

# Coral Reef Conservation Program Grant Update

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Coral SSC, AP Joint Meeting

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# What does the most recent grant include?

- A three year project (2017-2020) addressing threats to **Endangered Corals** from **Climate Change** and **Fishing** to Coral Reef Ecosystems and Associated Fisheries in the Gulf of Mexico using:
  - Spatial Decision-Support Tools
  - Broad Stakeholder Engagement
  - Comprehensive Scientific Review

# Focus on ESA Coral Species

- In September 2014, NOAA Fisheries published a federal register notice that listed seven coral species as threatened under the Endangered Species Act
- Several learning modules and tools were developed as outreach materials in this grant to increase awareness about them

# Task 1: ESA Corals


Assessing our understanding and importance of the 2014 listing of threatened coral, their abundance, and distribution in the Gulf of Mexico.

- Identify baseline abundance and distribution of ESA coral species in the gulf region.
- Generate learning modules from extensive literature search to highlight current distribution, life history information, and potential threats to coral distributions in the Gulf.
- Create metadata and maintain Coral Portal (Portal) with up to date information.



# Outreach Materials

Learning module on life history and Climate Change Impacts to ESA-listed corals. This module can be accessed online at <https://portal.gulfcouncil.org/esagmxcoralhi/>



## Life History and Climate Change Impact to ESA-listed Corals


In September 2014, NOAA Fisheries published a federal register notice that listed seven coral species as threatened under the Endangered Species Act. Understanding life history and the effects of climate change on these species is crucial to protect them.

The seven listed species include:

- Elkhorn coral (*Acropora palmata*)
- Staghorn coral (*Acropora cervicornis*)
- Pillar coral (*Dendrogyra cylindrus*)
- Rough cactus coral (*Mycetophyllia ferox*)
- Lobed star coral (*Orbicella annularis*)
- Mountainous star coral (*Orbicella faveolata*)
- Boulder star coral (*Orbicella franksi*)

This story board explores what life history means and why it's important, how life history and climate change are linked, how climate change is impacting these ESA-listed corals, and what (if anything) can be done to mitigate the impacts of climate change on these species.

Photo (right): Pillar coral. Image courtesy of NOAA Fisheries.



# Outreach Materials

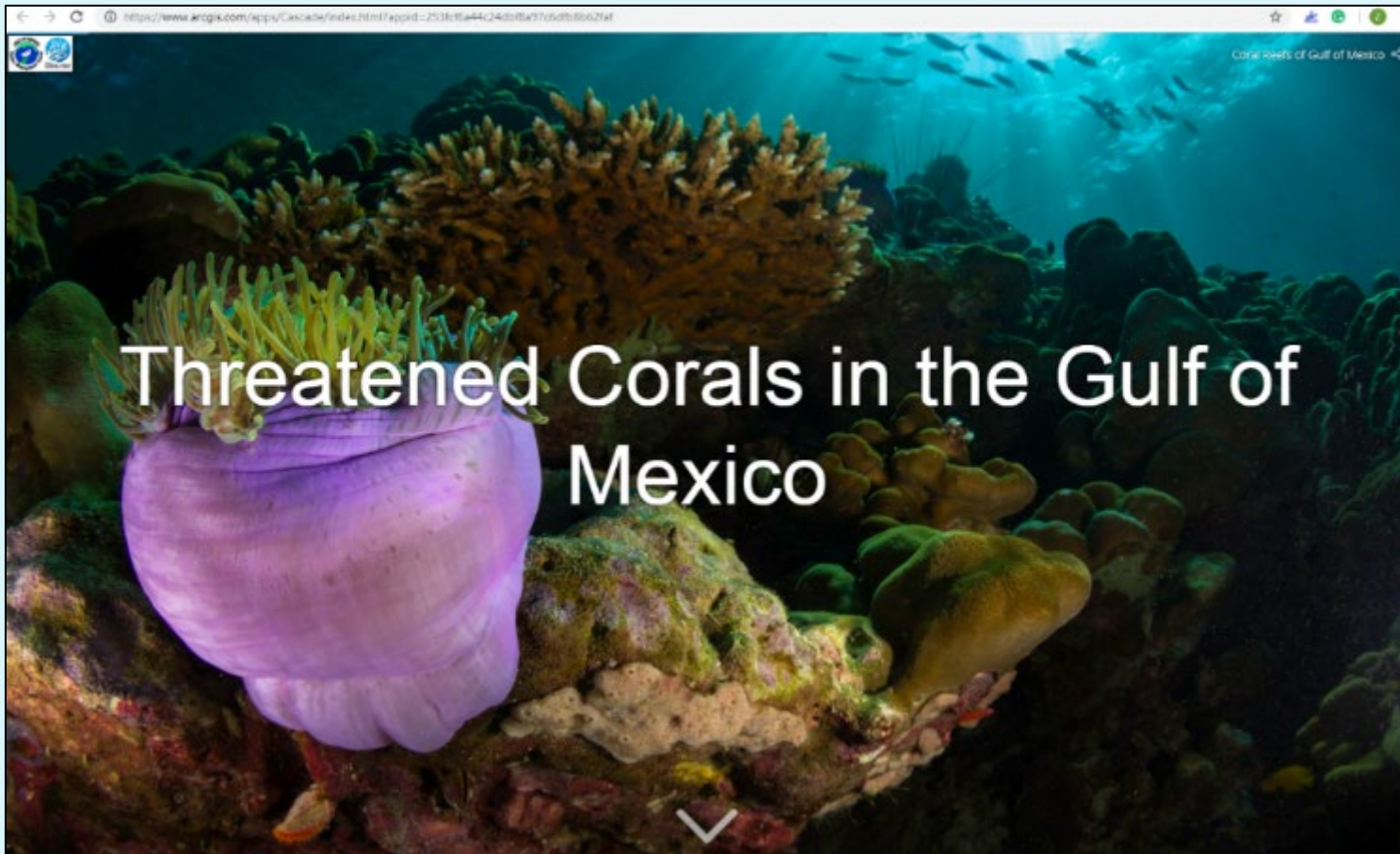
Learning module on causes and consequence of coral reef decline. The module can be accessed online at <https://portal.gulfcouncil.org/CoralDecline.html>





