

An aerial photograph of a coral reef system. The water is a vibrant turquoise color, and the reef is a mix of brown and green. A small boat is visible in the lower right quadrant of the image. The top of the image has a dark blue background with a white silhouette of a coral reef structure.

GULF of MEXICO

Coral Reef

PRELIMINARY REPORT CARD

2019
A TRINATIONAL INITIATIVE

Led by Harte Research Institute and UNAM-Sisal

GULF of MEXICO

Preliminary Coral Reef Report Card 2019 A Trinational Initiative

CORAL REEFS are IMPORTANT!

The Gulf of Mexico (GOM), a region shared by three countries, is one of the most diverse and productive ecosystems in the world. Its coral reefs are biologically diverse habitats, of high cultural and economic significance.

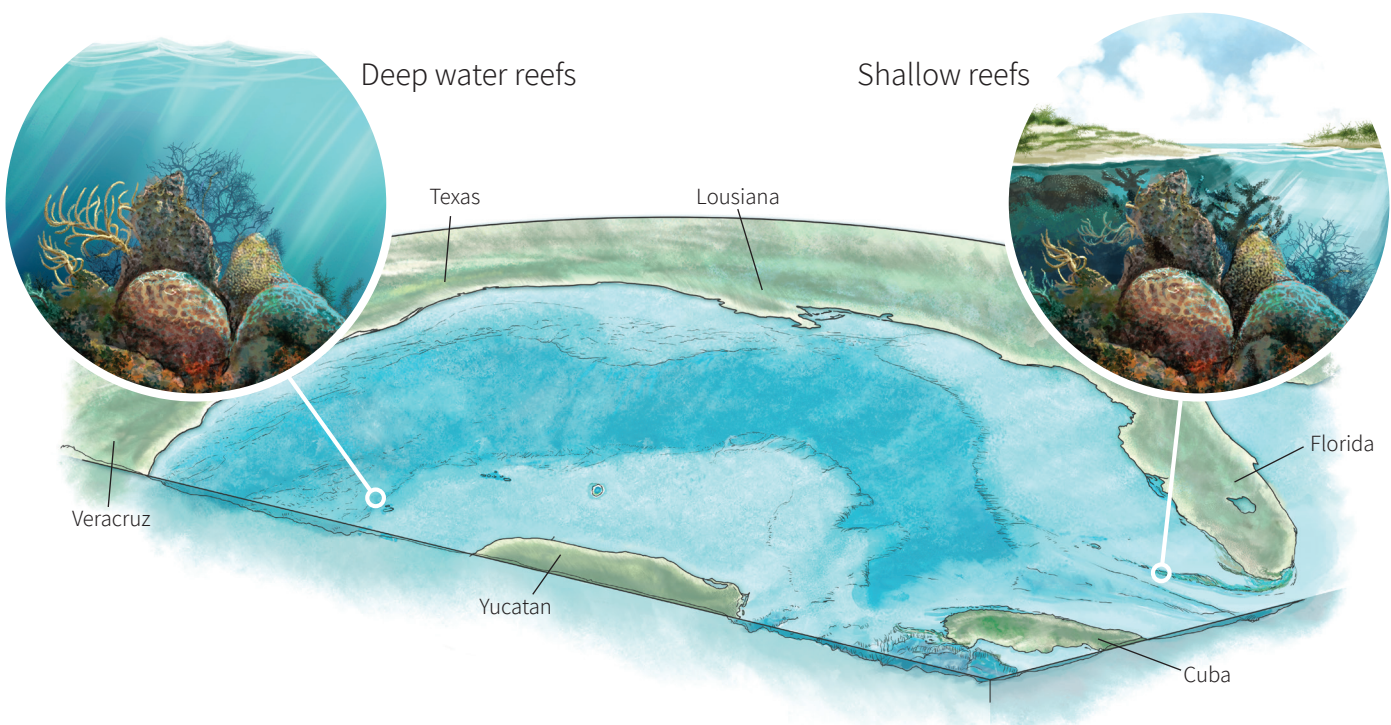
Coral reefs provide billions of dollars in food, jobs, recreational activities, coastal protection, and other important goods and services to people in the GOM, so maintaining healthy coral reefs is key to a sustainable future for this region.

