

Coral Reef Conservation Program Grant Update

Zeenatul Basher, PhD

Coral and Habitat Biologist

Gulf of Mexico Fishery Management Council Meeting

Galveston, TX

October 21, 2019



Coral Reef Conservation Program Grants

2011-2013 Grant Cycle Inspiring deep-sea learning

- Deep-sea ecosystems
 - Biologically important
 - Little known outside scientific community
- Print and digital posters highlighting Deep-sea species & ecosystems (e.g., ecosystems of the deep & creatures of the deep)
- Wide-spread distribution of outreach materials
- Developed more digital content

2014-2016 Grant Cycle Expanding digital content

- Coral, EFH, HAPC, Spiny Lobster, Lionfish Mapper Applications
- Developing species-habitat models, learning modules and Decision Support Tools
- Communicate and coordinate with other management partners in coral ecosystem management efforts through workshops and outreach materials

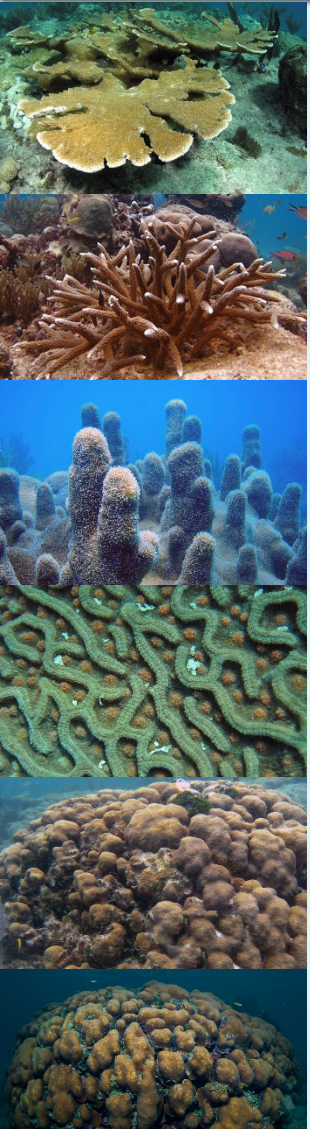


What does the current grant include?

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



Focus on Endangered Coral Species



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

Task 1: ESA Corals

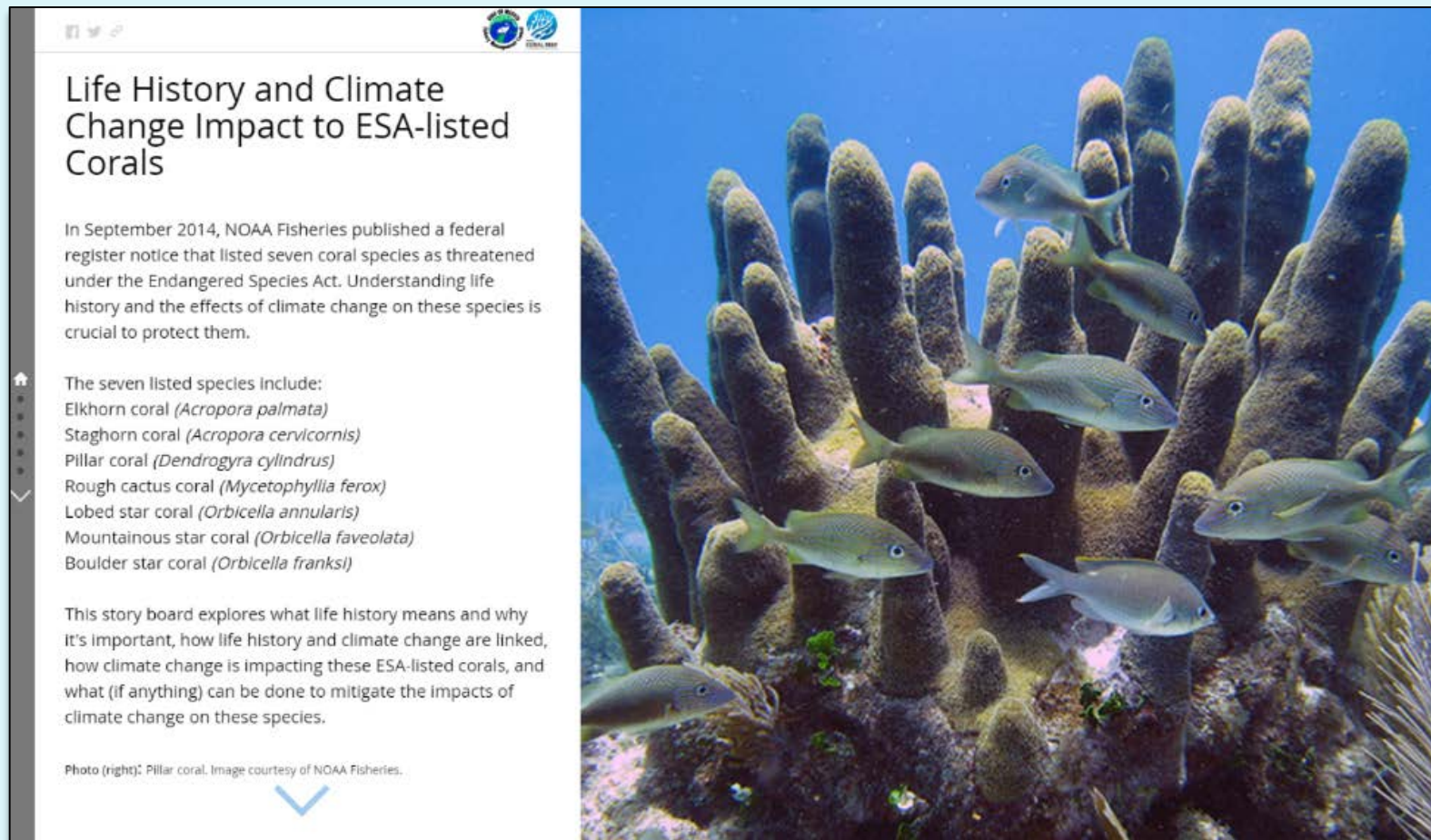
Assessing our understanding and importance of the 2014 listing of threatened coral, their abundance, and distribution in the Gulf of Mexico.