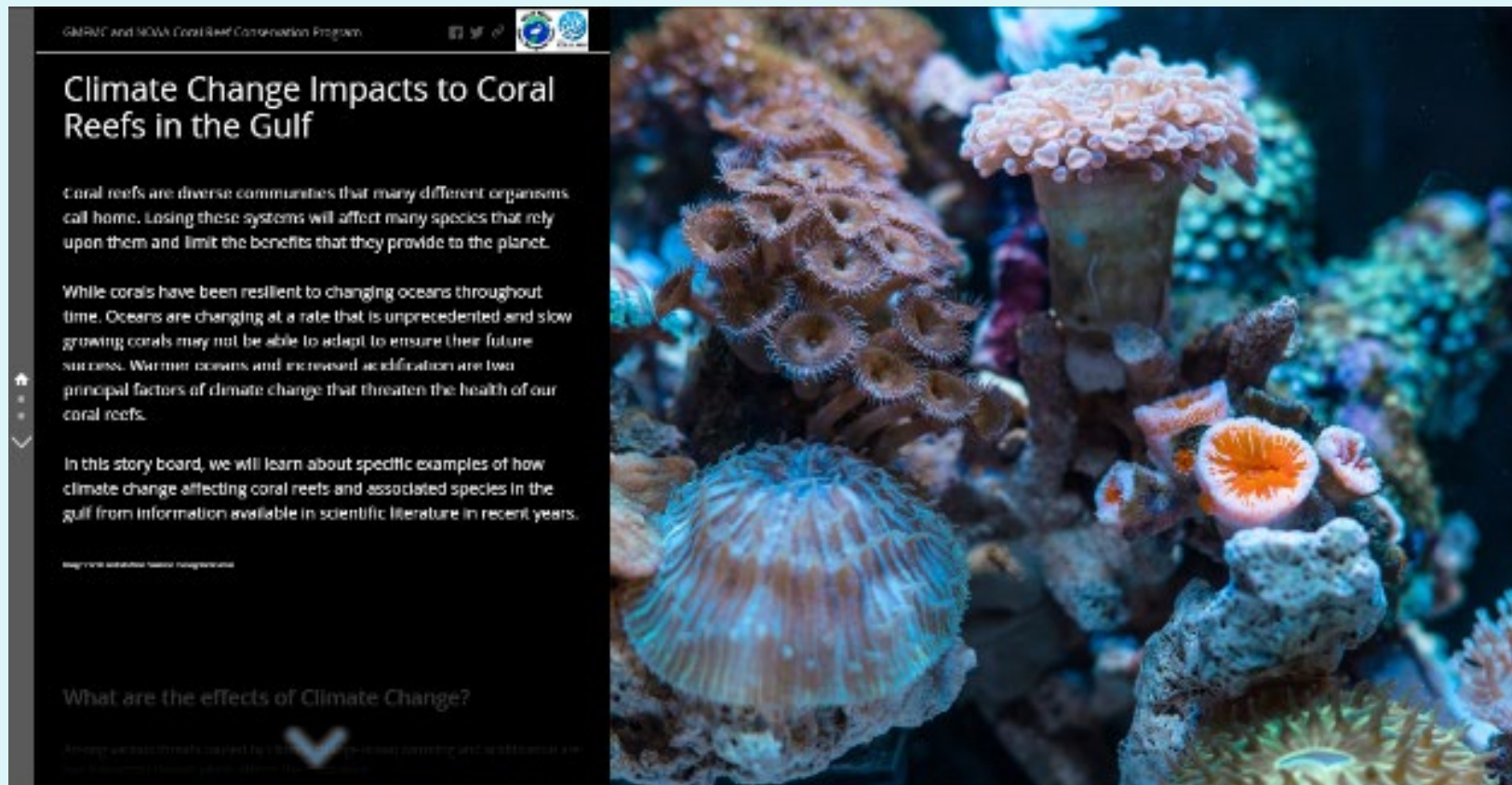
# Outreach Materials

Learning module highlighting the life history and threats specific to endangered species act (ESA) listed individual shallow-water coral species in the Gulf of Mexico. It can be accessed online at <https://portal.gulfcouncil.org/esagmxcoralth/>



# Outreach Materials

Learning modules highlighting the climate change impacts on the Gulf of Mexico corals and effects on coral reef associated species were also developed. Both of them can be accessed at <https://portal.gulfcouncil.org/coralccthreats/> and <https://portal.gulfcouncil.org/ccaspecies/>