THREATS to CORAL REEFS

Coral reefs are sensitive ecosystems that thrive in clean waters in shallow and deep areas. However, factors at both global and local scales can disrupt these ecosystems. Ocean warming and acidification, as a result of increased greenhouse gas emissions, affect reefs around the world. A reduction of these stressors will benefit coral reefs. Other threats are overfishing, coastal development, unregulated tourism and land-based sources of pollution, but these threats urgently need to be managed at a local level.

NEED for a TRINATIONAL EFFORT

Coral reefs in the GOM are diverse and interconnected between Mexico, the United States, and Cuba. Since 2007 these countries united in the Trinational Initiative to coordinate actions to better understand, protect, and manage marine ecosystems. In the GOM, different types of coral reefs are found with many species and services that depend on each other. However, declines in coral reef health have had an impact on the ecological, social, cultural, and economic benefits of people and communities.



INDICATORS of CORAL REEF ECOSYSTEM HEALTH

The following indicators of coral reef ecosystem health were prioritized by workshop participants based on the importance and feasibility of quantitative measurement at a trinational level.

STRESSED



COASTAL POPULATION DENSITY
the number of people living near a reef



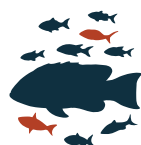
SEA TEMPERATURE
the surface temperature to help predict thermal stress events



WATER QUALITY
the condition of the water for reef growth



FISHERIES
the amount of artisanal, recreational, commercial, or subsistence fishing



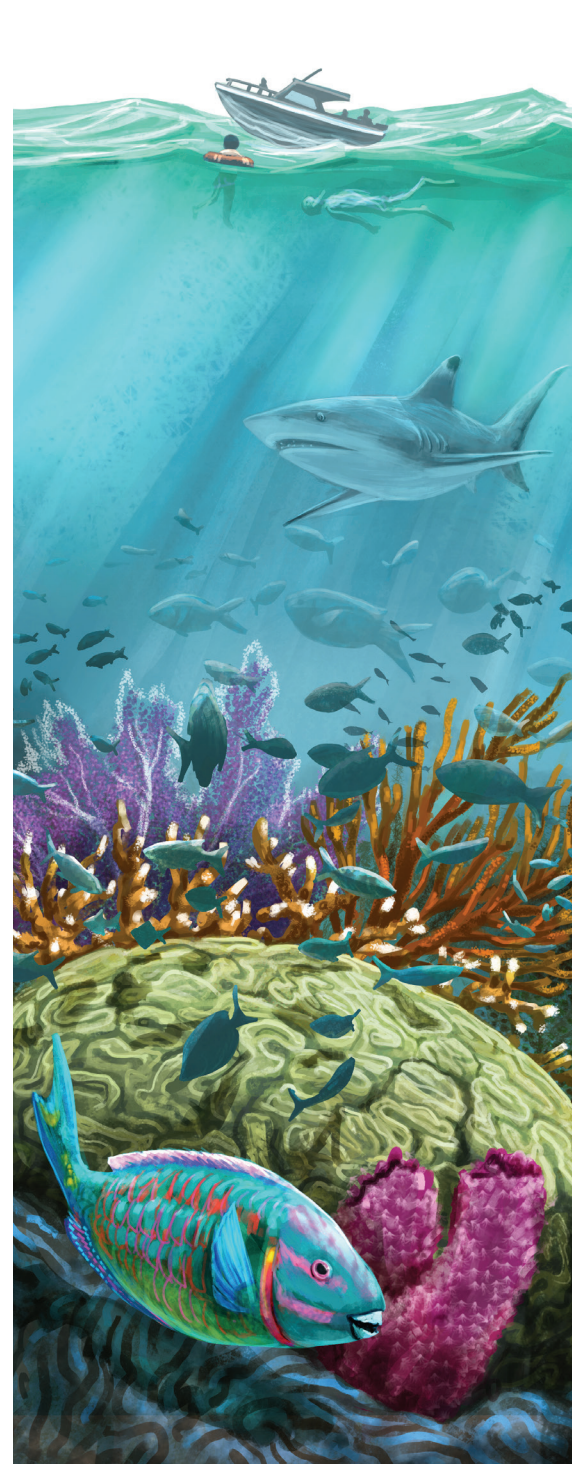
FISH ABUNDANCE
how many reef fish are present