- Identify baseline abundance and distribution of ESA coral species in the gulf region.
- Generate story maps 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 with up-to-date information.



Outreach Materials

Storyboard on life history and Climate Change Impacts to ESA-listed corals. This 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

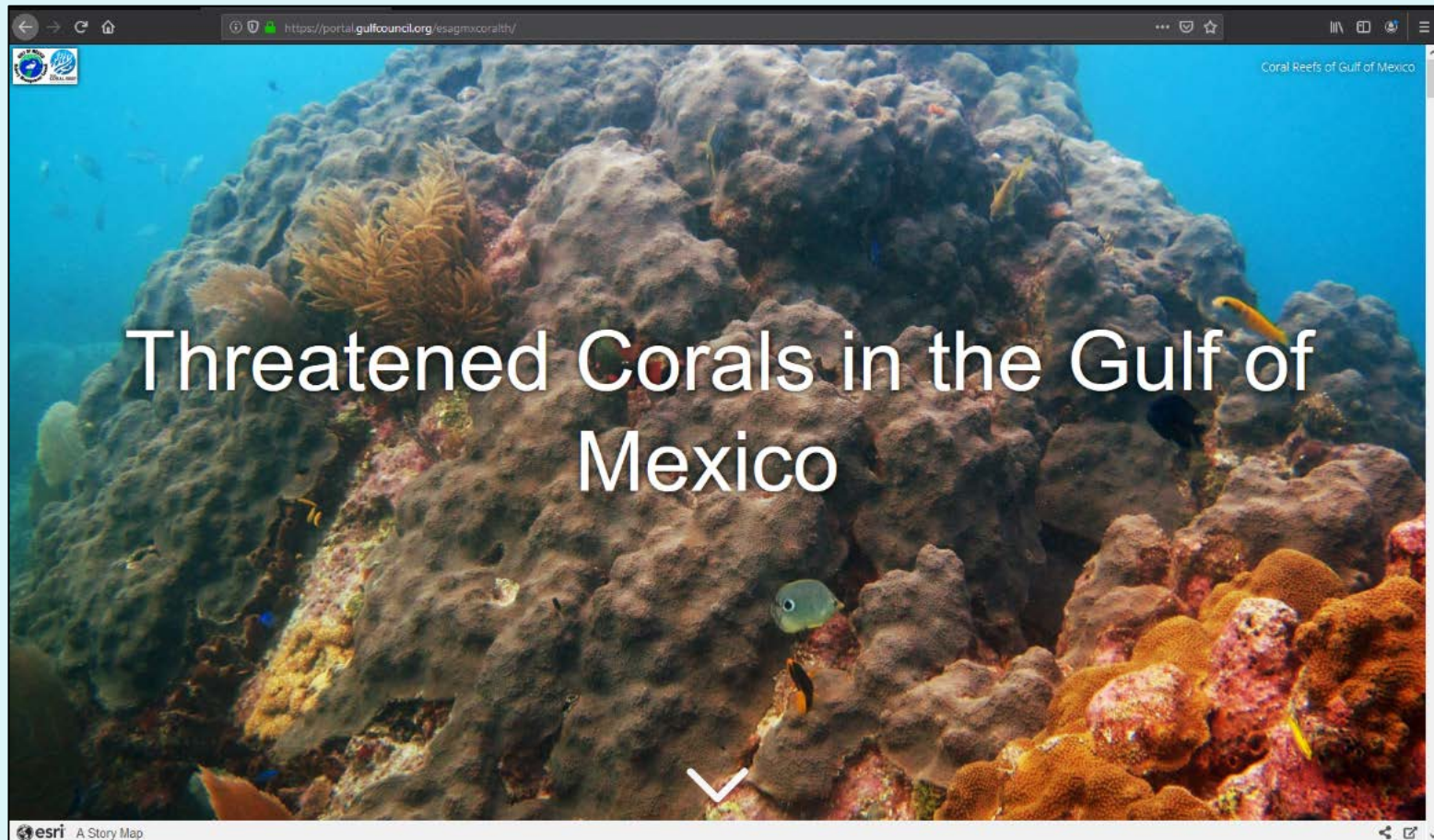
Storyboard on causes and consequence of coral reef decline. The storyboard can be accessed online at <https://portal.gulfcouncil.org/CoralDecline.html>