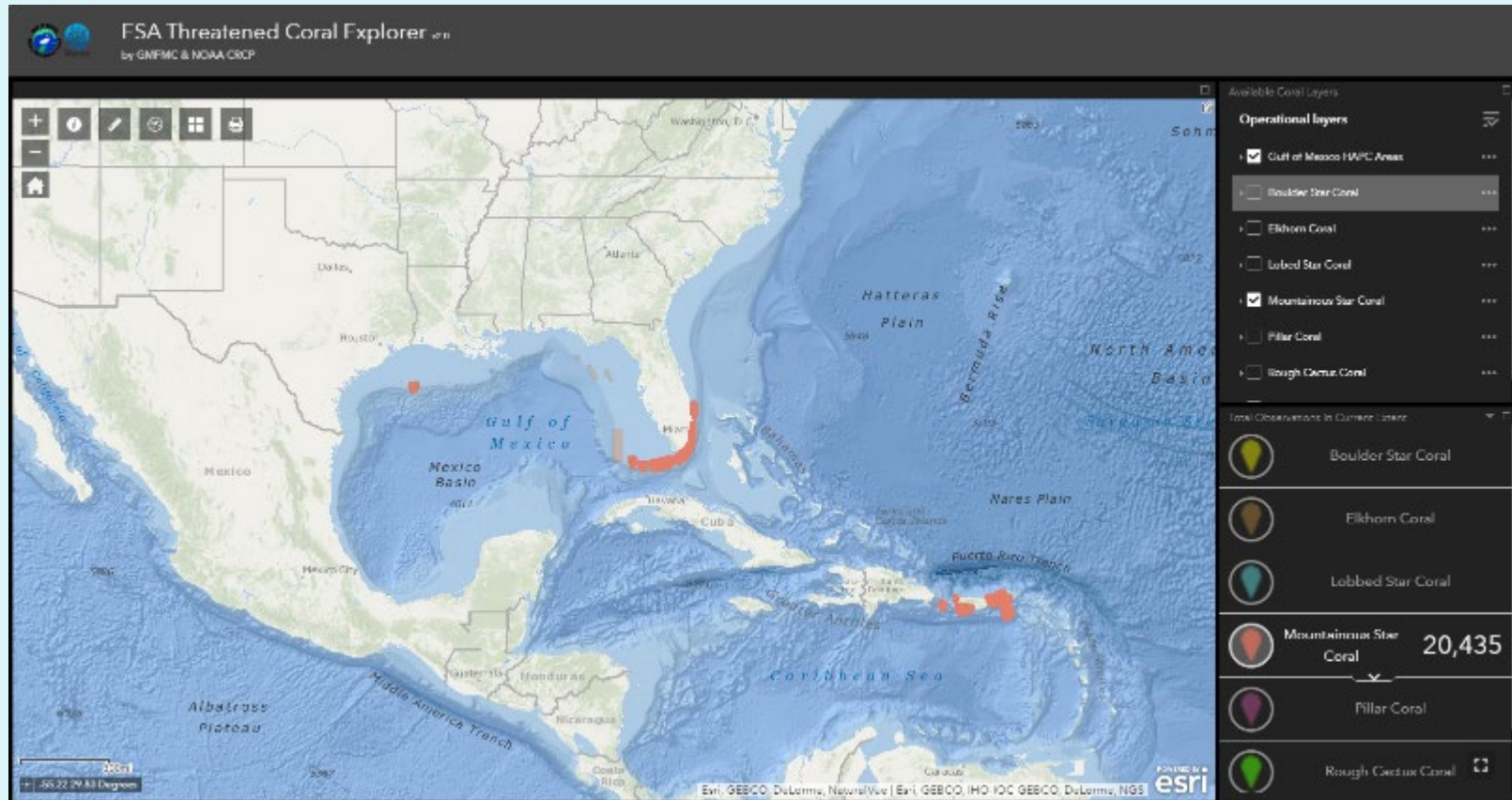
# Outreach Materials

Pamphlets on [ESA listed coral species](#) and a field guide for common coral species from the Gulf are available in hard copy and as downloadable [electronic pdf format](#) on the portal.



# Outreach Materials

We coordinate with federal, state agencies and partners to host ESA coral observation data in the Coral Portal. A new ESA Coral Explorer web application has been developed and can be accessed online at <https://portal.gulfcouncil.org/ESACoralDB.html>



# Focus on Spatial Management

Documenting climate change in the EEZ that may affect the health of corals and translating that information to the public

- Compile climate, biological and environmental data into a platform that is user friendly for managers and the public.
- Develop spatially explicit model incorporating climate change and its potential effects on coral reefs.
- Develop a white paper and learning module describing climate change, storm activity and other habitats linked to coral reef health.



# Task 2: Spatial Management

Coral Amendment 9 (approved in November 2020) establishes 13 new HAPC with fishing regulations, designates 8 new areas without fishing regulations, and modifies the regulations in 3 existing areas.

Revised 11/16/2018

## **Coral Habitat Areas Considered for Habitat Area of Particular Concern Designation in the Gulf of Mexico**



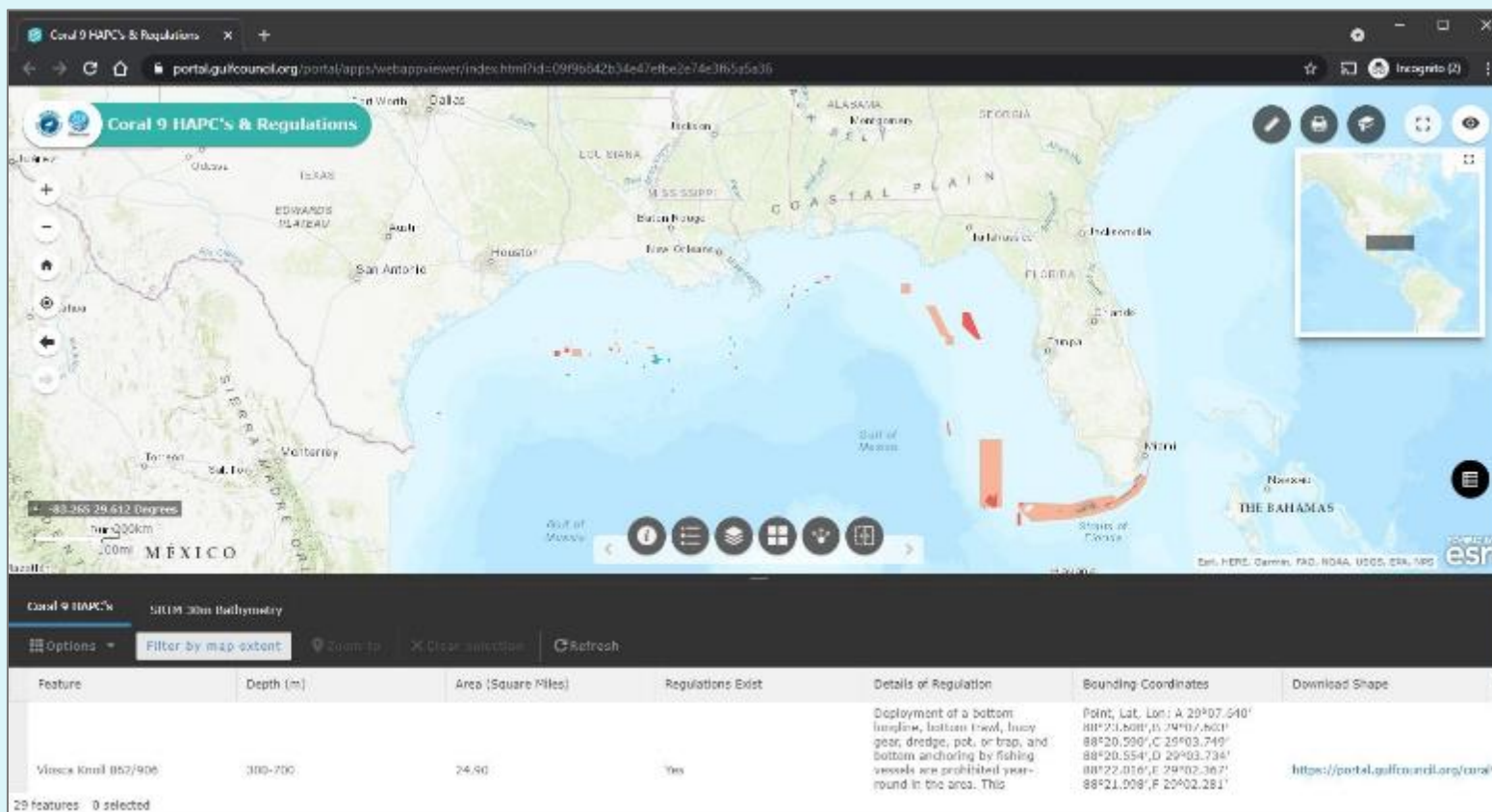
### **Final Amendment 9 to the Fishery Management Plan for the Coral and Coral Reefs of the Gulf of Mexico, U.S. Waters**