CORAL COVER
the percentage of the bottom that is reef-building coral



DESIRED



Success Story:

RedGolfo

Gulf of Mexico Marine Protected Area Network (RedGolfo)

RedGolfo is connecting resource managers, building capacity for protected area management and creating uniform methodologies, like the GOM Coral Reef Report Card to monitor changes in shared ecosystems.

RedGolfo emerged out of decades of collaboration between the three countries that share the GOM. Since 2007 marine scientists from Cuba, Mexico, and the USA meet regularly as part of the Trinational Initiative. In the spirit of science diplomacy, this platform charts the course toward the study and protection of shared marine resources such as corals, sea turtles, and sharks. In 2014, scientists recommended the creation of an MPA network between Cuba and the USA. A sister sanctuary program between the two countries was announced and soon after Mexico added seven protected areas to the network making it a truly Gulf-wide effort.

Learn more at

<http://www.trinationalinitiative.org>



Photo: Isai Dominguez Guerrero

NORTHERN GULF

The Flower Garden Banks are an extremely productive and diverse coral reef ecosystem. These banks thrive due to their remote offshore location and cooler waters of the deep Gulf. It remains crucial to protect life on the banks from threats related to climate change, invasive species, water quality degradation, and unsustainable human activities.

SOUTHWEST GULF

Coral reefs in the southwest gulf are mainly shallow reefs. Unfortunately, these reefs are the most threatened in the entire GOM and are affected by intense fishing, river discharge, large urban centers, harbors, ports, and nearby oil fields. Nevertheless, coral reefs in the area are home to important marine species and considered to be in fair condition. They support an important local tourist industry and have demonstrated resilience.

CAMPECHE/YUCATAN REEFS

Coral reefs in the Campeche Bank are spread over a large geographic area and include Alacranes reef, Cayo Arcas, Cayo Arena, Cayo Triangulos, among others. Some reefs are smaller with some hard and soft corals, others are very shallow and even have sandy cays and islands. Other reefs are much larger and remote and are found in deeper waters. All these reefs types support commercial fisheries and have little influence from land-based pollution. In general, the reefs in Alacranes tend to meet expectations based on its coral cover, surface complexity and fish abundance. Threats in this area include overfishing, oil industry development, climate change, and coral disease.



