areas
3. EFH and EFH-HAPC
4. Habitat and Ecosystem

## SAFMC Digital Dashboard

[Home](#) [GIS Data](#) [Partners](#) [Contact Us](#)

Explore the marine and fishery resources of the South Atlantic Bight.



The fog lifts as the sun begins to rise by Amanda Harley

### Web Mapping Applications



#### Fisheries

This application displays fishery independent data collected by the STAMAP (South Atlantic) fishery component and by the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) program. The application also contains bathymetry, benthic habitats, local species areas, Ecoregions, and regulatory boundaries.

[View Project](#)



#### Managed Areas

This web application provides users an opportunity to view managed areas in the SAFMC's jurisdiction. The application contains data for the Atlantic Golden Crab Fishery Area, Shrimp Fishery Access Area, and Deepwater Coral HAPCs. The application also includes SAFMC Reservations, Marine Protected Areas, Coastal OHPs, Danger Zones, and other Federal Marine Managed Areas.

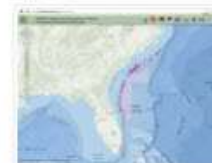
[View Project](#)



#### Essential Fish Habitat

You can access interactive maps of EFH and HAPCs in the South Atlantic region using the SAFMC EFH Viewer. This application displays Essential Fish Habitat (EFH) and Essential Fish Habitat-Habitat Area of Particular Concern (EFH-HAPC) for several species under SAFMC's jurisdiction. It also displays EFH for Highly Migratory Species (HMS) managed by NOAA Fisheries.

[View Project](#)



#### SAFMC Habitat and Ecosystem Atlas

The SAFMC Regional Habitat and Ecosystem Atlas is here! The SAFMC Habitat and Ecosystem Atlas is a comprehensive site to view a variety of map services supporting fishery management issues in the South Atlantic Bight.

[View Project](#)

### Links

[South Atlantic Fishery Management Council](#)  
[Fish and Wildlife Research Institute](#)  
[Atlantic States Marine Fisheries Commission](#)  
[Southeast Regional Fisheries Center](#)

### Connect With Us

The South Atlantic Fishery Management Council is now on Facebook and Twitter.



### Subscribe

Subscribe to our newsletter to get the latest news!



# GIS Data

The dashboard provides an interface to easily access GIS data relevant to SAFMC

Map  
services

Data  
Catalog

ArcGIS  
Online

Marine  
Traffic

MPA Story  
Map



# Map Services

The map services page provides a brief description of the core, complementary, and external map services used in SAFMC mapping applications. The images are linked to each of the map service's REST endpoint.

### Map Services

#### Core Services



##### Managed Areas

Contains data for the Allowable Guided Crab Fishery Areas, Shrimp Fishery Access Areas, Deepwater Coral HAPCs, SAFMC Restrictions, Marine Protected Areas, Danger Zones, and other Federal/State Managed Areas.



##### Fisheries

Serves SCAMAP species data, MARMAP species data, WRMAP gear types, bathymetry, and boundaries for the continental shelf, US Federal State and US Territorial Seas.



##### Essential Fish Habitat (EFH)

Displays Essential Fish Habitat (EFH) and Essential Fish Habitat Habitat Areas of Particular Concern (EFH-HAPCs) for several species under SAFMC's jurisdiction.

#### Complementary Services



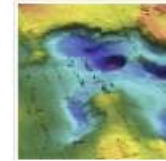
##### Habitats

Displays habitat data collected by SEADEIC, Harbor Branch Oceanographic Institute (HBOI) and Ocean Exploration Atlas, as well as the SEAMAP and/or ESCM deepwater bottom mapping projects, multibeam imagery, and scientific cruise data.



##### Nautical Charts

Displays coastal, general, and overview nautical charts for the SAFMC's jurisdictional area. Although updated charts are available from NOAA's RNC map service, SAFMC has found the LOAN lines displayed on older charts helpful in public workshop forums.



##### Multibeam

Displays a variety of multibeam data sources and scanned bathymetry charts. Data sets from NOAA's Deep Sea Coral Mission, Southeast Factory-Independent Survey (SEFIS), and Harbor Branch Oceanographic Institute (HBOI) are included.

#### External Services



##### NOAA's Estuarine Bathymetry

Estuarine bathymetry was developed by the Special Projects Office of the National Ocean Service (NOS) as part of a project to produce newly available bathymetry. Seventy of the approximately 130 estuaries within the continental U.S. are available from this site.



##### South Carolina Energy

A task force has been convened by the Department of Interior's Bureau of Ocean Energy Management to discuss the designation of wind energy planning areas in federal waters off the coast of South Carolina. This map includes many of the data layers being used by the South Carolina Renewable Energy Task Force in their decision making process.



##### DEM Hillshade

Hillshade visualizations for high-resolution digital elevation models (DEMs) of select U.S. coastal regions. These integrated bathymetric topographic DEMs are used to support human forecasting and modeling efforts at the NOAA Center for Tautou Research, Pacific Islands Environmental Laboratory (PIEEL).

#### Links

- South Atlantic Fishery Management Council
- Fish and Wildlife Research Institute
- World State Marine Fisheries Commission
- Atlantic Regional Fisheries Council

#### Connect With Us

The South Atlantic Fishery Management Council is now on Facebook and Twitter.



#### Subscribe

Subscribe to our newsletter to get the latest news.





# REST service

The REST endpoint provides details for the map layers, spatial reference, geographic extent, and other supporting information.

Clicking on a layer will provide the user more information.

ARCREST Services Directory

Home > SOVSAS > NAME > NAME\_Regions (MapInfo) > Deepwater Coral HAPCs

Layer: Deepwater Coral HAPCs (ID: 13)

Parent Layer: [Deepwater Coral Habitat Areas of Particular Concern](#)

Name: Deepwater Coral HAPCs

Display Fields: null

Type: Feature Layer

Geometry Type: esriGeometryPolygon

Description: The Council's Habitat and Coral Advisory Panels proposed these areas at the October 2004 meeting and the Council approved the proposal at their December 2004 meeting. Management measures proposed by the SOFHC to help protect these sensitive habitats received approval from NOAA Fisheries Service and the Secretary of Commerce and became effective July 21, 2010. Five areas, located off the southeastern coast of the U.S. and encompassing more than 21,000 square miles (about the size of the State of West Virginia) have been designated Coral Habitat Areas of Particular Concern (Coral HAPCs). The designation efforts added protection to the areas that house an invaluable array of fish and invertebrate species, some of which may have biomedical applications in the treatment of human diseases.

Definition Expression:

Copyright Text:

Default Visibility: true

MaxRecordCount: 1000

Supported Query Formats: JSON, AMF

Min Scale: 0

Max Scale: 0

Supports Advanced Queries: false

Supports Statistics: false

Has Labels: true

Can Modify Layer: false

Can Scale Symbols: false

Extent:

XMin: -9031474.304883702  
YMin: 3775596.954236211  
XMax: -9425663.287482337  
YMax: 4084027.5110673158  
Spatial Reference: 552166 (3057)

Drawing Info:

Renderer:

Simple Renderer:

Symbol:

Style: esriSLSolid  
Color: [194, 138, 215, 255]  
Outline: null  
Style: esriSLSolid  
Color: [112, 68, 137, 255]  
Width: 1

Label:

Description:

Transparency: 40

Labeling Info:

Label Placement: esriServerPolygonPlacementAlwaysOnPoint  
Label Expression: [Name]  
Use Codes: false  
Use Symbols:

Color: [112, 68, 137, 255]  
Background Color: N/A  
Outline Color: N/A  
Vertical Alignment: bottom  
Horizontal Alignment: center  
Right to Left: false  
Angle: 0  
dXOffset: 0  
dYOffset: 0  
Size: 8  
Font Family: verdana  
Font Style: normal  
Font Weight: bold  
Font Decoration: none  
Min. Scale: 9992480.304883  
Max. Scale: 1000.0

HasZ: false

HasM: false

Has Attachments: false

HTML Popup Type: esriServerHTMLPopupTypeNone

Type ID Field: null

Fields:

- FID ( type: esriFieldTypeOID , alias: FID )
- Shape ( type: esriFieldTypeGeometry , alias: Shape )
- NAME ( type: esriFieldTypeString , alias: Name , length: 254 )
- AREA\_METR2 ( type: esriFieldTypeDouble , alias: Square Meters )
- AREA\_MILE2 ( type: esriFieldTypeDouble , alias: Square Miles )

Supported Operations: [Query](#) [Generate Thumbnail](#) [Details/Queries](#)



# Data Catalog

The data catalog page provides users an opportunity to download zipped shapefiles and accompanying metadata for SAFMC GIS data layers.

Google Earth files in the KMZ format are also available for select layers.

## 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).

Data Layer	Metadata	Data Download (Zip File)
Dolphin/Wahoo EFH	In Progress	Shapefile
Shrimp EFH	Metadata	Shapefile
Spiny Lobster EFH	Metadata	Shapefile
Coastal Migratory Pelagic EFH	Metadata	Shapefile
Golden Crab EFH	Metadata	Shapefile
Stripper Grouper EFH	Metadata	Shapefile
Coral, Coral Reef, Live or Hard Bottom EFH	Metadata	Shapefile

## 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, would 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 HAPCs have been mandated to use an ecosystem approach in managing the Nation's Fisheries. The Councils 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.