**Including Final Environmental Impact Statement**

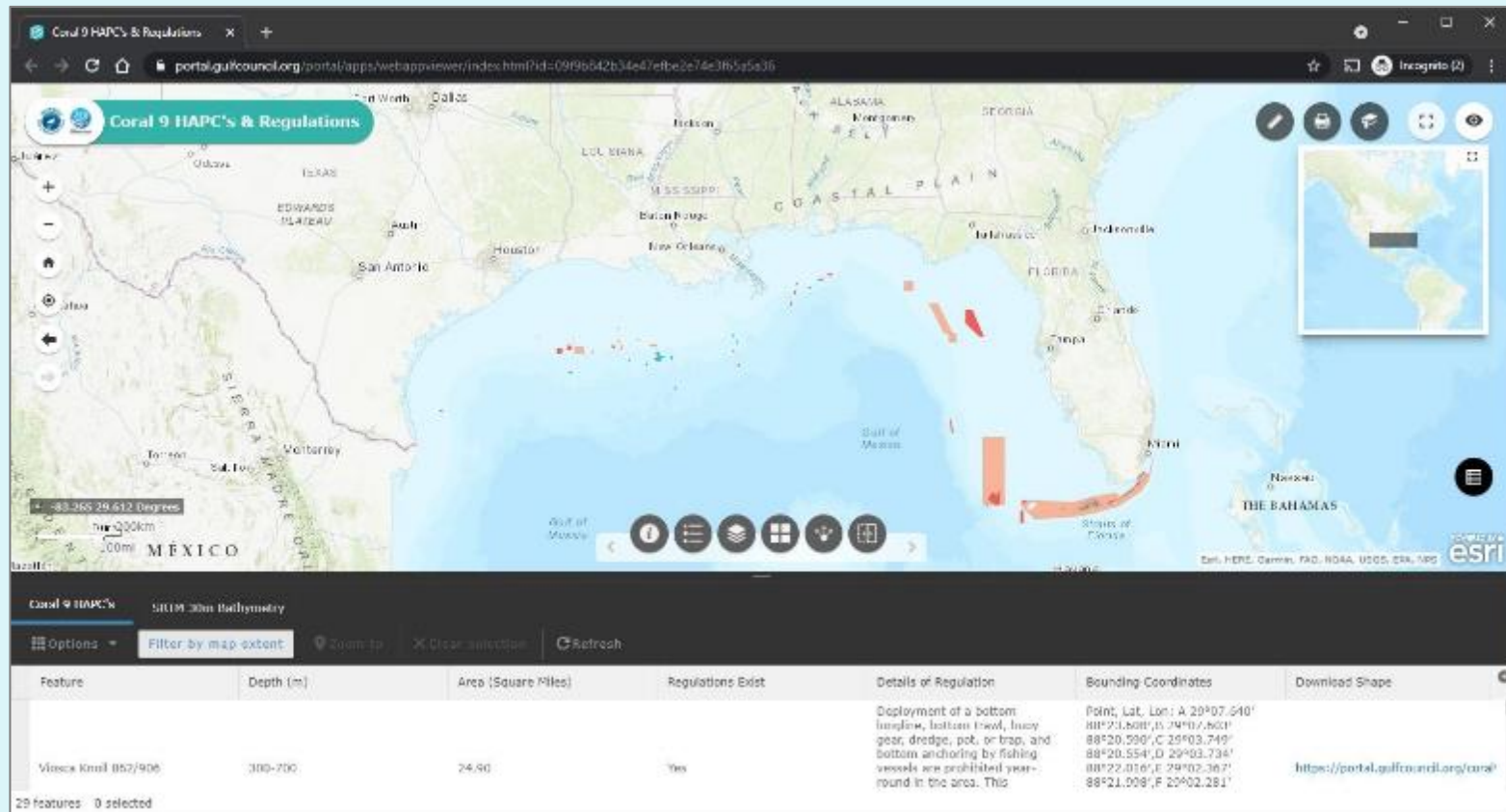
**November 2018**

# Outreach Materials

New Gulf HAPC explorer application showcased existing regulated areas and new Coral 9 designated HAPC areas online and could be used as REST API service. The application can be accessed from <https://portal.gulfcouncil.org/coral9.html>



