

## 2013 Long-Term Monitoring at East and West Flower Garden Banks

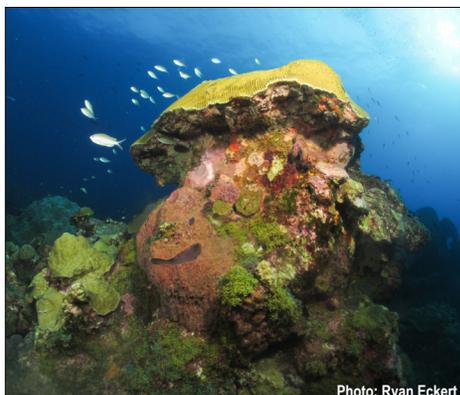


Photo: Ryan Eckert

Brown Chromis swim over the reef at EFGB.

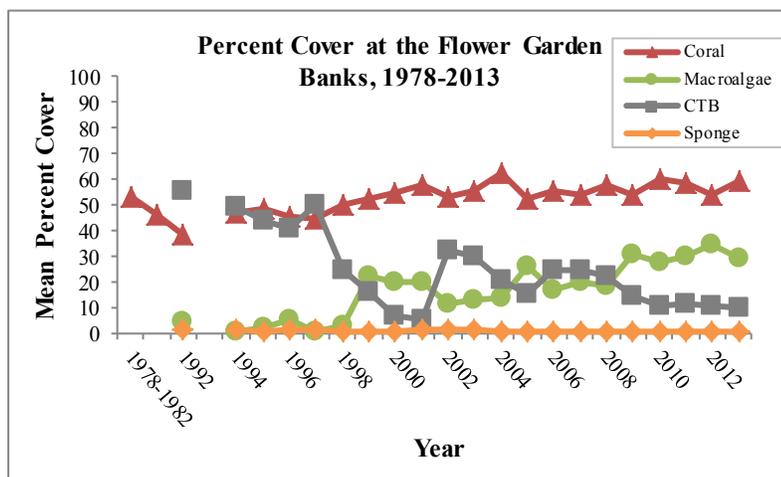
### Long-Term Coral Reef Monitoring Program

East and West Flower Garden Banks (EFGB and WFGB) are monitored on an annual basis as part of a long-term coral reef monitoring program jointly funded by NOAA's Flower Garden Banks National Marine Sanctuary (FGBNMS) and the Bureau of Ocean Energy Management (BOEM). The monitoring program was established to evaluate the potential impacts of nearby oil and gas development and to document reef health. Scientists use SCUBA to conduct random fish and coral surveys within designated 10,000 m<sup>2</sup> study sites on the reef, as well as photograph repetitive stations of the same corals year after year. In over 25 years of continuous monitoring, EFGB and WFGB have maintained levels of coral cover above 50%, suffered minimally from hurricanes, coral bleaching, and disease, and supported abundant fish populations in the northwestern Gulf of Mexico. These observations make the Flower Garden Banks one of the healthiest reef systems in the world.

### Percent Cover in 2013

In randomly photographed surveys taken along 10 meter transects throughout the study sites, the major components of cover on the reef include coral (60%), macroalgae (29%), crustose coralline algae, fine turf, and bare rock (known as CTB) (9%), and sponges (0.5%). Boulder Star Coral (*Orbicella franksi*) was the most abundant coral species at the Flower Garden Banks (FGB) in 2013, followed by Symmetrical Brain Coral (*Pseudodiploria strigosa*).

Macroalgae has increased since the beginning of the monitoring program. Historically, macroalgae cover remained less than 6%, but it increased dramatically in 1999, and has remained comparatively high ever since (12-36%). However, despite increasing macroalgae cover, coral cover remains above 50%.



Historical mean percent cover over time at the FGB.



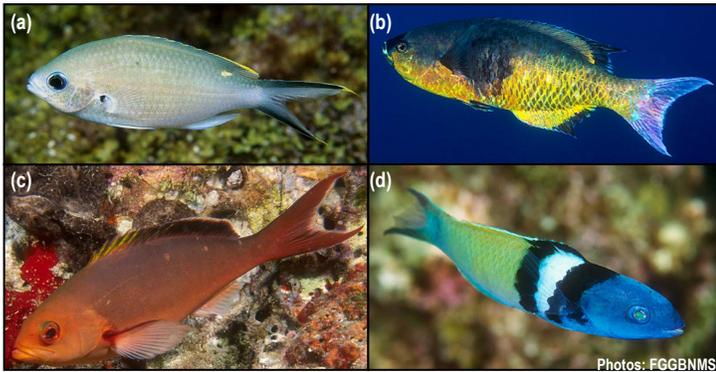
Photo: GP Schmah

NOAA diver takes a repetitive photo of a coral colony at EFGB.