Causes and Consequences of Coral Reef Decline

Outreach Materials

Storyboard highlighting the life history and threats specific to ESA listed individual shallow-water coral species in the Gulf of Mexico. It can be accessed online at <https://portal.gulfcouncil.org/esagmxcoralh/>

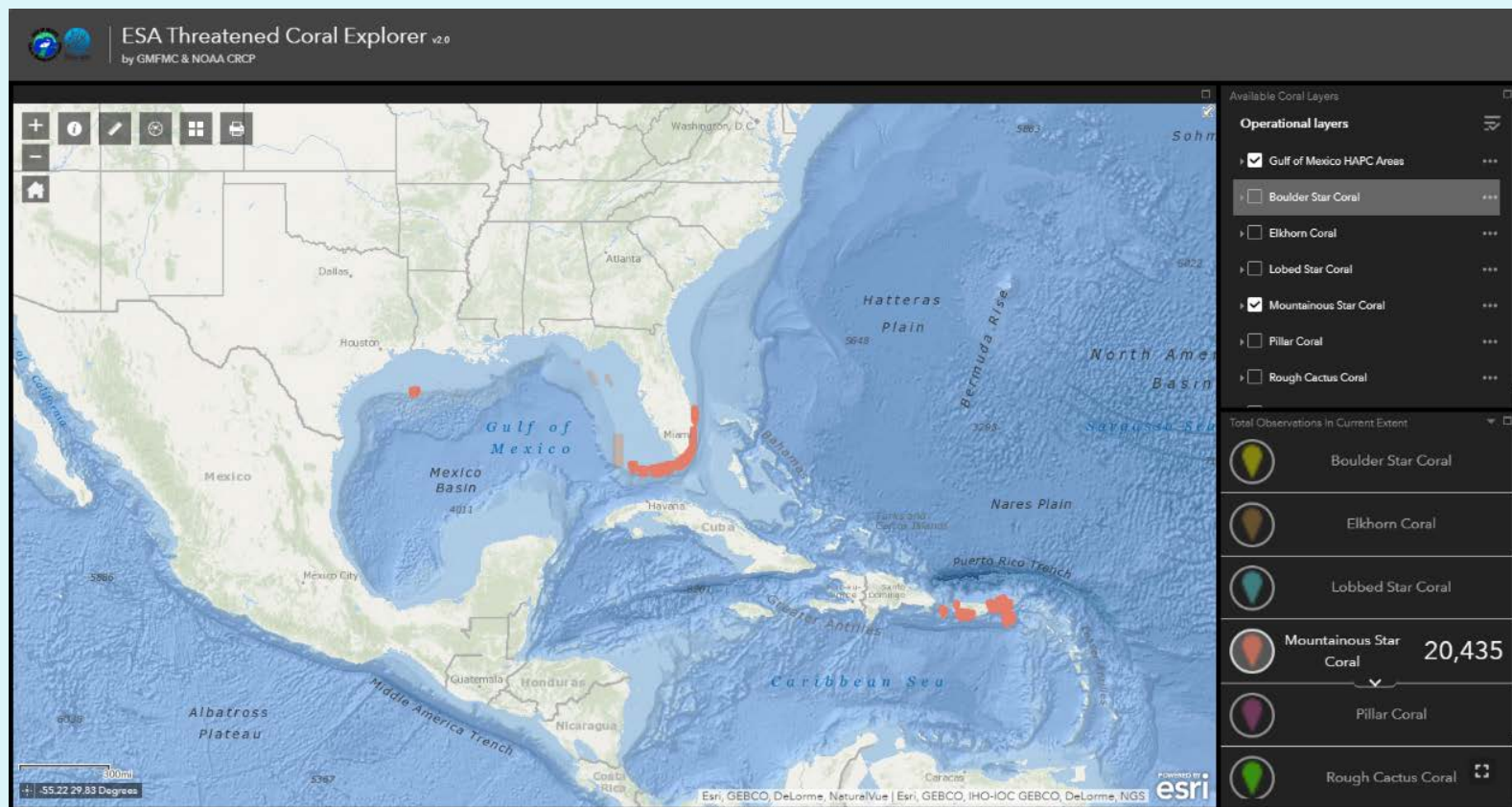


Pamphlets on ESA listed coral species were produced and will be available in electronic form on the coral portal soon. We are also in the process of preparing Coral ID booklets that divers could use. These booklets will also link to additional information about corals from the coral portal.

[illegible][illegible]

Outreach Materials

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



Task 2: Spatial Management

Documenting changing environmental conditions in the Gulf of Mexico, how it might 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 a model of coral reef distribution in the gulf in response to anticipated climate change.
- Develop a white paper and learning module describing these changes in habitats linked to coral reef health.



Spatial Management Products

Coral Amendment 9 was submitted to NOAA Fisheries Nov 2018. FRN (84FR50814) issued on 26 September 2019, open for public comments until November 25, 2019.