# Gulf HAPC Explorer Live Demo

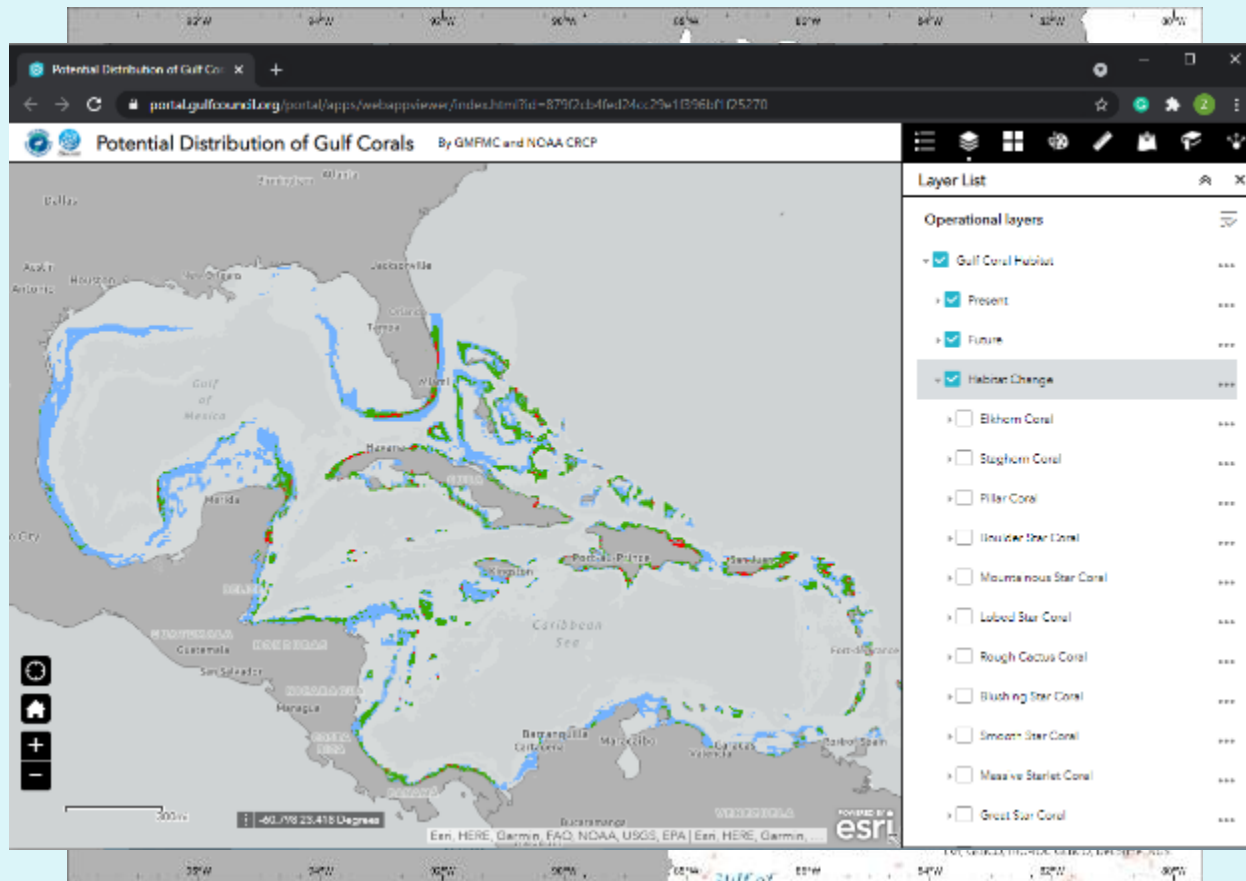


<https://portal.gulfcouncil.org/coral9.html>



# Predictive Models for Gulf Corals

Developed spatially explicit models for common coral species in the Gulf including the projection for future change in habitat due to the effect of climate change. Results from the models could be explored using interactive application from <https://bit.ly/3sFf9s3> and detailed analysis and results are available from the [whitepaper](#).



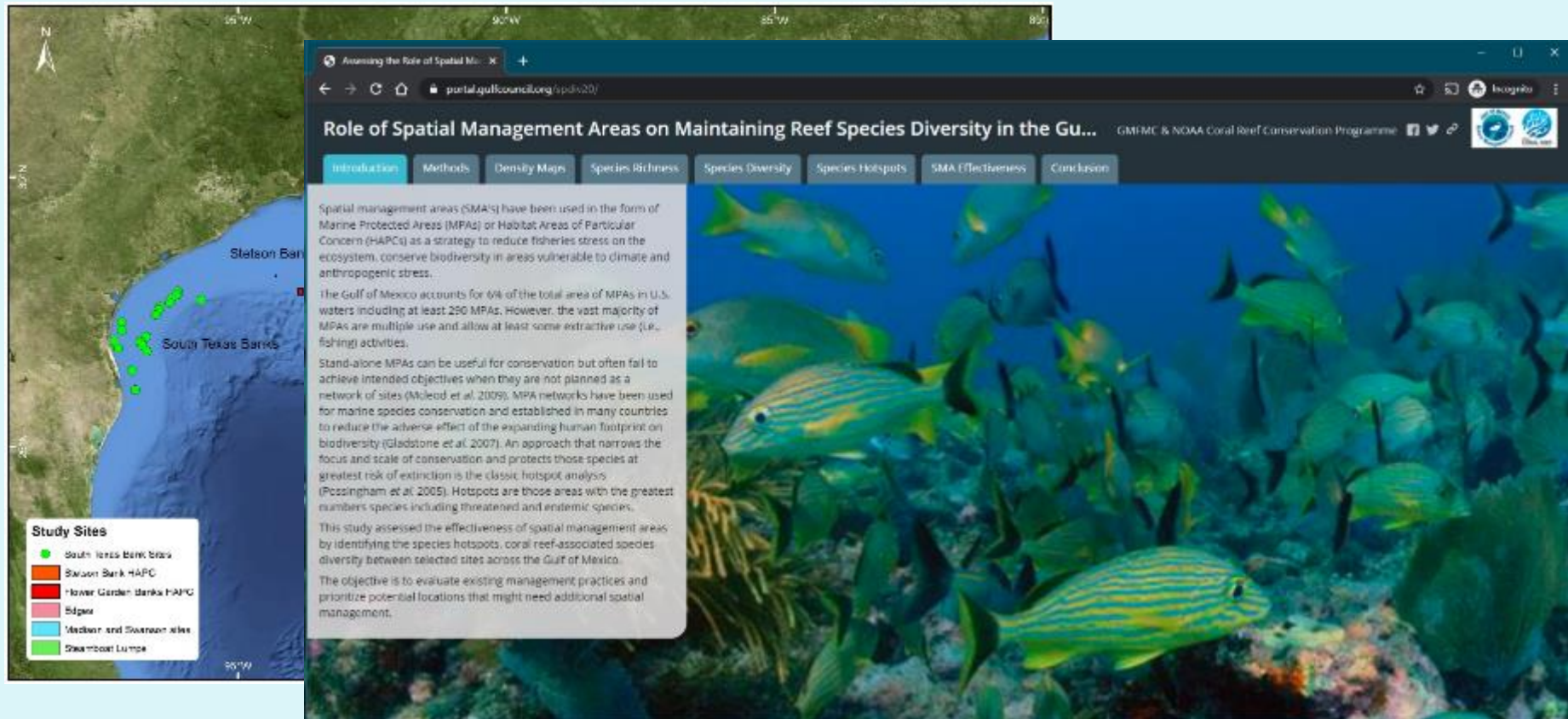
# Task 3: Updating Baseline

Assessing effectiveness of spatial management areas and coral reef associated species diversity between selected sites across the Gulf of Mexico

- Conducting a Gulf-wide review of existing literature in collaboration with federal and academic partners to evaluate the effectiveness of MPAs in the Gulf by developing hotspot maps of selected sites and comparing them to appropriate control sites.
- Provide a Gulf-wide hotspot map of coral and fish species richness and analysis to evaluate the effectiveness of spatial management areas with current form of fishing gear regulation in conserving corals and reef fishes.
- Learning module to raise awareness on deep sea coral species in the gulf.