### Repetitive Photo-Stations

Permanent repetitive photo-stations are monitored each year to document changes in specific coral colonies on the reef. Each repetitive photo-station is located by SCUBA divers using detailed underwater maps and the stations are photographed annually. Shallow photo-stations on the reef are located in the study sites between 60-85 foot depths and deep photo-stations are located outside the study sites between 100-130 foot depths.

In repetitive photographs, less than 1% of the coral was observed to bleach and disease was absent. Similar to the random surveys, the dominant corals were Boulder Star Coral (*Orbicella franksi*) and Symmetrical Brain Coral (*Pseudodiploria strigosa*). In the deep repetitive photo-stations, the dominant corals in this depth range were Boulder Star Coral (*Orbicella franksi*) and Great Star Coral (*Montastraea cavernosa*).



(a) Brown Chromis (b) Creole Wrasse (c) Atlantic Creolefish, (d) Bluehead.

## 2013 Fish Surveys

Fishes were visually assessed by SCUBA divers within the long-term monitoring study sites with modified Bohnsack and Bannerot surveys. The most abundant fish species was the Brown Chromis (*Chromis multilineata*), closely followed by Atlantic Creolefish (*Paranthias furcifer*), Bluehead (*Thalassoma bifasciatum*), and Creole Wrasse (*Clepticus parrae*). The most frequently sighted species observed during surveys was the Bicolor Damselfish (*Stegastes partitus*). Parrotfish and wrasses, Damselfish, and Groupers were the dominant fish families observed. Mean fish biomass (200 g/m<sup>2</sup>) was highest at WFGB.

## Lionfish Sightings

Although first observed in 2011, 2013 was the first year documenting Lionfish (*Pterois volitans/miles*) in the long-term monitoring dataset. Sighting frequency for the species in all surveys was 16.7%, ranking Lionfish the 37<sup>th</sup> most frequently sighted species of 75. These invasive species, known for their voracious appetites, venomous spines and rapid reproduction, can deplete native fish populations at alarming rates from coral reef habitats, and are a direct threat to the FGB.



Invasive Lionfish at the FGB.

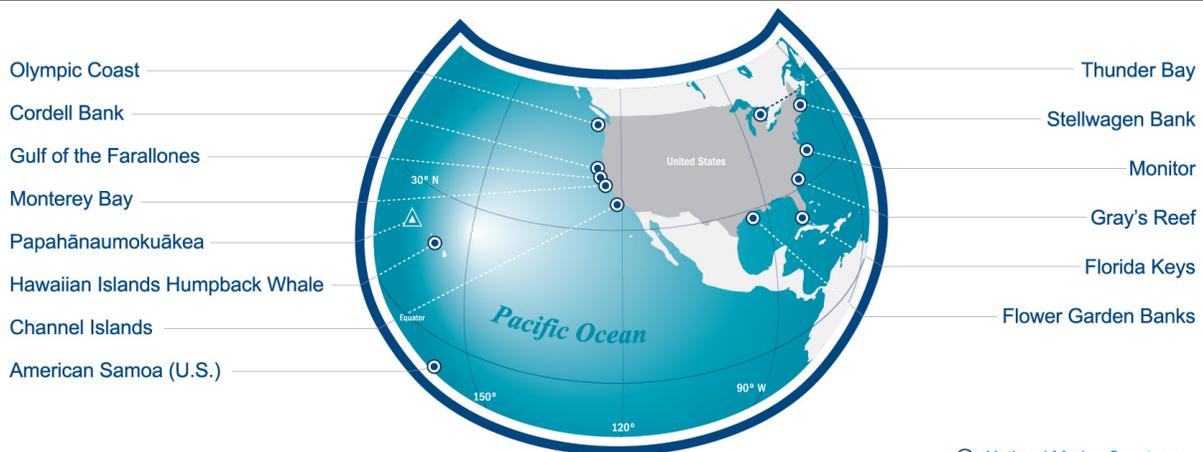


NOAA diver conducts random transect survey at EFGB.

## Conclusions

The coral reefs of EFGB and WFGB continue to be healthy and stable, when compared to other reefs that have declined in the Caribbean region. Even though the coral and fish populations are not as diverse as other reefs in the Caribbean, EFGB and WFGB contain abundant fish assemblages and coral cover above 50%. Despite continued coral cover above 50%, macroalgae cover has been increasing since 1999 (ranging from 1% to 36% since the beginning of the monitoring program). The long-term monitoring program at EFGB and WFGB is one of the longest running coral reef monitoring programs anywhere in the world. Continued monitoring will document long-term changes and will be useful for management decisions and future research focused on the reef communities and the fish populations they support.

For more information, see full report: Johnston, M.A., Nuttall, M.F. Eckert, R.J. Embesi, J.A. 2014. Long-Term Monitoring at East and West Flower Garden Banks National Marine Sanctuary: 2013 Annual Report. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Flower Garden Banks National Marine Sanctuary, Galveston, TX. 66 pp. <http://flowergarden.noaa.gov>



Scale varies in this perspective. Adapted from National Geographic Maps.

<http://flowergarden.noaa.gov>