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

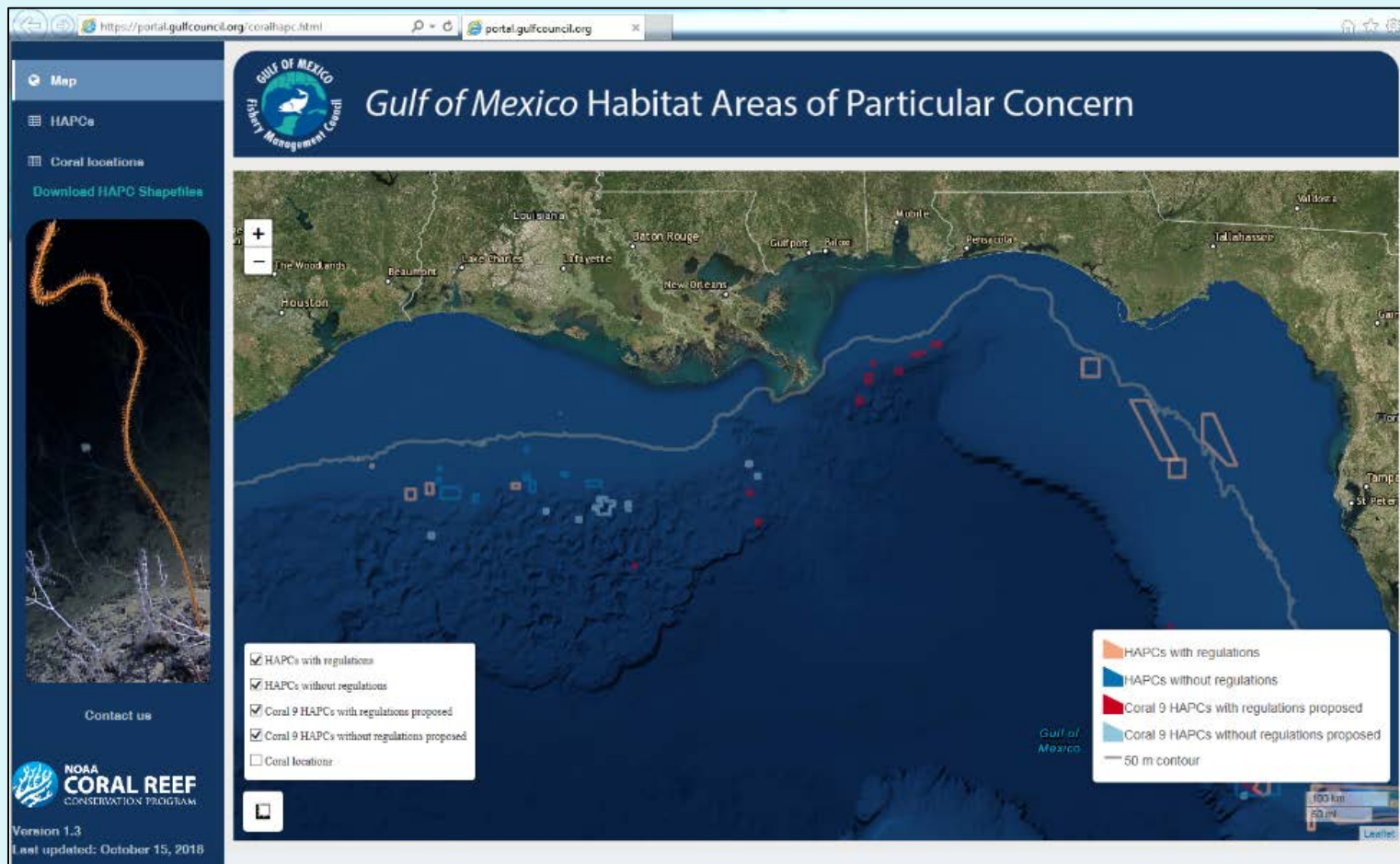
Including Final Environmental Impact Statement