Data Layer	Metadata	Shapefile	Google Earth
Dolphin/Wahoo EFH-HAPC	Metadata	Zip File - 6 kb	KMZ
Coastal Migratory Pelagic EFH-HAPC	Metadata	Zip File - 238 kb	KMZ
Shrimp EFH-HAPC	Metadata	Zip File - 2 kb	KMZ
Spiny Lobster EFH-HAPC	Metadata	Zip File - 2.8 mb	KMZ
Stripper Grouper EFH-HAPC	Metadata	Zip File - 28 mb	KMZ
Coral, Coral Reef and Live or Hard Bottom EFH-HAPC	Metadata	Zip File - 2 mb	KMZ
Turtle EFH-HAPC	In progress	Zip File - 23kb	In progress

## Deepwater Coral Habitat Areas of Particular Concern (Coral HAPCs)

Deepwater Coral Habitat Areas of Particular Concern (Deepwater Coral HAPCs) have been designated off the coast of the southern Atlantic states in which the use of specified fishing gear and methods and the possession of coral is prohibited. Within the Deepwater Coral HAPCs, fishing areas have been established that allow continued fishing on the historical grounds, but prohibit trawl and deepwater shrimp. This designation protects what is thought to be the largest distribution of pristine deepwater coral ecosystems in the world.

	METADATA	Tab Delimited Coordinates	SHAPEFILE	GOOGLE EARTH
Deepwater Coral HAPCs	Metadata		Zip File - 11kb	KMZ
Cape Lookout		CapeLookout.txt		
Cape Fear		CapeFear.txt		
Stetson/Maria Terrace		StetsonMariaTerrace.txt		
Fourfars Terrace		FourfarsTerrace.txt		
Blake Ridge/Daguer		BlakeRidgeDaguer.txt		
Golden Crab Access Area A	GCAA_A.txt		Zip File - 6kb	KMZ
Golden Crab Access Area B	GCAA_B.txt		Zip File - 2kb	KMZ
Golden Crab Access Area C	GCAA_C.txt		Zip File - 3kb	KMZ
Golden Crab Northern Access Area	GCAA_Northern.txt		Zip File - 3kb	KMZ
Golden Crab Southern Access Area	GCAA_Southern.txt		Zip File - 3kb	KMZ
Shrimp Fishery Access Area A	SFAA_A.txt		Zip File - 3kb	KMZ
Shrimp Fishery Access Area B	SFAA_B.txt		Zip File - 3kb	KMZ
Shrimp Fishery Access Area C	SFAA_C.txt		Zip File - 3kb	KMZ
Shrimp Fishery Access Area D	SFAA_D.txt		Zip File - 3kb	KMZ

## Restricted Gear

The South Atlantic Fishery Management Council's (SAFMC) role is to develop fishery management plans needed to manage fishery resources within the Exclusive Economic Zone (EEZ) extending from state waters (three miles in the south Atlantic) to 200 nautical miles. The 1996 Sustainable Fisheries Act (SFA) was passed by Congress to protect marine fish stocks with requirements to prevent and stop overfishing, rebuild stocks, and protect habitat. These laws progressively reevaluate prohibitions on the use of various gear to fish for and retain stripper grouper species within the SAFMC EEZ.

Gear	METADATA	SHAPEFILE	GOOGLE EARTH
Roller Rig Tows	Metadata	Zip File - 70kb	KMZ
Sargassum	Metadata	Zip File - 75kb	KMZ
Black Sea Bass Pots	Metadata	Zip File - 30kb	KMZ
Bottom Longlines	Metadata	Zip File - 55kb	KMZ
Fish Traps	Metadata	Zip File - 70kb	KMZ
Ocher/Oran		Zip File - 48kb	KMZ

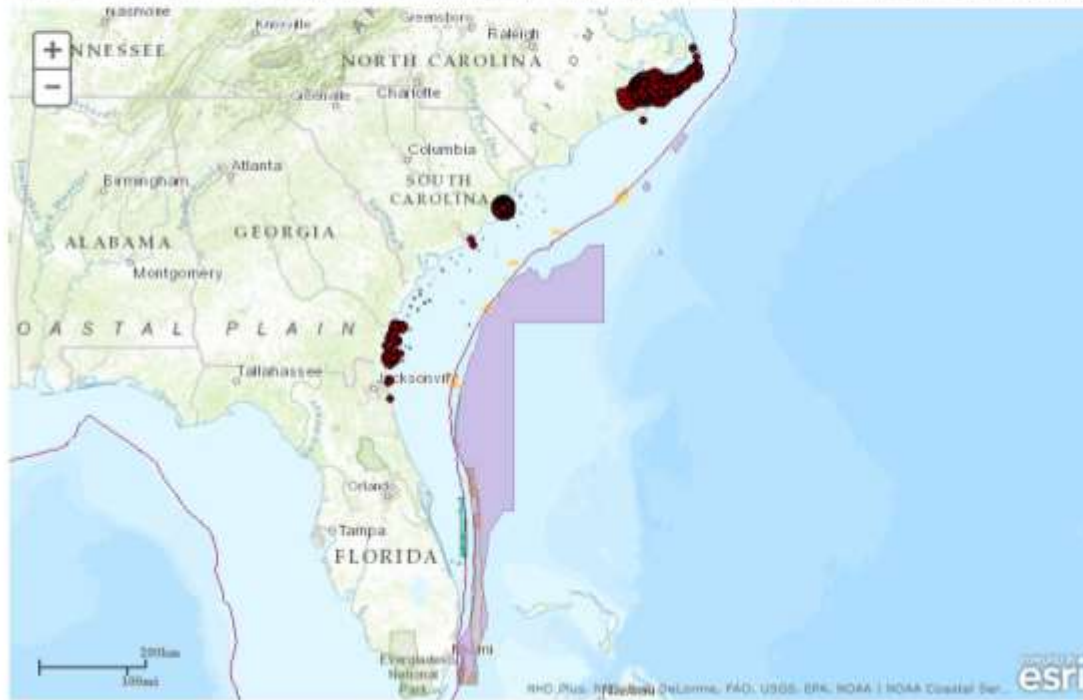


# ArcGIS Online

ArcGIS Online is a cloud-based, collaborative content management system for maps, apps, data, and other geographic information. The SAFMC is exploring how to use this technology to share data and maps more efficiently.

## Map Example

This ArcGIS Online map provides a mash-up of the SAFMC Managed Areas and Fisheries map services. Click on the link below the map to open it via ArcGIS Online.



[View Larger Map](#)

The ArcGIS Online page offers an alternative approach for interacting with SAFMC GIS services. The SAFMC is currently exploring how to use this technology to share data and maps more efficiently.



ArcGIS Online Maps

ArcGIS - Sharing Maps via ArcGIS Online

NEW MAP Tina

Details Add Basemap Save Share Print Measure Bookmarks Find address or place

About Content Legend

Contents

- SAFMC Fishery
  - Sea Floor Video
  - SEAMAP-SA Data
    - Age and Growth
    - Catch Data
    - Length Frequency
    - Blue Crab
    - HorseShoe Crab
    - Sharks
    - Shrimp
    - Stations
    - Turtles
    - Red Drum Longline
    - SAFMC Managed Sp
    - SCDNR Priority Spe
  - MARMAP Data
  - Southeast Bathymetry
  - Continental Shelf Boundary
  - EcoGIS
  - United States
- SAFMC Regulations
  - Speckled Hind and Warsaw Group Management
  - Undersea Feature Names
  - Maritime Limits United States
  - Southeast Bathymetry
  - Deepwater Snapper Group MPA's
  - Special Management Zones in the Southeast
  - Deepwater Coral Habitat Areas of Particular Concern
  - Oculina HAPC
  - SAFMC Restrictions
  - Danger Zones and Restricted Areas in the Southeast U.S. - 1998

Remove Pop-up  
Configure Pop-up  
Hide in Legend  
Hide Table  
Filter  
Description

(1 of 13)  
Catch Data: ATLANTIC CROAKER

Latitude 35.03  
Longitude -76.57  
Date June 12, 2011  
Event 1117766  
Collection 111776601  
Species Code 8835440701  
Common Name ATLANTIC CROAKER  
Total Number 6.00  
Total Weight (kg) 0.25  
Zoom to

June 30, 2009 to December 31, 2009

SAFMC Fishery - Catch Data (18,581 features, 13 selected)

Latitude	Longitude	Date	Event	Collection	Species Code	Common Name	Total Number	Total Weight (kg)
35.03	-76.57	June 12, 2011	1117766	111776601	8835440401	SPOT	55.00	2.78
35.03	-76.57	June 12, 2011	1117766	111776601	8835440301	SILVER PERCH	2.00	0.10
35.03	-76.57	June 12, 2011	1117766	111776601	8857030304	SOUTHERN FLOUNDER	5.00	0.07
35.03	-76.57	June 12, 2011	1117766	111776601	8851030103	BUTTERFISH	57.00	0.90
35.03	-76.57	June 12, 2011	1117766	111776601	8835440701	ATLANTIC CROAKER	11.00	0.05

Esri

This slide provides an example of ArcGIS Online capabilities. The SEAMAP-SA Catch Data for 2011 is displayed with pop-up features and the accompanying table below.



**SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL... To Conserve and Manage**

southeast bathymetry  
 Deepwater Snapper Grouper MPAs  
 Special Management Zones in the Southeast  
 Deepwater Coral Habitat Areas of Particular Concern  
 Oculina MPA  
 SAFMC Restrictions  
 Danger Zones and Restricted Areas in the Southeast U.S. - 1998

SAFMC Fishery - Catch Data (18,581 features, 13 selected)

Latitude	Longitude	Date	Event	Collection	Species Code	Common Name	Total Number	
35.03	-76.57	June 12, 2011	1117766	111776601	8835440401	SPOT	55.00	
35.03	-76.57	June 12, 2011	1117766	111776601	8835440301	SILVER PERCH	2.00	
35.03	-76.57	June 12, 2011	1117766	111776601	8857030304	SOUTHERN FLOUNDER	5.00	
35.03	-76.57	June 12, 2011	1117766	111776601	8851030103	BUTTERFISH	57.00	0.90
35.03	-76.57	June 12, 2011	1117766	111776601	8835440701	ATLANTIC CROAKER	11.00	0.05

Table Options:   
 Sort Ascending   
 Sort Descending   
 Statistics

Users can analyze the statistics of a field attribute by clicking on the column of interest . In this example we selected “Total Number”

### Statistics

**Field: Total Number**

---

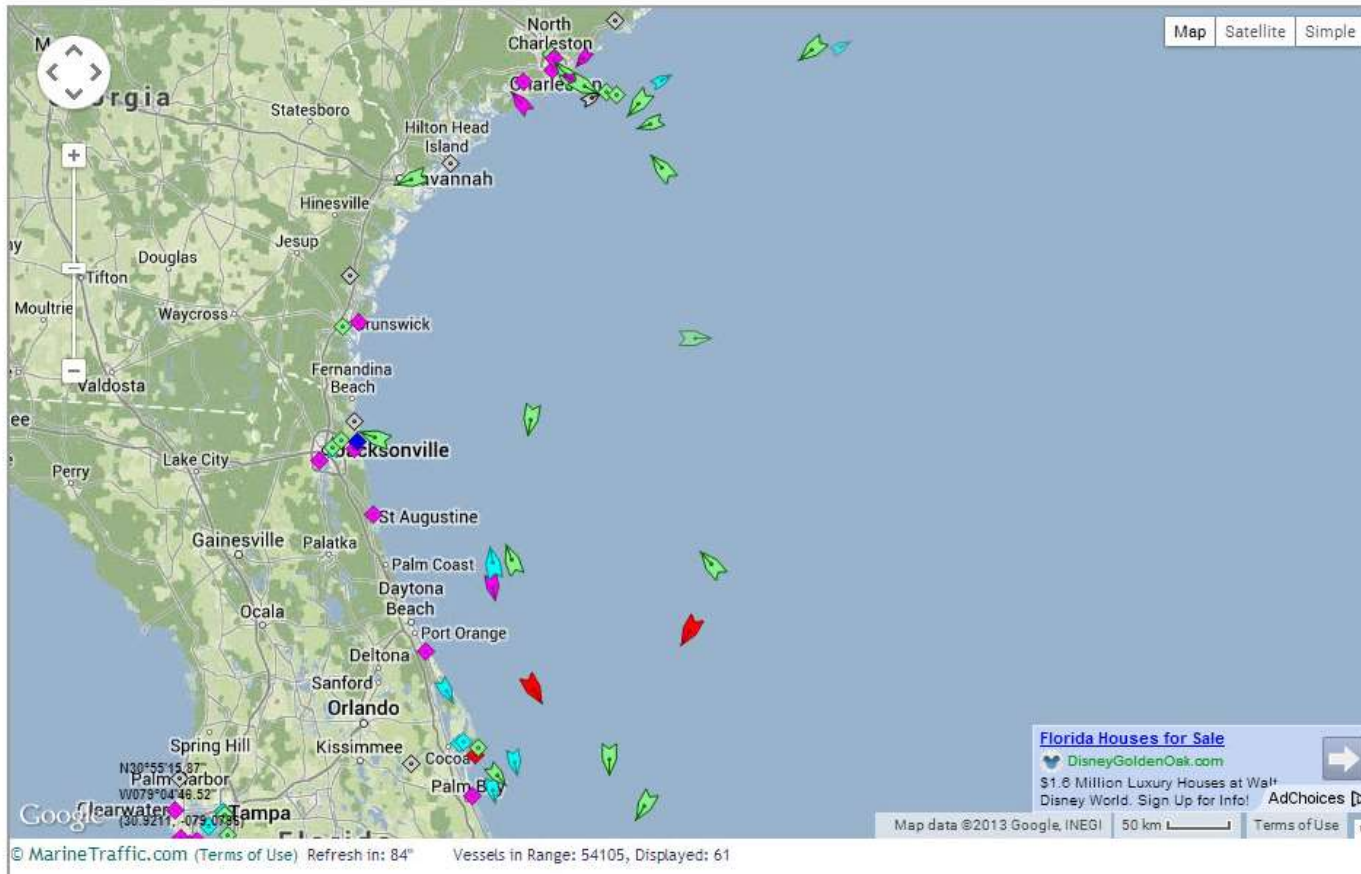
Number of Values	13
Sum of Values	845
Minimum	0
Maximum	575
Average	65
Standard Deviation	155.49

The statistics pop-up window provides a quick overview of how many samples were collected and the total number of fish caught at this station. Minimum, Maximum, and Average values are also provided.



# Marine Traffic

time of arrival, or photographs. Learn more about this service [here](#).



This page 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. Learn more about this service [here](#).



# MPA Story Map

## SAFMC Deepwater Marine Protected Areas

This map was created to share information of the deepwater marine protected areas in the South Atlantic bight region.

A map story



Deep Water Snapper Grouper MPAs

Eight deepwater Marine Protected Areas (MPAs) have been established in the South Atlantic region through implementation of Amendment 14 to the Snapper Grouper Fishery Management Plan. The MPAs are designed to protect a portion of the long lived, deepwater



Snapper Grouper Wreck MPA



Northern South Carolina MPA



Edisto MPA



Charleston Deep Artificial Reef MPA



Georgia MPA



North Florida MPA



St. Lucie Hump MPA



East Hump MPA

The MPA Story map was created to provide users an opportunity to view underwater images collected in the Deepwater Snapper Grouper MPAs. Users can interact with the map or the thumbnails to see the images and descriptive text.

**SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL... To Conserve and Manage**



# SAFMC Partners

The partners page highlights the federal, national, regional and state collaborations of SAFMC.

## SAFMC Digital Dashboard

[Home](#) [GIS Data](#) [Partners](#) [Contact Us](#)

### Partners

#### Federal and National Partners

##### NOAA Fisheries - Habitat Conservation Division

The Habitat Conservation Division (HCD) is responsible for the protection and conservation of coastal habitats important to commercial and recreational fishery resources of the southeastern United States. The HCD focuses efforts on conserving coastal habitats in the eight coastal states from North Carolina to Texas, and Puerto Rico and the U.S. Virgin Islands.

##### National Fish Habitat Partnership

The National Fish Habitat Partnership works to conserve fish habitat nationwide—leveraging federal, state and private funding sources to achieve the greatest impact on fish populations through priority conservation projects. The national partnership implements the National Fish Habitat Action Plan and supports 11 regional grassroots partner organizations.

#### Regional Partners

##### SECOORA - Southeast Coastal Ocean Observing Regional Association

SECOORA is the regional solution to integrating coastal and ocean observing data in the Southeast United States to inform decision makers and the general public. The SECOORA region encompasses 4 states, over 43 million people and spans the coastal ocean from North Carolina to the west Coast of Florida.

##### Governor's South Atlantic Alliance

The GSAA is working to increase regional collaboration among South Atlantic states with federal agency partners and other stakeholders to sustain and enhance the environmental (coastal/marine), natural resource, economic, public safety, social, and national defense missions of the respective states and the South Atlantic region.

##### SALCC

The South Atlantic Landscape Conservation Cooperative (SALCC) is part of a national network of Landscape Conservation Cooperatives (LCCs). LCCs are applied conservation science partnerships among federal agencies, regional organizations, states, tribes, NGOs, universities and other entities within a geographic area. They are designed to inform resource management decisions as an integrated fashion.

##### Southeast Aquatic Resources Partnership

The Southeast Aquatic Resources Partnership (SARP) is a regional collaboration of natural resource and science agencies, conservation organizations and private interests developed to strengthen the management and conservation of aquatic resources in the southeastern United States.

#### State Partners

##### NCDENR - North Carolina Division of Marine Fisheries

The Division of Marine Fisheries is dedicated to ensuring sustainable marine and estuarine fisheries and habitats for the benefit and health of the people of North Carolina.

##### SCDNR - Marine Resources Research Institute

The Marine Resources Research Institute (MRI) provides the scientific expertise and facilities to support the Marine Division's resource management and educational programs. MRI scientists work closely with the Office of Fisheries Management (OFM) to conduct research and monitoring programs to assess the condition of our coastal resources and provide data required to address policy and management issues related to those resources.

##### GDNR - Division of Coastal Resources

The Coastal Resources Division is the state agency entrusted to manage Georgia's coastal marshes, beaches, waters, and marine fisheries resources for the benefit of present and future generations. The Division's service area extends from the inland reach of the tidal waters to three miles offshore.

##### FWC - Fish and Wildlife Research Institute

The Fish and Wildlife Research Institute's work includes assessment and restoration of ecosystems and studies of freshwater and marine fisheries, aquatic and terrestrial wildlife, imperiled species, and red tides. The Institute develops the information science required to analyze and disseminate research products and engages in outreach activities to complement all programs.

#### Links

[South Atlantic Fishery Management Council](#)  
[Fish and Wildlife Research Institute](#)  
[Marine State Marine Fishery Commission](#)  
[Southeast Regional Fisheries Science](#)

#### Connect With Us

The South Atlantic Fishery Management Council is here to help you.