# Assessing The Role of Spatial Management

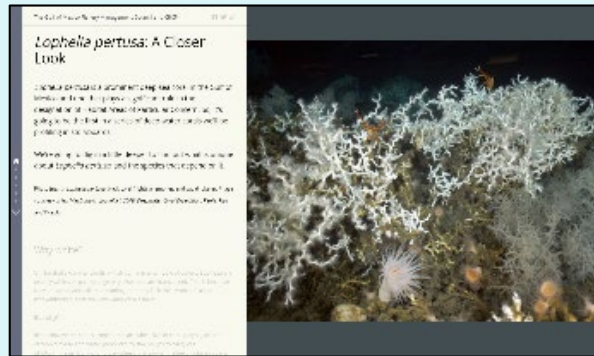
Effectiveness of selected spatial management areas were evaluated and at the same time analyzed species (coral, fish, and invertebrate) diversity of these sites. Outputs from the analysis is available in the [whitepaper](#) and results could be explored using interactive application available from <https://portal.gulfcouncil.org/spdiv20/>



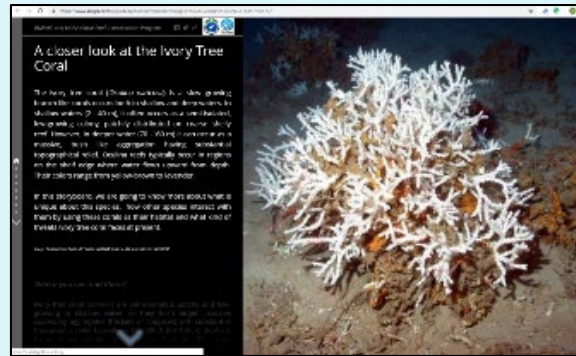


# Outreach Materials

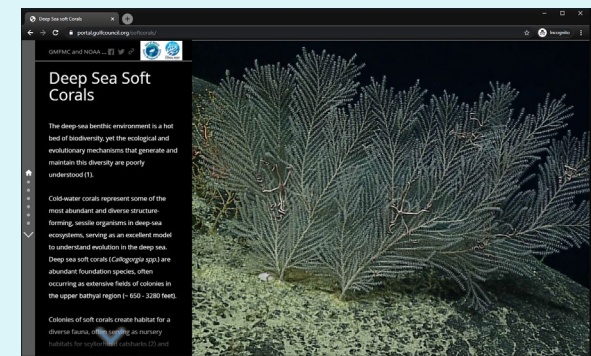
Learning modules on the deep sea coral species in the Gulf.



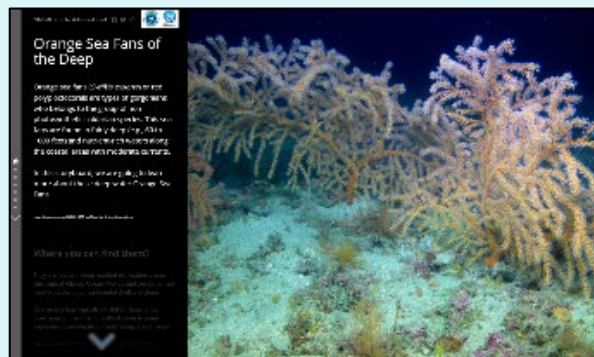
Lophelia (*Lophelia pertusa*)



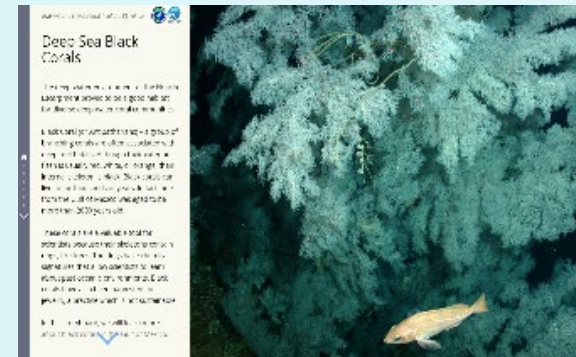
Ivory Tree Coral (*Oculina varicosa*)



Soft Corals(*Callogorgia spp.*)



Orange Sea Fans (*Swiftia exserta*)



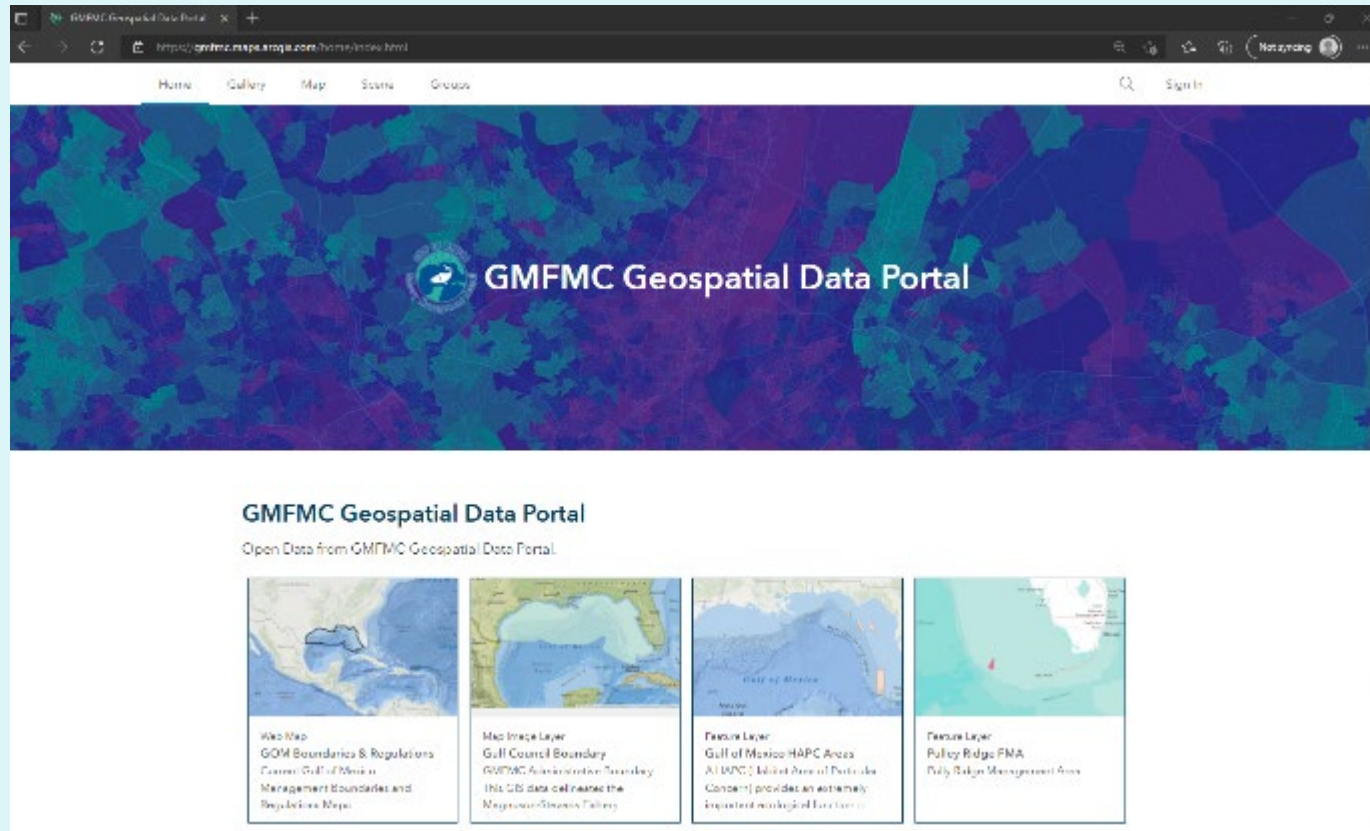
Black Corals (*Antipathes sp.*)