November 2018



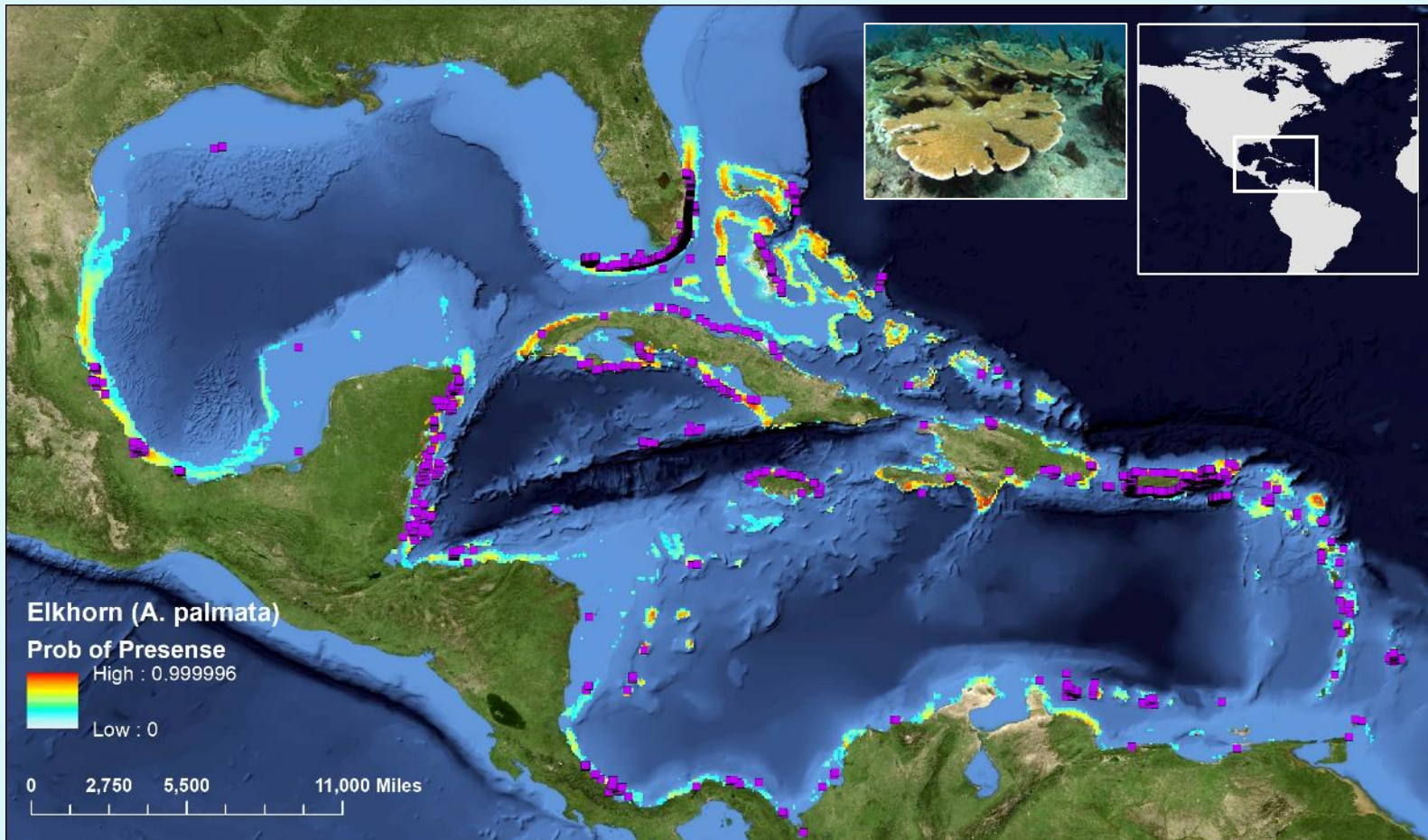
Outreach Materials

HAPC explorer with new recommended regulation areas and HAPC area shapefile download option. Accessible at <https://portal.gulfcouncil.org/coralhapc.html>



Predictive Models

Developing spatially explicit models for ESA coral species in the Gulf.



Task 3: Updating the Baseline

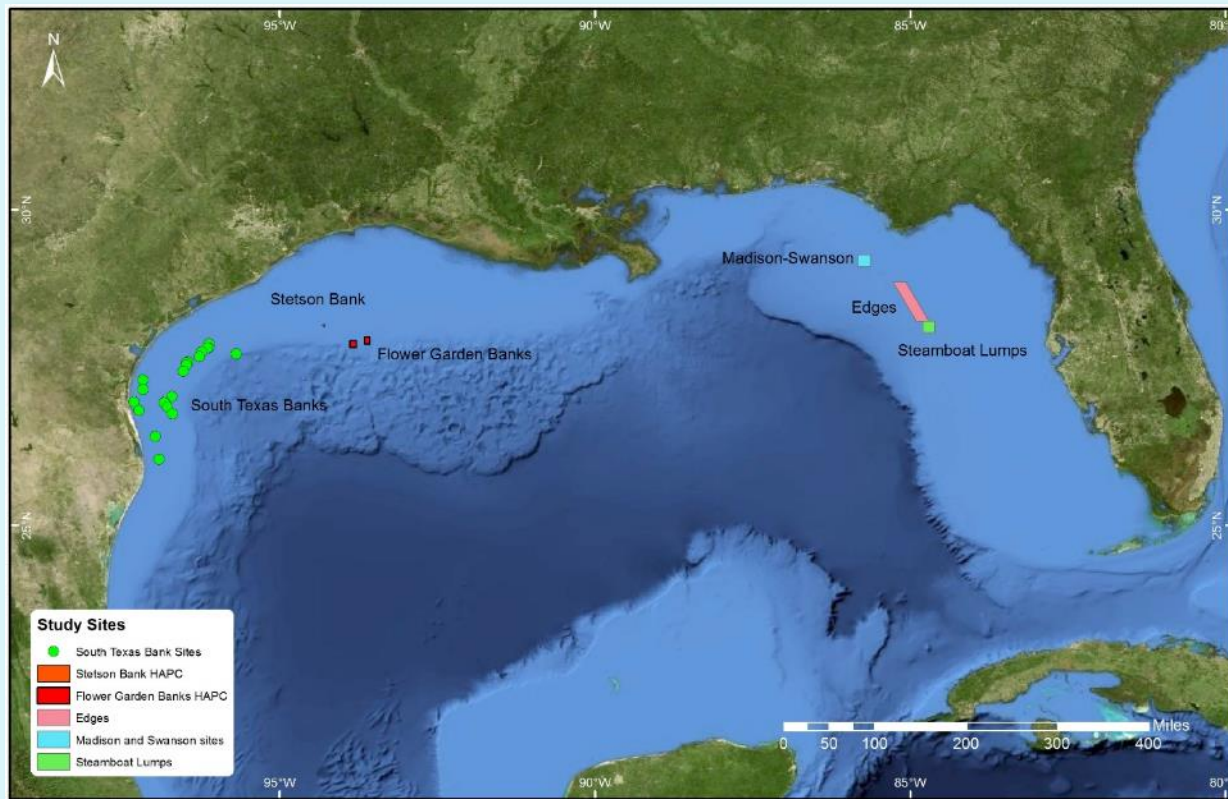
Assessing effectiveness of spatial management areas and coral reef associated species diversity between selected sites across the Gulf of Mexico

- 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 species 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 the current form of fishing gear regulation in conserving corals and reef fishes.
- Story maps to raise awareness on deep sea coral species in the Gulf.