#### Subscribe

Subscribe to our newsletter to get the latest news.





# Contact Us

The screenshot shows the 'Contact Us' page of the SAFMC Digital Dashboard. At the top, there is a navigation bar with 'Home', 'GIS Data', 'Partners', and 'Contact Us' (the active page). Below the navigation bar, the text 'Please send us a message!' is displayed. The main content area is split into two columns. The left column features a satellite map of the Charleston, SC area, with a red pin marking the SAFMC office location. The right column contains contact information for the SAFMC Office, including the address (4055 Faber Place Drive, Suite 201, North Charleston, SC 29405), phone number ((843) 571-4366), and two staff members: Roger Pugliese (Senior Fishery Biologist) and Tina Udouj (FWC-FWS GIS Specialist). Below the map, there is a 'View Larger Map' link. At the bottom of the page, there is a dark grey footer with three sections: 'Links' (listing South Atlantic Fishery Management Council, Fish and Wildlife Research Institute, North State Marine Fisheries Commission, and Southeast Regional Fisheries Center), 'Connect With Us' (with Facebook and Twitter icons), and 'Subscribe' (with an email icon and a text prompt to subscribe to newsletters).

This page provides users an opportunity to provide feedback on the dashboard and its content.



Let's Explore

# SAFMC HABITAT AND ECOSYSTEM VIEWER





### Welcome to the SAFMC Atlas

This application was developed for the South Atlantic Fishery Management Council (SAFMC) with ArcGIS Viewer for Flex. It 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 fishery independent data collected by the SEAMAP - South Atlantic (SA) component and by the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) program.

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](#)

Click to continue

Oceans Imagery Streets

2751

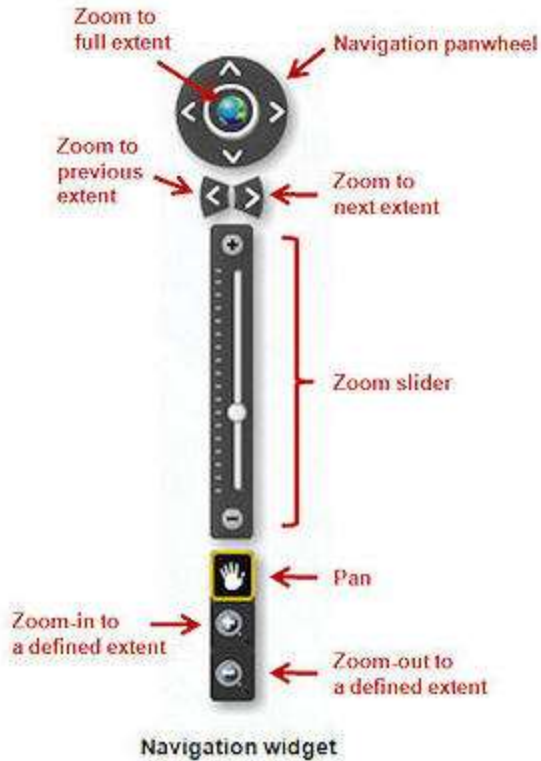
LayerList

Layer Visibility

- Managed Areas
- Fisheries
- EFH
- Habitats
- Multibeam and Bathymetry Charts
- Nautical Charts
- South Carolina Energy
- Estuarine Bathymetry



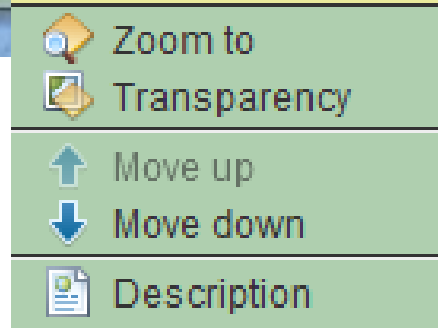
# The Basics

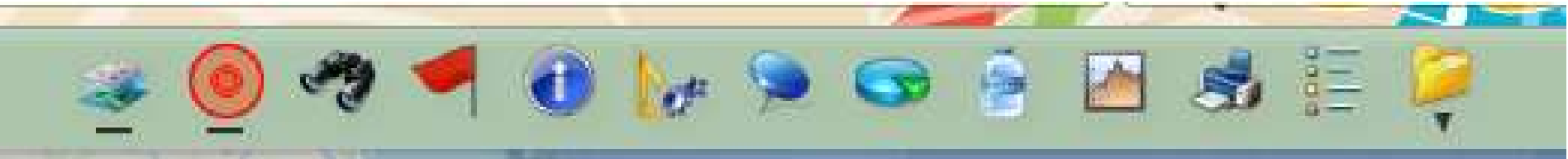


## Navigation



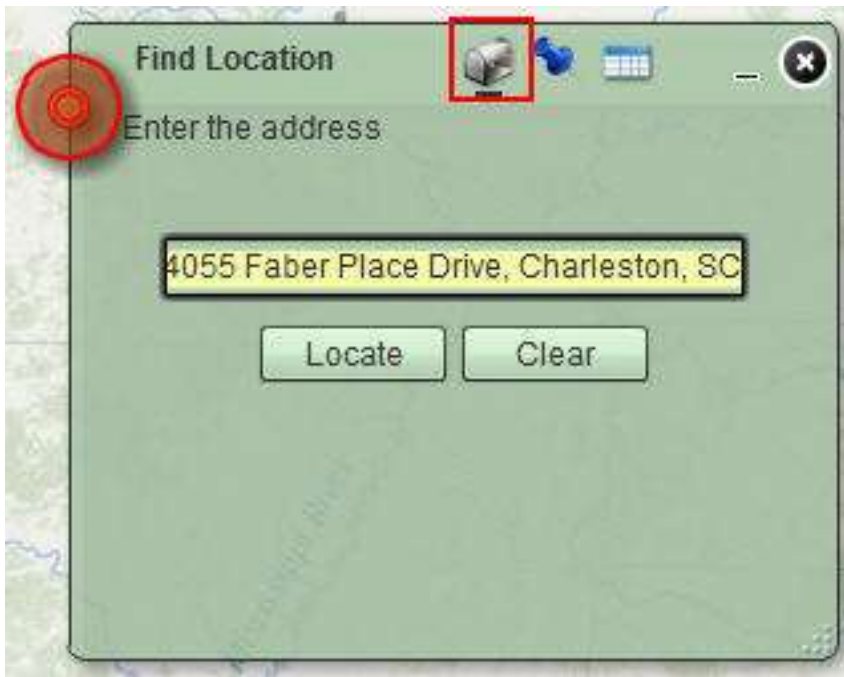
## Display





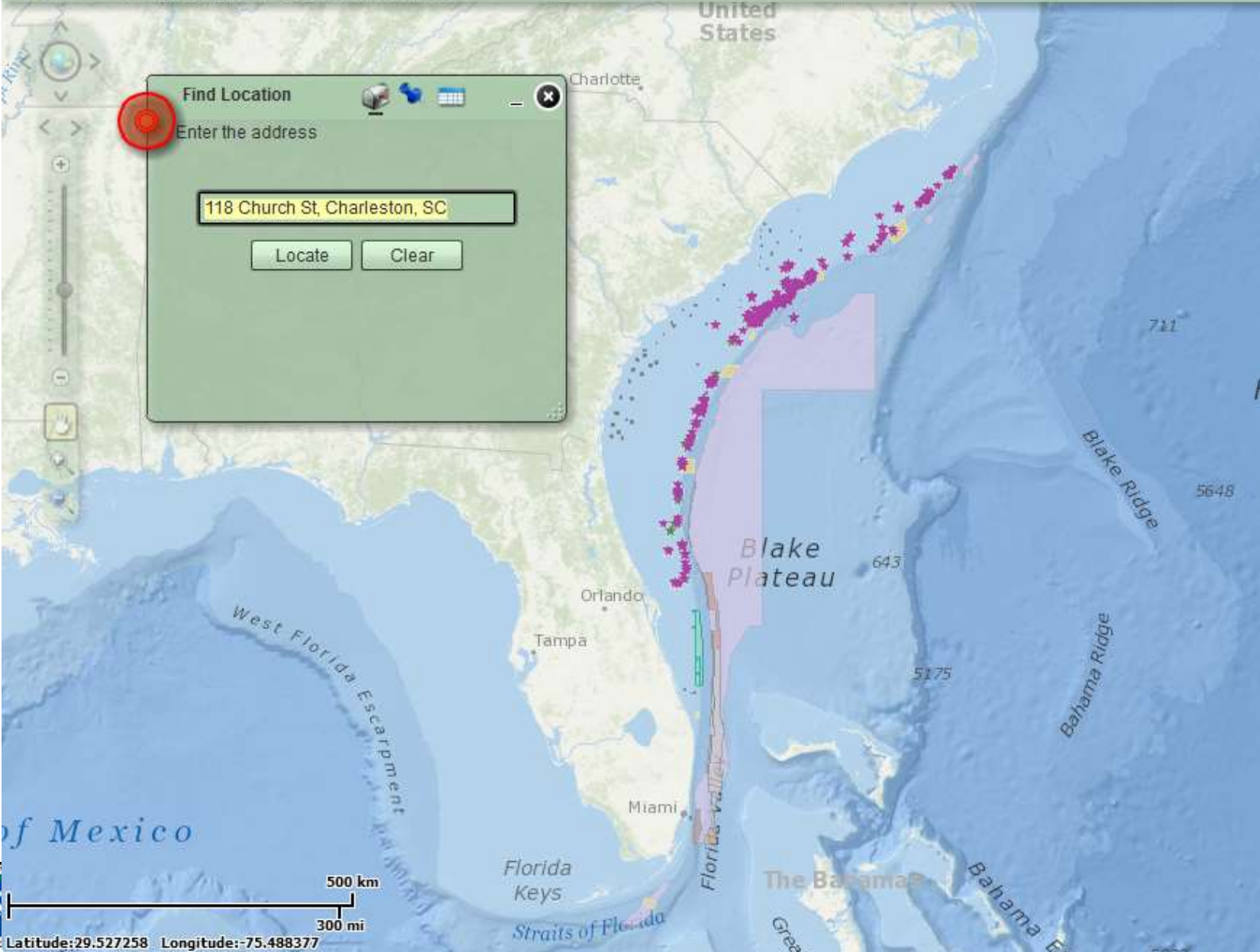
# Find Locations

- Enter an address
- Click locate
- Map zooms to that location
- If there are multiple results, choose the one with the highest score