Ancient Corals (*Leiopathes spp.*)

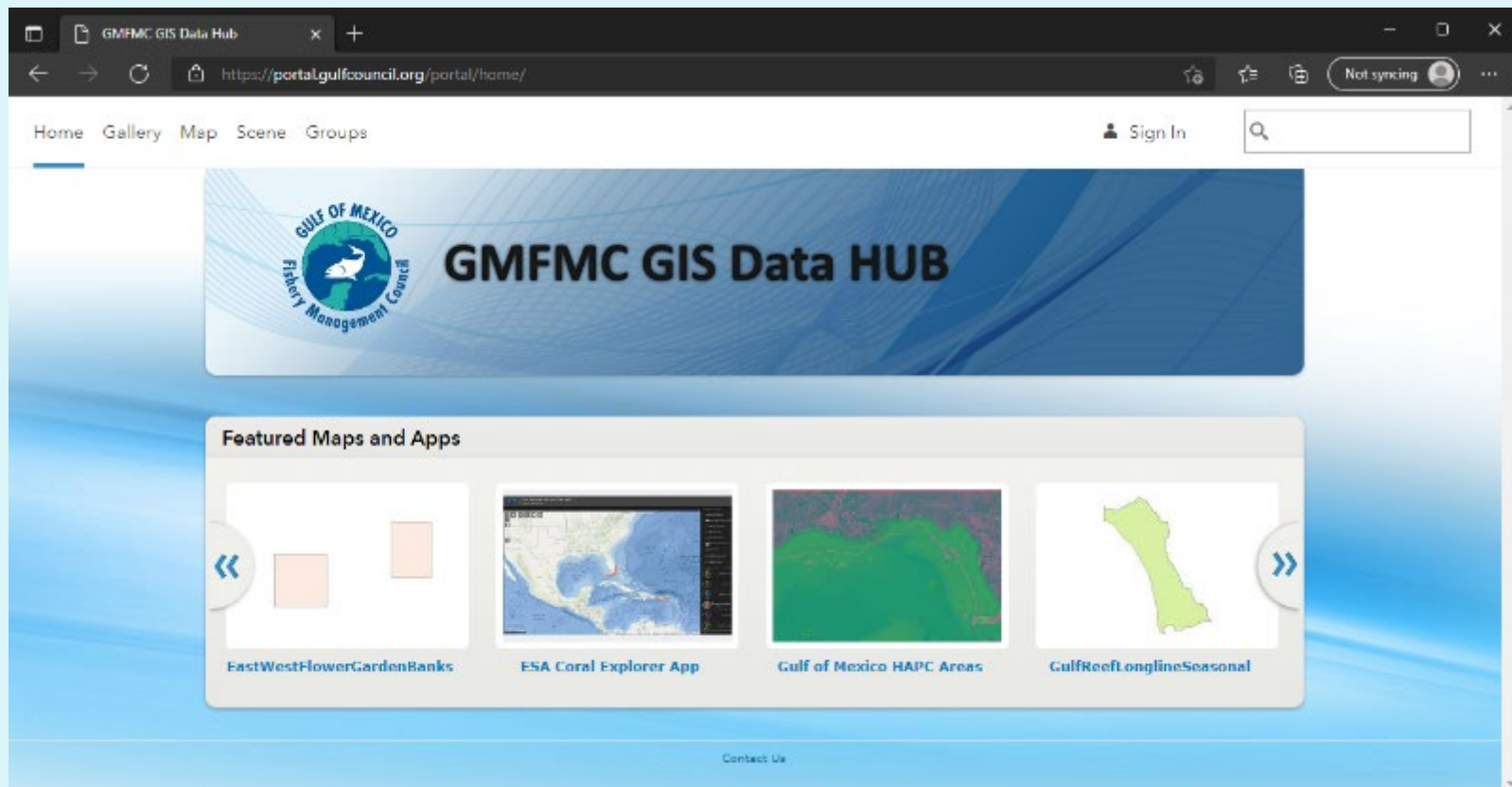
# Improvements in Web Services

Geospatial Open Data Portal for Public at  
<https://gmfm.mc.maps.arcgis.com/home/index.html>