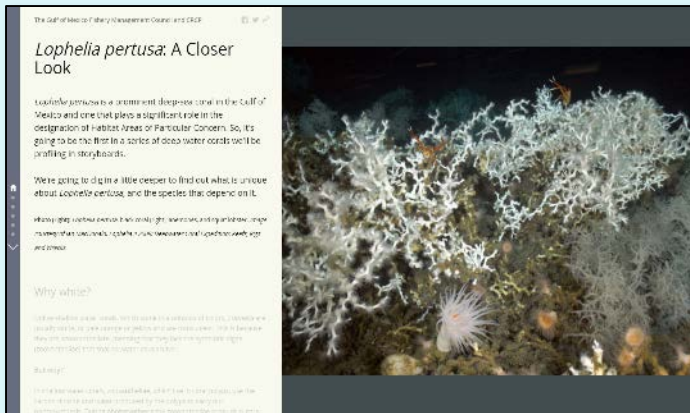
Compare MPA/Non-MPA Sites

Compiling coral and other species data from Flower Garden Banks and Stetson Bank and compare them with data from South Texas and Madison-Swanson and Edges and Steamboat Lump sites. Hotspot maps of coral and other fish species richness will be generated and analyzed to evaluate the effectiveness of spatial management areas.

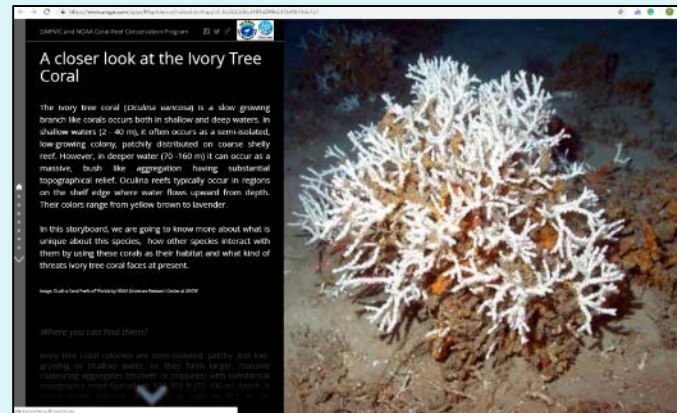


Outreach Materials

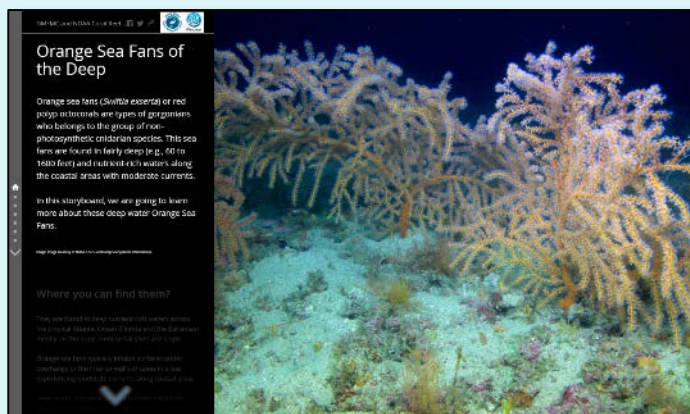
Story board on the deep sea coral species in the Gulf.



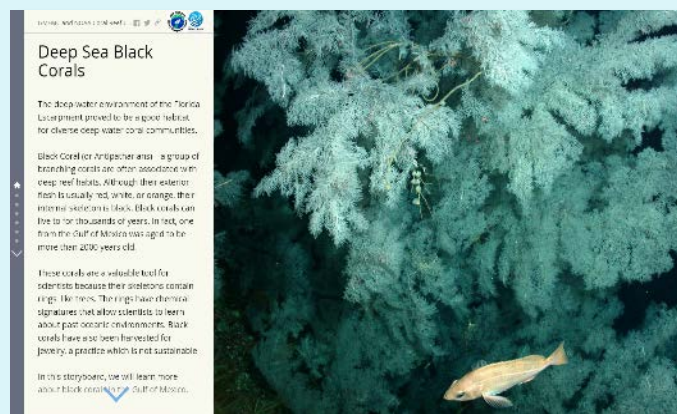
Lophelia (Lophelia pertusa)



Ivory Tree Coral (*Oculina varicosa*)



Orange Sea Fans (*Swiftia exserta*)



Black Corals (*Antipathes* sp.)