# SAFMC Habitat and Ecosystem Viewer

Integrating Management Resources



**Find Location**

Enter the address

118 Church St, Charleston, SC

Locate Clear





**Find Location**

Locations found: 2

- 118 Church St, Charleston, SC, 29401  
Score: 100
- 119 Church St, Charleston, SC, 29401  
Score: 79

**118 Church St, Charleston, SC, 29401**

Score: 100

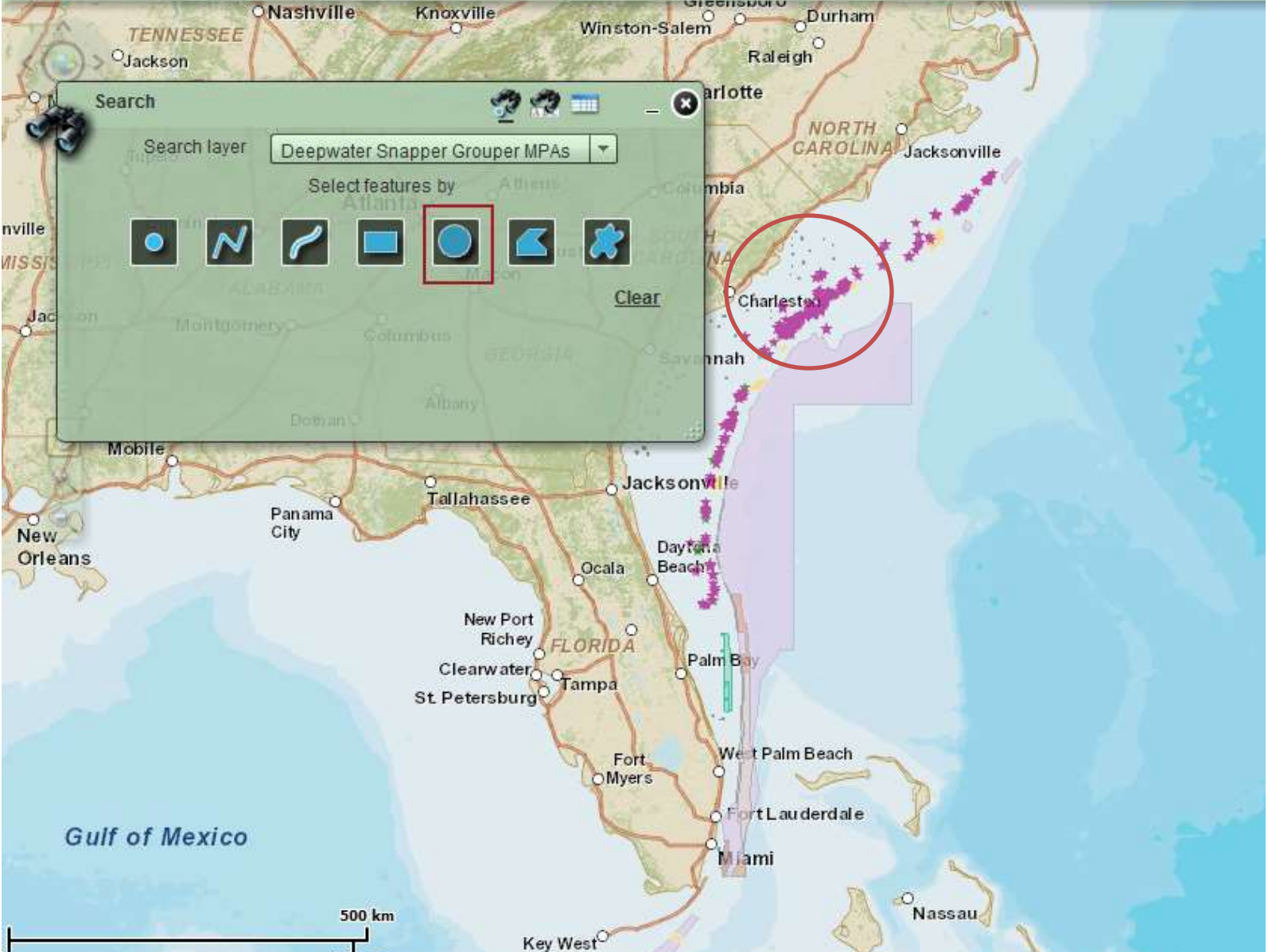
Zoom to



# Search using graphics

- Select layer
  - Marine protected areas
  - Special management zones
  - Deepwater snapper grouper MPAs
- Select features of that layer by drawing a rectangle (or circle, polygon, etc) in an area of interest

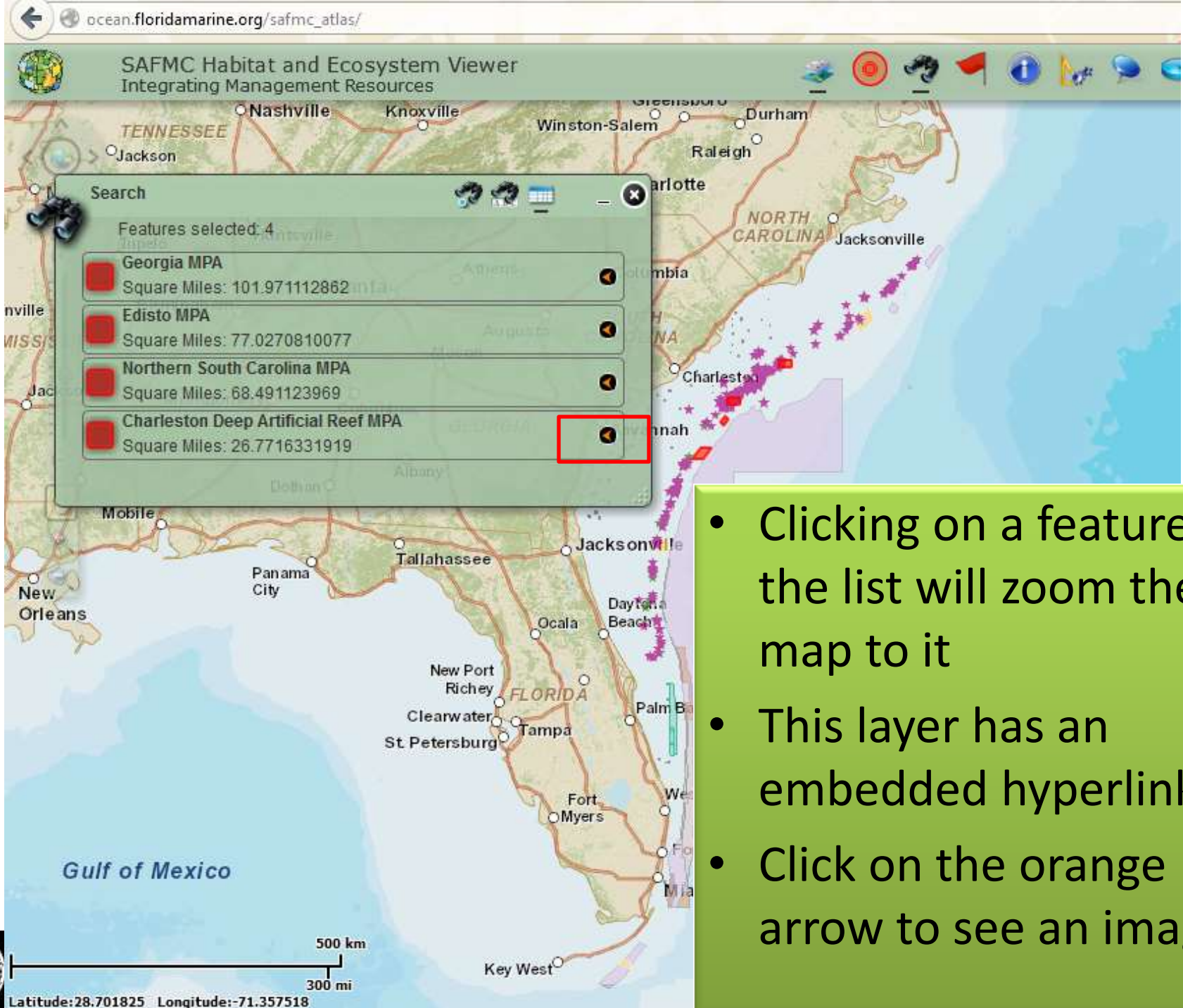




Latitude: 29.297572 Longitude: -74.148045



S0







Danger Zones or Restricted Areas

Search by Unit Type [ Example: Danger% or Restricted%]