Photo: NOAA

NORTHERN GULF

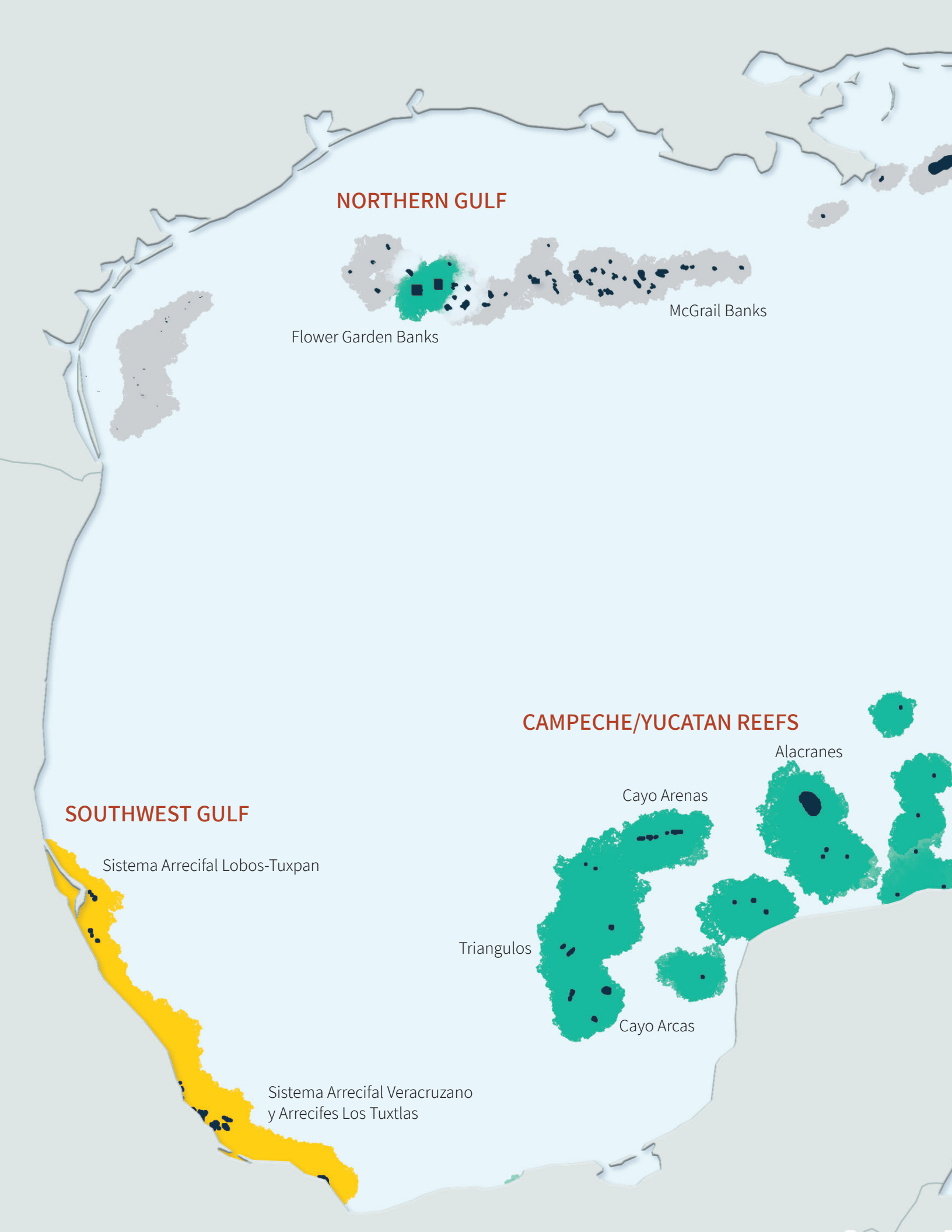
Flower Garden Banks
McGrail Banks

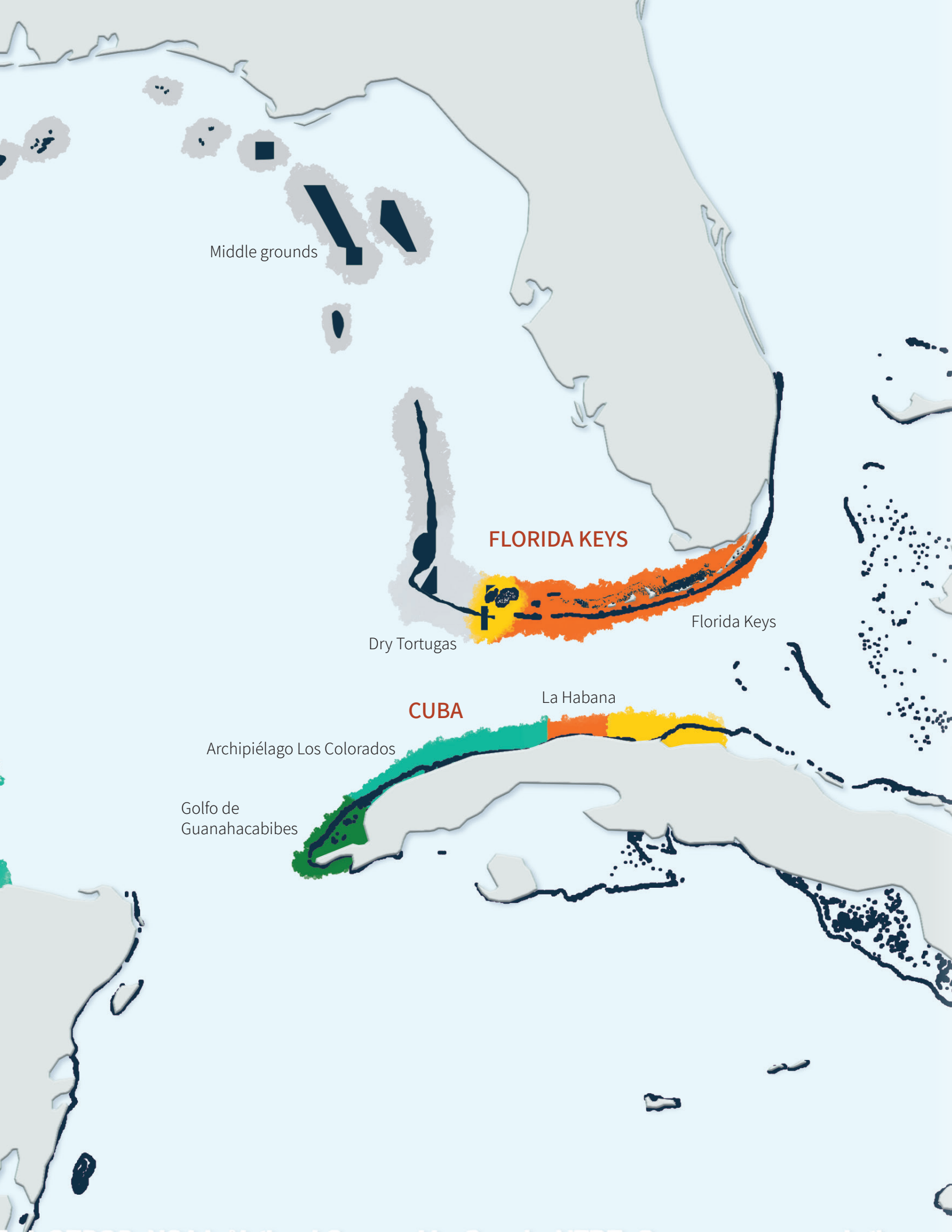
CAMPECHE/YUCATAN REEFS

Alacranes
Cayo Arenas
Triangulos
Cayo Arcas

SOUTHWEST GULF

Sistema Arrecifal Lobos-Tuxpan
Sistema Arrecifal Veracruzano
y Arrecifes Los Tuxtlas





Middle grounds

FLORIDA KEYS

Dry Tortugas

Florida Keys

CUBA

La Habana

Archipiélago Los Colorados

Golfo de Guanahacabibes

Scale Description



To describe the perceived condition of the reefs in the Gulf of Mexico, we used a spectrum of colors that ranges from green to red. The greenish represent areas with good coral cover and fish abundance and resemble areas that meet expectations of healthy reef ecosystems. Yellow and orange colors refer to areas with fair condition and red represents highly impacted areas with low coral cover considered to be below expectations. Our aim is to provide a more detailed score based on synthesized data sets for each of the indicators in a proposed follow-up report card.