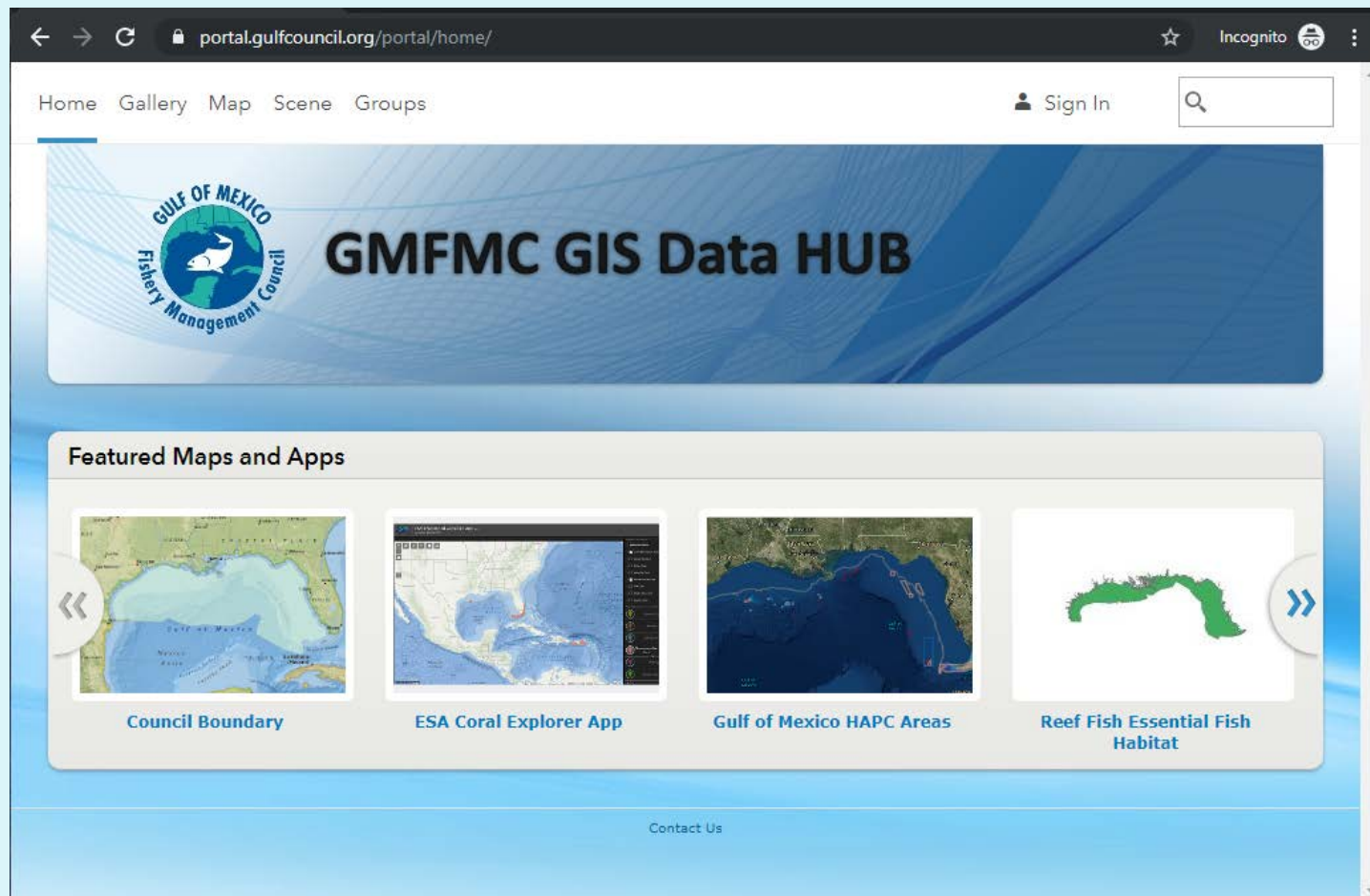


Improvements in Internal Services and Outreach



Improvements in Data Management

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



Spatial Data Sharing

New Public Geospatial Open Data Portal at
<https://gmfmc.maps.arcgis.com/>



The screenshot displays the GMFMC Geospatial Data Portal website. The top navigation bar includes links for Home, Gallery, Map, Scene, and Groups, along with a search icon and a Sign In button. The main header features the GMFMC logo on the left and the title "GMFMC Geospatial Data Portal" in large, bold letters, with a "beta" tag on the right. Below the header, a section titled "GMFMC Geospatial Data Portal Open Data" contains four featured items, each with a map thumbnail and a title: "Gulf Council Boundary", "Gulf of Mexico HAPC Areas", "Pulley Ridge FMA", and "Report a Goliath Grouper Interaction". The footer contains links for Help, Trust Center, Legal, Contact Esri, Report Abuse, and Contact Us. The GMFMC logo is also present in the bottom right corner of the page.