Danger%

Search

Clear

- Search using attributes
- Enter “Danger%” or “Restricted%”
- The % sign functions as a wild card for this search widget.
- Click search

Gulf of Mexico

500 km

300 mi

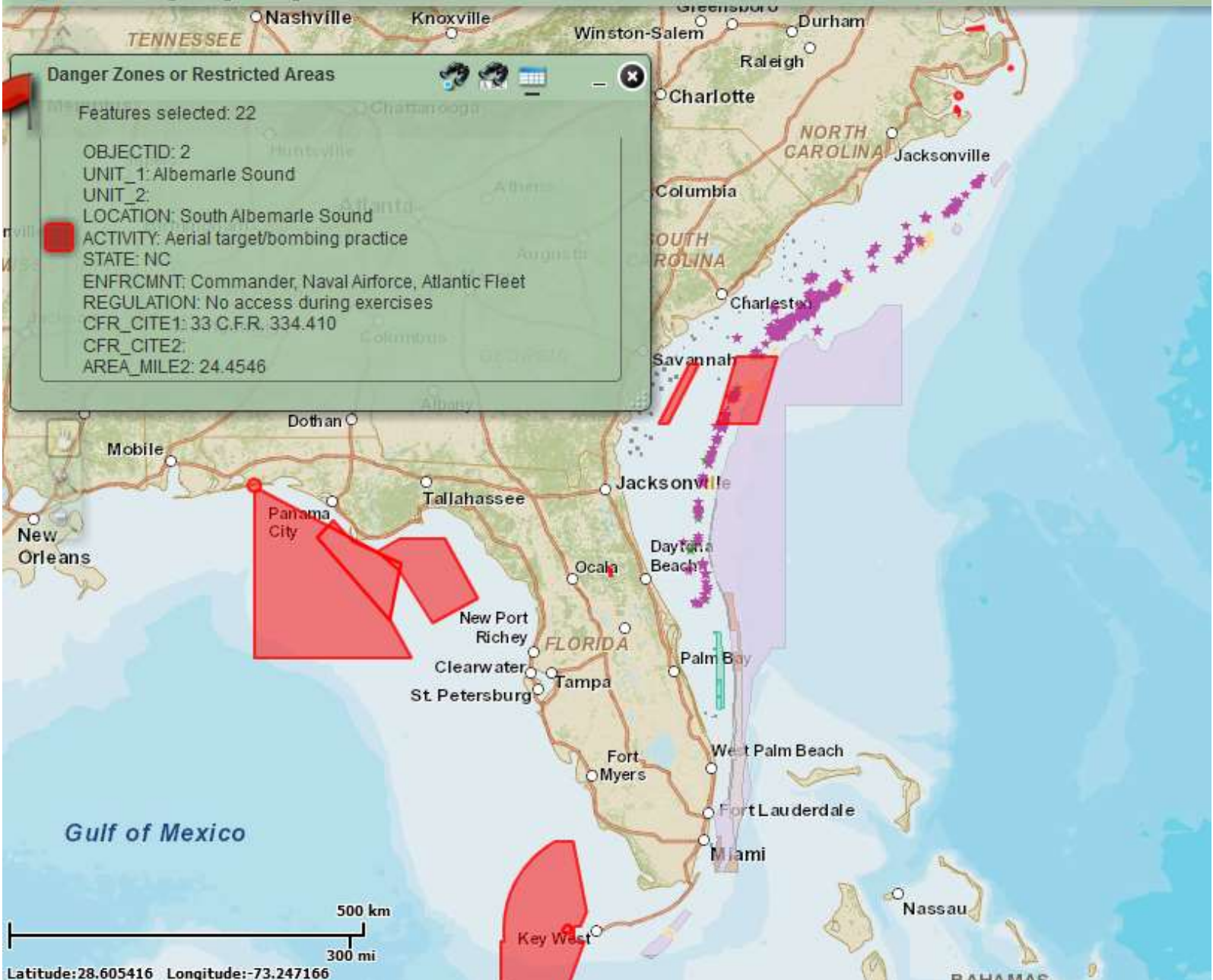
Latitude:29.622807 Longitude:-74.609471

BAHAMAS



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**Danger Zones or Restricted Areas**

Features selected: 22

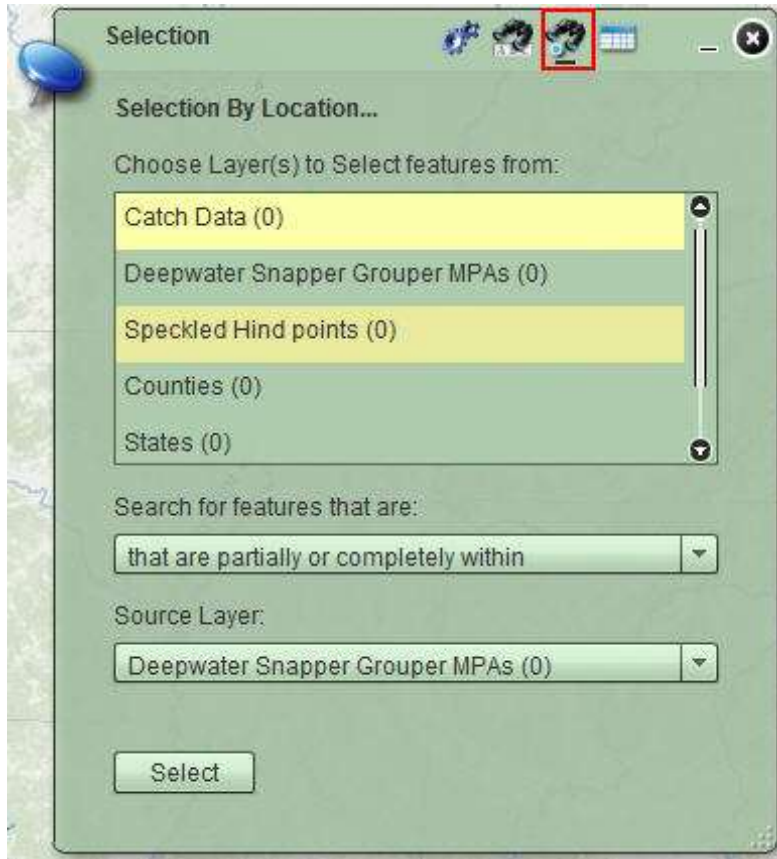
OBJECTID: 2  
UNIT\_1: Albemarle Sound  
UNIT\_2:  
LOCATION: South Albemarle Sound  
ACTIVITY: Aerial target/bombing practice  
STATE: NC  
ENFRMNT: Commander, Naval Airforce, Atlantic Fleet  
REGULATION: No access during exercises  
CFR\_CITE1: 33 C.F.R. 334.410  
CFR\_CITE2:  
AREA\_MILE2: 24.4546



500 km  
300 mi  
S Latitude: 28.605416 Longitude: -73.247166

BAHAMAS

# Select Features



- select features based on their location
- Choose layer to select features from
  - **Speckled hind points**
- Search for features that are partially or completely within
  - **Deepwater snapper grouper MPAs**
- Click Select





# SAFMC Habitat and Ecosystem Viewer

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**Selection**

Selection By Location...

Choose Layer(s) to Select features from:

- Catch Data (0)
- Speckled Hind points (0)**
- Deepwater Snapper Grouper MPAs (0)
- States (0)
- Counties (0)

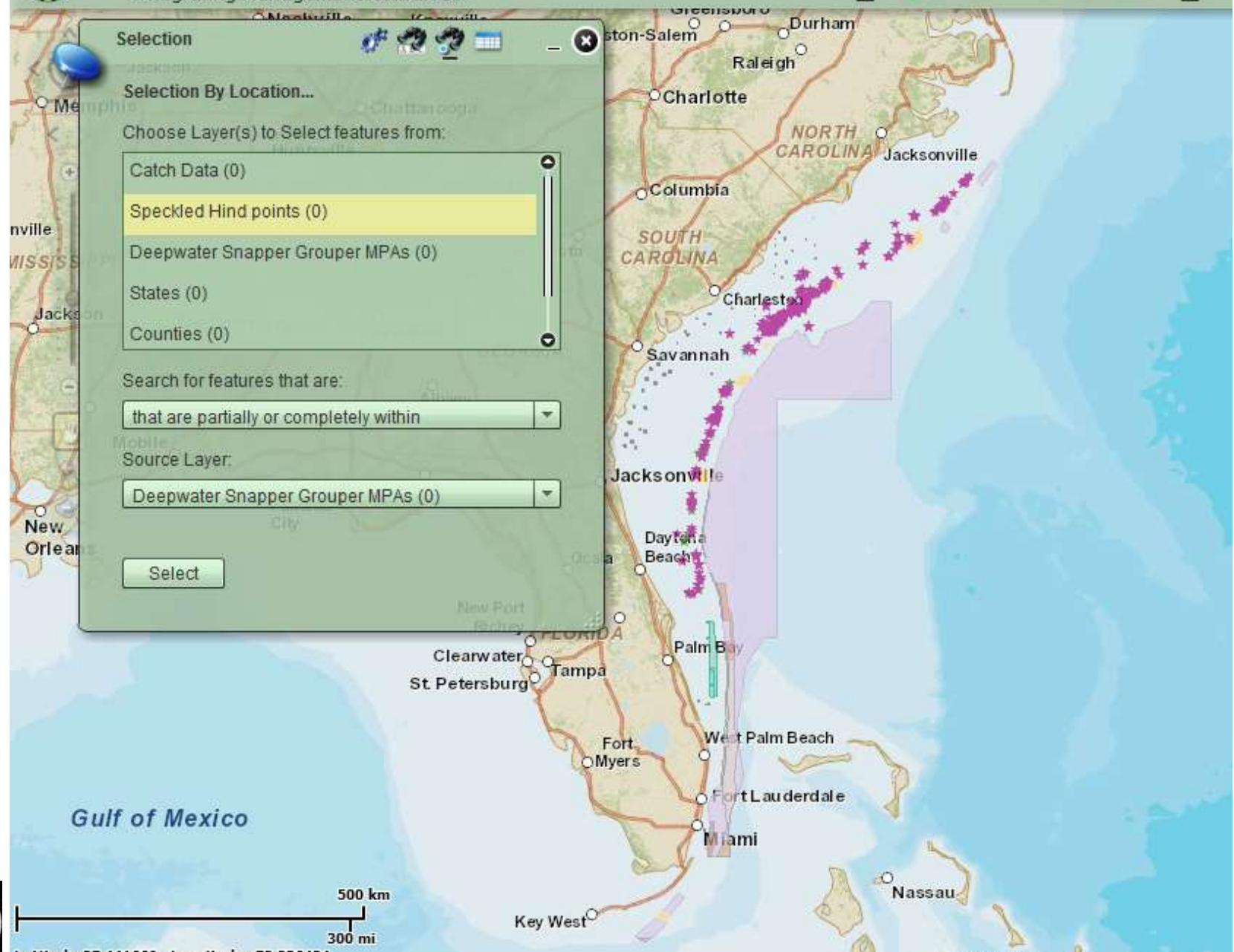
Search for features that are:

that are partially or completely within

Source Layer:

Deepwater Snapper Grouper MPAs (0)

Select







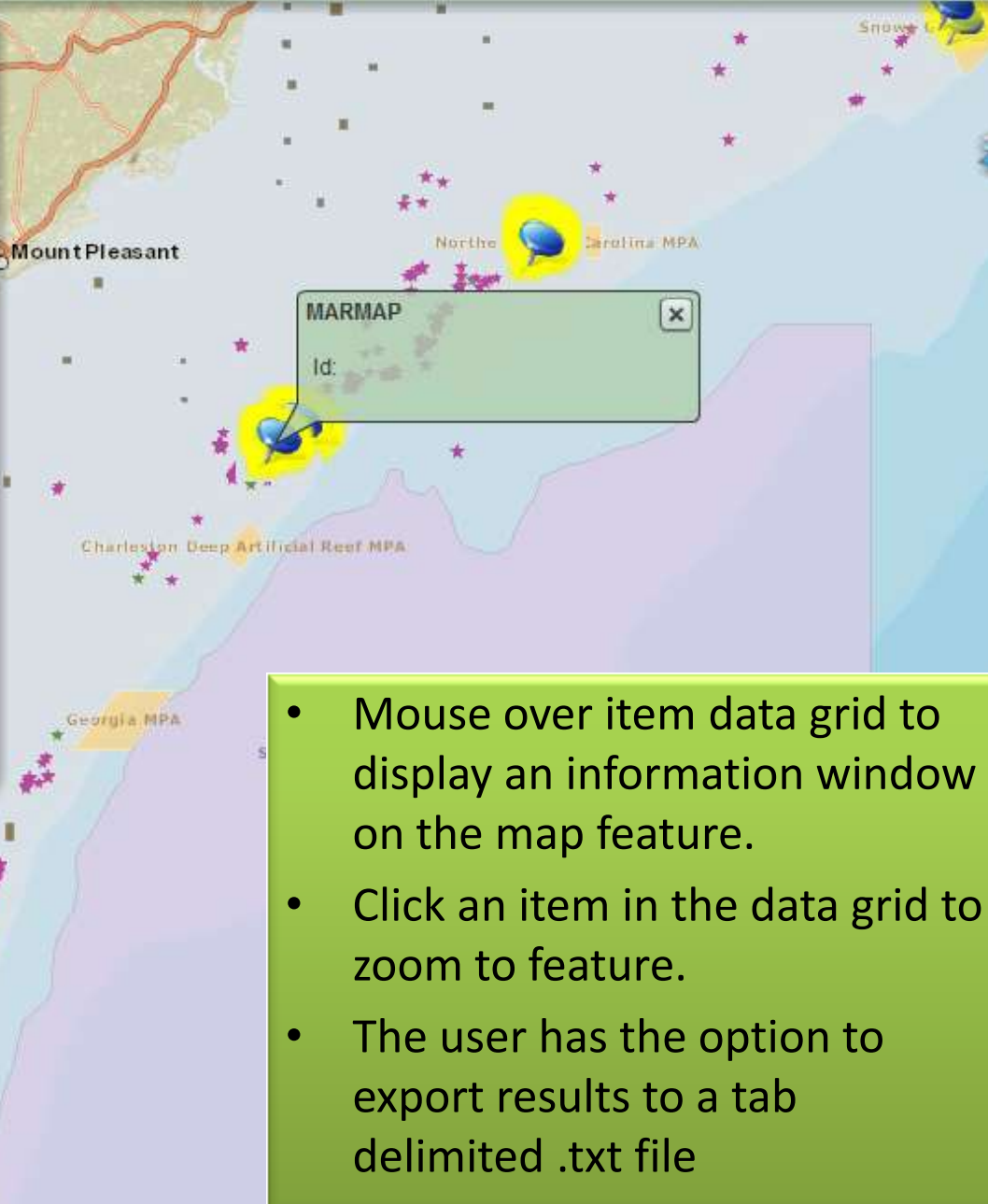
**Selection**

Selection Results...

Speckled Hind points (85)

Id	Source
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP
0	MARMAP

Clear    Zoom    Export



**MARMAP**

Id:

- Mouse over item data grid to display an information window on the map feature.
- Click an item in the data grid to zoom to feature.
- The user has the option to export results to a tab delimited .txt file

# Tips when using ArcGIS Viewer for Flex

- The more you utilize the map data viewer, the refresh and drawing time will decrease. Your computer's web browser will cache some of the data so next time you draw that area it should perform quicker.
- Zoom into an area of interest before you check the data layers for display.
- Only choose 4 or 5 data layers to display at any one time. Displaying all the layers at once will tend to slow down the refresh time.
- Pressing F5 will zoom to the original extent as when initially opened and refresh all the layers.



# links

- [SAFMC Dashboard](#)
- [SAFMC Fisheries](#)
- [SAFMC EFH](#)
- [SAFMC Managed Areas](#)
- [SAFMC Atlas](#)



# EcoSpecies Supports

- Mandated five year Essential Fish Habitat (EFH) reviews for SAFMC managed species
- SAFMC Habitat Management
- South East Data, Assessment, and Reviews (SEDAR)
- Fisheries Ecosystem Plan(FEP)
- Assist managers in making decisions permitting for habitat alterations etc.
- General Public
- Fishermen



# Resources

- Florida Estuarine Living Marine Resources (FLELMR) Decision Support System
  - Master bibliography
  - Species Life Histories (SLHs) and data tables
    - 90 species of marine fish and invertebrates
  - Developed and maintained since 1990 in Hypercard and as discrete text documents
  - Work product of professional biologists