# Improvements in Web Services

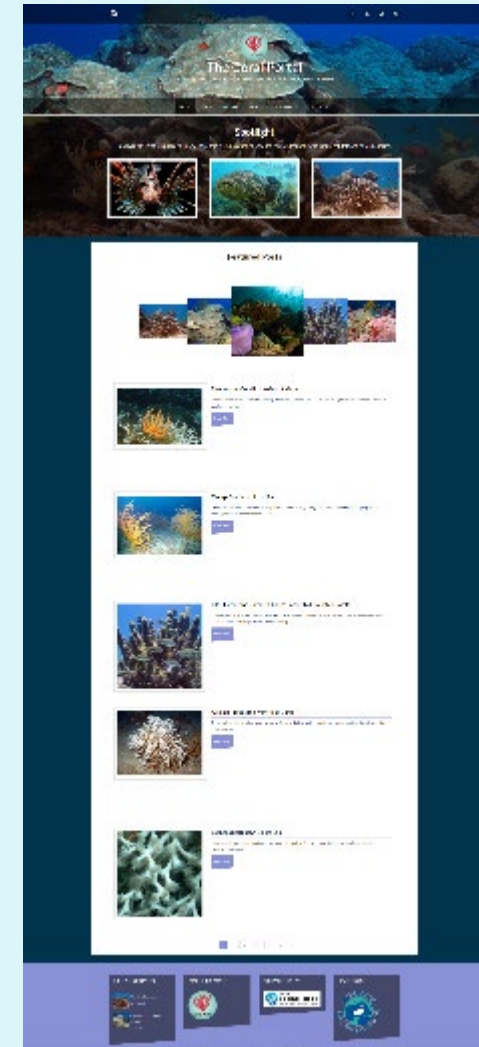
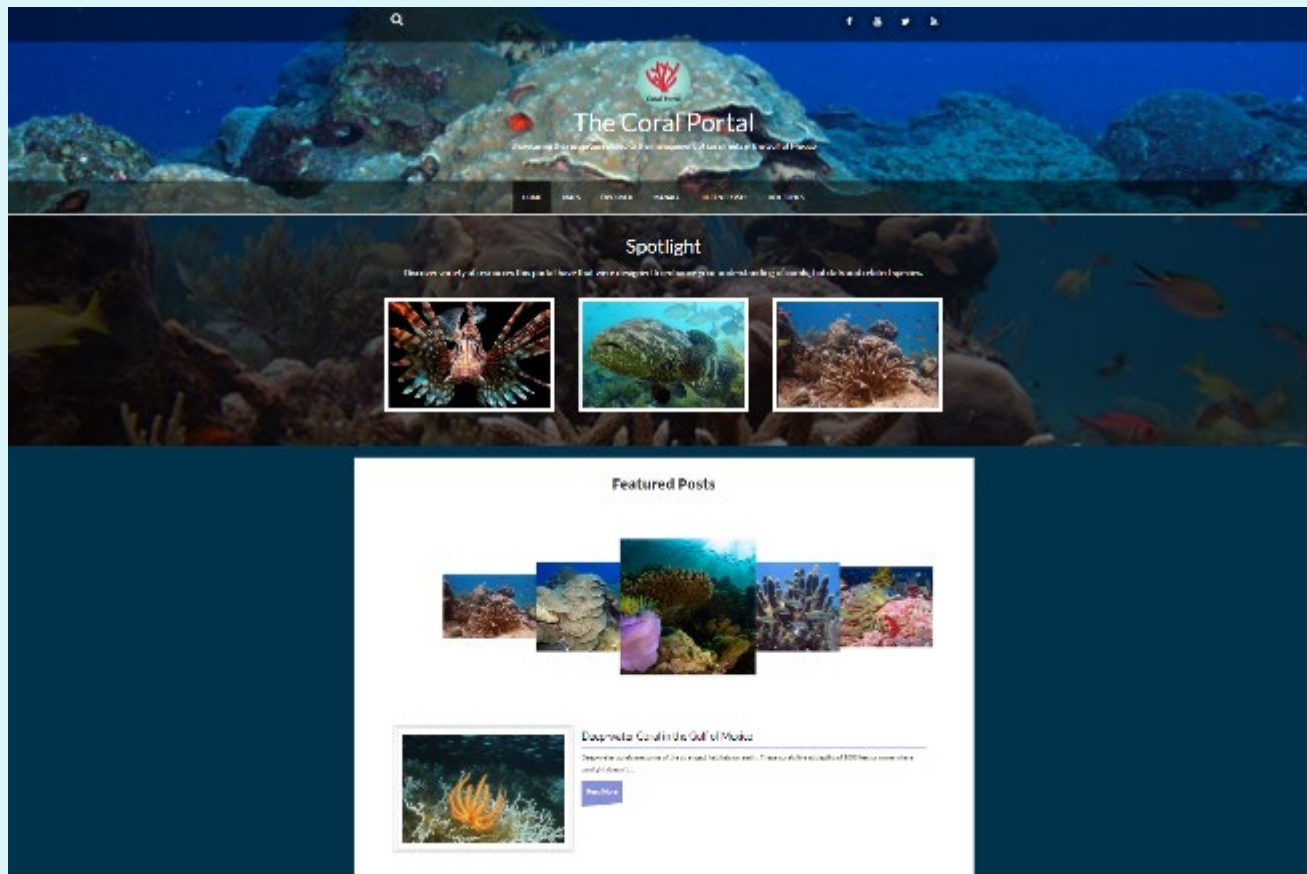
Upgraded new GIS server to host Council produced Geospatial Data for both internal and external use via REST services available from <https://portal.gulfcouncil.org/portal>





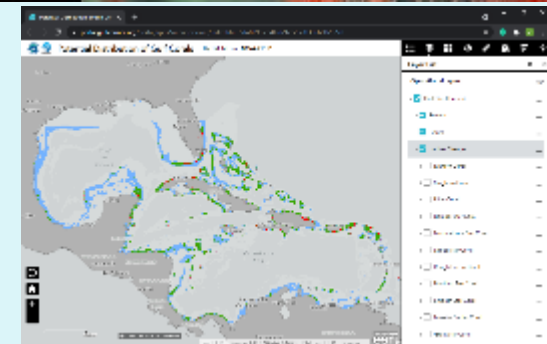
# Improvements in Web Services

New Coral Portal with news, products and apps



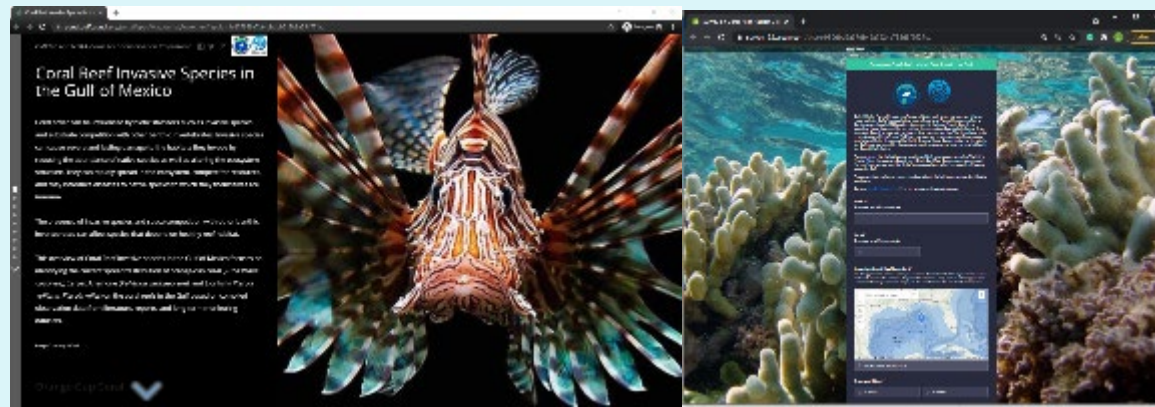
# Outreach Materials Summary

- ESA Coral Pamphlets and dive booklet
- New Coral Portal & Geospatial Server
- Learning modules & whitepapers
- Interactive web applications



# Future Tasks

- Continue work on the new CRCP project which has focus on fishery connectivity, invasive species and environmental stressors role in coral reef habitat in the Gulf.
- Producing new learning modules, web applications and white papers from ongoing analysis.





# Questions & Discussion