Home Gallery Map Scene Groups Sign In

 **GMFMC Geospatial Data Portal** *beta*

GMFMC Geospatial Data Portal Open Data

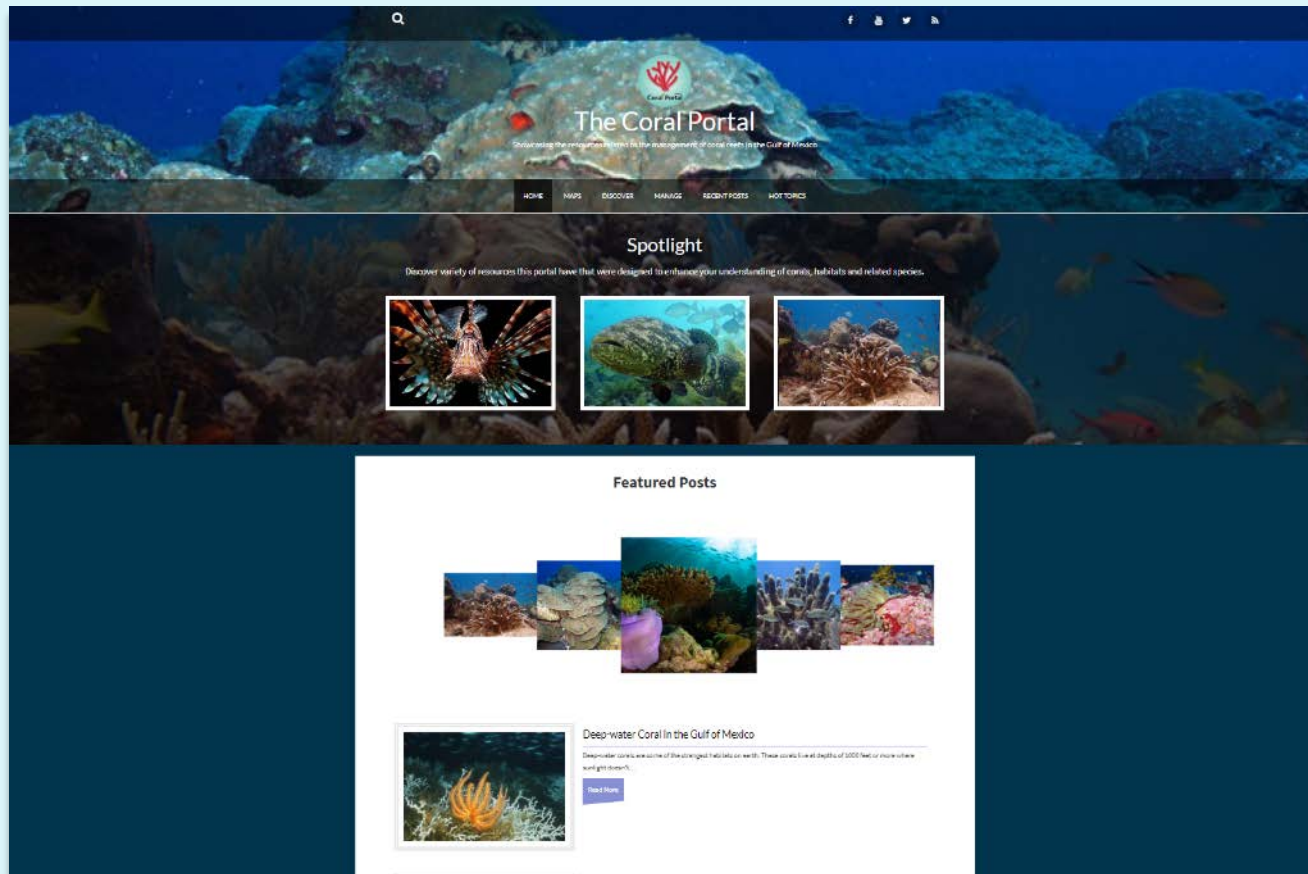
-  Gulf Council Boundary
-  Gulf of Mexico HAPC Areas
-  Pulley Ridge FMA
-  Report a Goliath Grouper Interaction

Help Trust Center Legal Contact Esri Report Abuse Contact Us

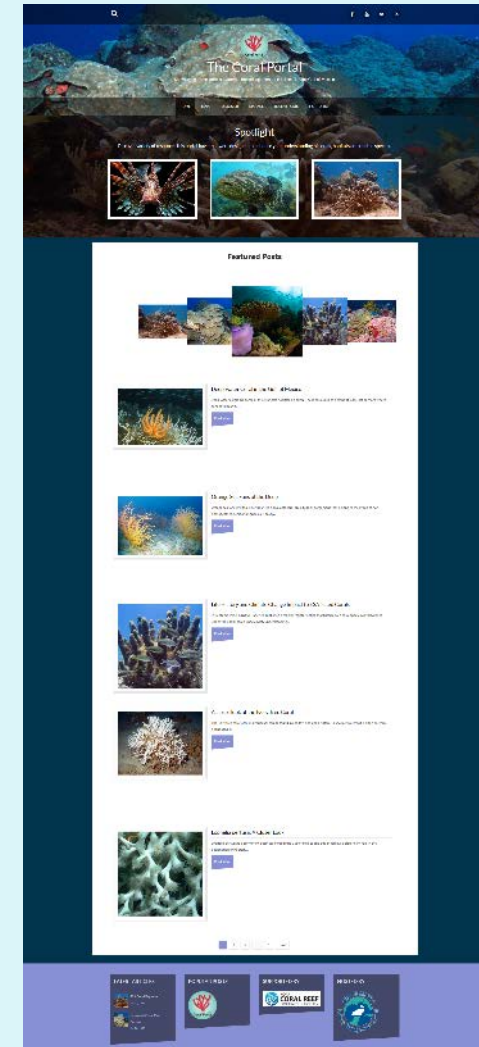


Improvements in Coral Portal

New enhanced Coral Portal



<https://portal.gulfcouncil.org/cp>



Summary of Outreach Materials

Existing Products

- Storyboards on different shallow and deep-sea corals
- ESA Coral Pamphlets
- New Coral Portal
- GMFMC Geospatial Server



Coming Soon

- Dive booklets of common corals in the Gulf of Mexico
- Models showing current and future distribution of corals in the Gulf.
- White papers and storyboards of additional coral species and from ongoing analysis showing effectiveness of current managed / Non-managed sites



Questions & Discussion