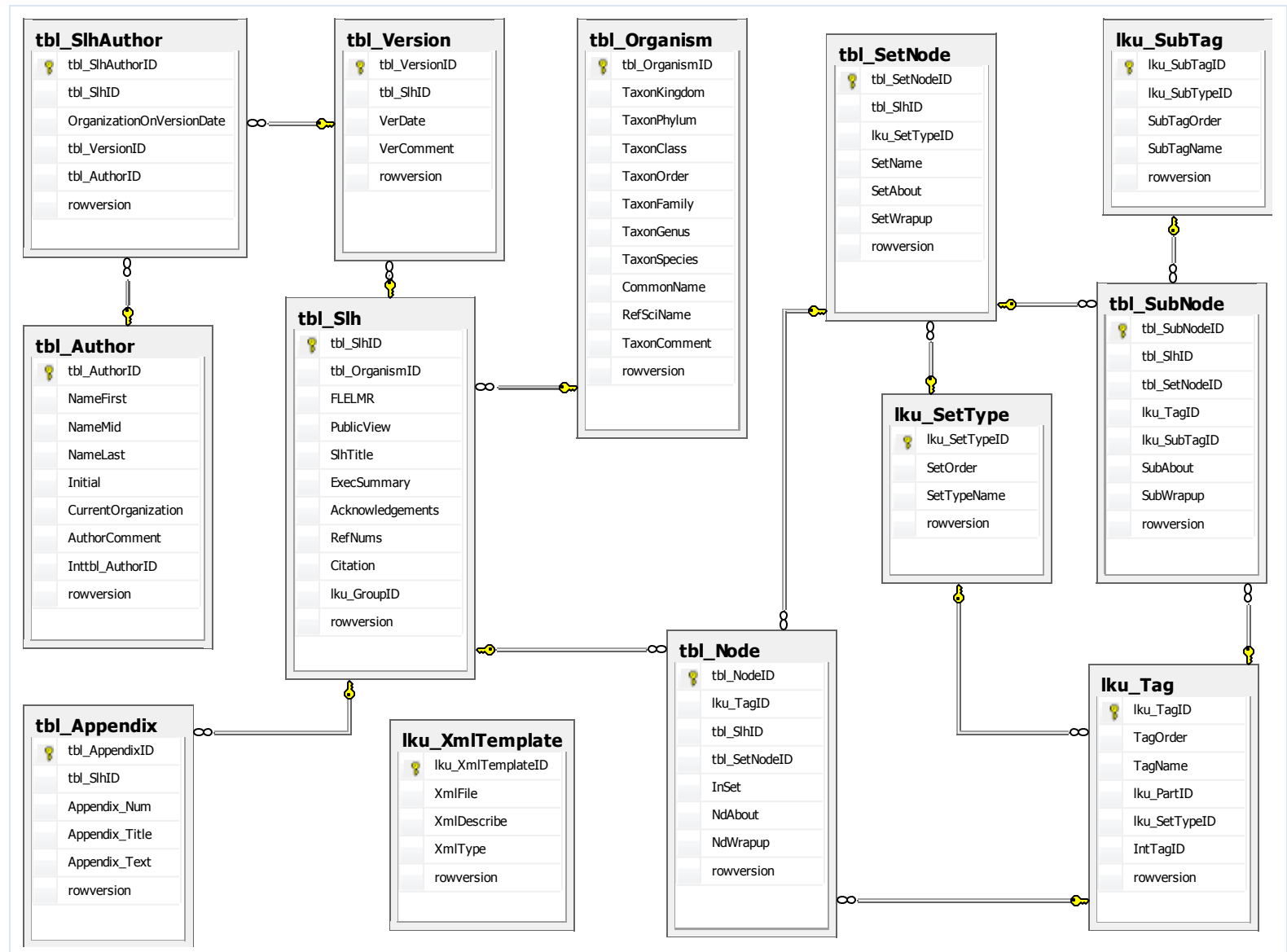


# First Year of EcoSpecies Project

- Database design & implementation
- Species Life History Formal Outline
- Species Life History Updates
- Text document ingestion into database
- Web application



# EcoSpecies Database Diagram



# Species Life History Updates

- **Updated for content**
  - Some of the 90 SLH documents
- **Minor format changes**
  - Most documents were formatted to make them suitable for ingestion
- 90 SLHs are in the database.





# Text Document Ingestion

- A Python script parses SLH documents
  - Reads text of document
  - Identifies tags that specify elements of documents
    - Maps common misspellings, variant spellings to consistent nomenclature
  - Emits T-SQL code for database updates
- Collected T-SQL representation of SLH documents can be brought into database in batch



# Web Application

- Cutting-edge web development
  - C# ASP.NET MVC3 application development
  - Razor user interface
- Connects to SQL Server database
- Presents list of species by taxonomy
- Prepares SLH report in RTF, text, and HTML formats conforming to outline
- XML used to specify format of reports



<http://ecospecies.azurewebsites.net/>

The Web Application is now in the  
cloud.

(For best viewing, open in Firefox or Chrome)





# South Atlantic Fishery Management Council

conserving and managing America's fisheries from three to 200 miles  
off the coasts of North Carolina, South Carolina, Georgia and East Florida



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## EcoSpecies: Home

### Welcome to EcoSpecies

The intended audience for this site includes Fishermen, Scientists, Fisheries Managers, Coastal Zone Managers, Consultants, Public Outreach, and Media.

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), which was reauthorized and amended by the Sustainable Fisheries Act passed by the U.S. Congress in 1996, requires the eight regional fishery management councils to describe and identify essential fish habitat (EFH) in their respective regions, to specify actions to conserve and enhance that EFH, and to minimize the adverse effects of fishing on EFH. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."

NOAA Fisheries has taken a broad view of habitat as the areas used by fish throughout their life cycle. Fish use habitat for spawning, feeding, nursery, migration, and shelter, but most habitats provide only a subset of these functions. Fish may change habitats with changes in life history stage, seasonal and geographic distributions, abundance, and interactions with other species. The type of habitat, as well as its attributes and functions, are important for sustaining the production of managed species.

NOAA Fisheries provided guidance to the regional fishery management councils for identifying and describing EFH of their managed species. Consistent with this guidance, the species reports require information on current and historic stock sizes, geographic range, and the period and location of major life history stages. The habitats of managed species should be described by the physical, chemical, and biological components of the ecosystem where the species occur. Information on the habitat requirements for each species are required for each life history stage, and include, where available, habitat and environmental variables that control or limit distribution, abundance, growth, reproduction, mortality, and productivity. Updating and review of the EFH components of the councils' Fishery Management Plans is required at least every 5 years by the NOAA Fisheries Guidelines for meeting the Sustainable Fisheries Act/EFH Final Rule.

The South Atlantic Fisheries Management Council (SAFMC) has compiled available information on the distribution, abundance, and habitat requirements for many of the species managed by the Council (SAFMC 1998). Further information about benthic habitats and species important for the recreational and commercial fisheries were compiled in the Fisheries Ecosystem Plan (FEP) created for the South Atlantic Region (SAFMC FEP2009). Information about the various fisheries in the Region are also summarized.





# South Atlantic Fishery Management Council

conserving and managing America's fisheries from three to 200 miles off the coasts of North Carolina, South Carolina, Georgia and East Florida

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## EcoSpecies: Species List

Common\_Name ▾ 

Note: use the column headings to sort the rows; then search to have the search results in order

Report	Common Name	Phylum	Class	Order	Family	Genus	Species	ID
<a href="#">Report</a>	Daggerblade Grass Shrimp	Arthropoda	Malacostraca	Decapoda	Palaemonidae	Palaemonetes	pugio	96390
<a href="#">Report</a>	Spiny Lobster	Arthropoda	Malacostraca	Decapoda	Palinuridae	Panulirus	argus	97648
<a href="#">Report</a>	Brown Shrimp	Arthropoda	Malacostraca	Decapoda	Penaeidae	Farfantepenaeus	aztecus	551570
<a href="#">Report</a>	Pink Shrimp	Arthropoda	Malacostraca	Decapoda	Penaeidae	Farfantepenaeus	duoraum	551574
<a href="#">Report</a>	White Shrimp	Arthropoda	Malacostraca	Decapoda	Penaeidae	Penaeus	setiferus	551680
<a href="#">Report</a>	Blue Crab	Arthropoda	Malacostraca	Decapoda	Portunidae	Callinectes	sapidus	98696
<a href="#">Report</a>	Gulf Stone Crab	Arthropoda	Malacostraca	Decapoda	Xanthidae	Menippe	adina	98812
<a href="#">Report</a>	Stone Crab	Arthropoda	Malacostraca	Decapoda	Xanthidae	Menippe	mercenaria	98811
<a href="#">Report</a>	Red Snapper	Chordata	Actinopterygii	Perciformes	Lutjanidae	Lutjanus	campechanus	168853
<a href="#">Report</a>	Gulf Pipefish	Chordata	Actinopterygii	Gasterosteiformes	Syngnathidae	Syngnathus	scovelli	166458
<a href="#">Report</a>	Striped Mojarra	Chordata	Actinopterygii	Perciformes	Gerreidae	Eugerres	plumieri	169028
<a href="#">Report</a>	Darter Goby	Chordata	Actinopterygii	Perciformes	Gobiidae	Ctenogobius	boleosoma	171768
<a href="#">Report</a>	Naked Goby	Chordata	Actinopterygii	Perciformes	Gobiidae	Gobiosoma	bosci	171789
<a href="#">Report</a>	Spotted Seatrout	Chordata	Actinopterygii	Perciformes	Sciaenidae	Cynoscion	nebulosus	169239
<a href="#">Report</a>	Pinfish	Chordata	Actinopterygii	Perciformes	Sparidae	Lagodon	rhomboides	169187
<a href="#">Report</a>	Bull Shark	Chordata	Chondrichthyes	Elasmobranchii	Carcharhinidae	Carcharhinus	leucas	160275
<a href="#">Report</a>	Blacktip Shark	Chordata	Elasmobranchiomorphi	Lamniformes	Carcharhinidae	Carcharhinus	limbatus	160318
<a href="#">Report</a>	Bonnethead Shark	Chordata	Elasmobranchiomorphi	Lamniformes	Sphyrnidae	Sphyrna	tiburo	160502
<a href="#">Report</a>	Lemon Shark	Chordata	Elasmobranchiomorphi	Lamniformes	Carcharhinidae	Negaprion	brevirostris	160433
<a href="#">Report</a>	Sheepshead Minnow	Chordata	Osteichthyes	Atheriniformes	Cyprinodontidae	Cyprinodon	variegatus	165631



# Ecosystem Tools - Links

- [SAFMC Dashboard](http://ocean.floridamarine.org/safmc_dashboard/)

[http://ocean.floridamarine.org/safmc\\_dashboard/](http://ocean.floridamarine.org/safmc_dashboard/)

- [SAFMC Fisheries](http://ocean.floridamarine.org/SA_Fisheries/)

[http://ocean.floridamarine.org/SA\\_Fisheries/](http://ocean.floridamarine.org/SA_Fisheries/)

- [SAFMC EFH](http://ocean.floridamarine.org/sa_efh/)

[http://ocean.floridamarine.org/sa\\_efh/](http://ocean.floridamarine.org/sa_efh/)

- [SAFMC Managed Areas](http://ocean.floridamarine.org/safmc_managedareas/)

[http://ocean.floridamarine.org/safmc\\_managedareas/](http://ocean.floridamarine.org/safmc_managedareas/)

- [SAFMC Atlas](http://ocean.floridamarine.org/safmc_atlas/)

[http://ocean.floridamarine.org/safmc\\_atlas/](http://ocean.floridamarine.org/safmc_atlas/)