FLORIDA KEYS

The Florida reef tract is the largest continuous coral reef in the continental United States and includes the Florida Keys and Dry Tortugas. Florida Keys coral reefs are some of the most visited in the United States and are threatened by climate change, overfishing, declining water quality, and coral disease. The Dry Tortugas are located offshore west of the Florida Keys and are an important source of juveniles that sustain fish and coral populations along the Florida reef tract. However, these reefs also remain vulnerable to increasing sea surface temperatures and other climate change threats.

CUBA

Cuban coral reefs systems are probably among the best preserved in the GOM. However, in some areas, reefs are highly impacted and exhibit many degradation patterns. The northwest coast of Cuba represents the lower limit of the GOM, and shows a gradient of coral health, with evidence of more degradation on reefs that are closer to highly urbanized areas, such as Havana, while those farther from the coast and less accessible have healthier conditions.

Photo:



Success Story: Discovering deep reefs in Cuba

A successful joint Cuba-U.S. marine expedition was conducted on May 14-June 12, 2017 to characterize for the first time the extent and health of mesophotic coral ecosystems (MCEs) along the entire coastline of Cuba. MCEs are deep reef systems (>30m) which tend to have low light conditions, meso means “middle” and photic “light”. MCE’s habitat along the coasts of Cuba were confirmed via Remotely Operated Vehicle (ROV) dives at 36 sites. ROV dives covered 27 km, at depths of 25-188 m, and documented diverse habitats and species. 477 benthic taxa and 178 fish species were identified. Most of the vertical walls were covered with dense sponges, algae, octocorals, and black corals. *Agaricia* spp. (lettuce coral) was most abundant on the walls at depths of 50-75 m. Of the 2,240 corals counted only less than 2% of the corals showed signs of bleaching and almost no diseases were observed. Sites outside marine protected areas generally had lower fish abundances, a possible indicator of historical overfishing. Lionfish were observed at most sites, but abundances were low compared to other Caribbean regions.



Recommendations

Next steps

Discussions at the meeting in Merida led to several important recommendations:

1. Protect coral reef ecosystems in the GOM, and
2. Improve the ability to assess the health of these ecosystems in a standard way in the three participating countries

SUGGESTIONS INCLUDE:

- Support initiatives to restore, preserve, and protect coral reefs
- Reduce fossil fuel energy consumption, water pollution, and carbon emissions to reduce climate impacts.
- Increase education about coral reefs and the benefits they provide to society.
- Follow regulations on fishing closures and size limits on marine species.
- Include social, economic, cultural, and governance indicators to enable holistic coral reef health assessments.
- Standardize data collection across the region to enable comparable ecosystem health reporting.

The workshop also identified key steps to be taken to advance these recommendations, including:

- Develop a quantitative assessment using available data that builds on the qualitative assessment created at the workshop.
- Engage a broad cross-section of stakeholders in each participating country to co-design future coral reef ecosystem assessments in the Gulf of Mexico.
- Cross-train data collection teams in each country to standardize data collection.
- Develop communication opportunities to promote the tri-national coral reef ecosystem assessment and make data available to each country.



Photo: NOAA

ABOUT THE REPORT CARD

The development of the preliminary Report Card is part of an initiative underwritten and led by the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University -Corpus Christi and UNAM-Sisal. This workshop was partially funded with kind support from William Knox Holt Foundation. The report card was developed in a workshop held in Merida, Yucatan during November 14-15, 2019 with a total of 27 participants. We followed participatory methodologies to create a report card established by The Integration and Application Network (IAN) and the University of Maryland Center for Environmental Science.

Disclaimer. The material and information contained in this report card is for general educational purposes and is based on the opinions of the participants and not the institutions hereafter. Therefore, you should not rely solely on this material as a basis to make any business, legal, or any other decisions.

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Cover photo: Daniel Martínez Hernández