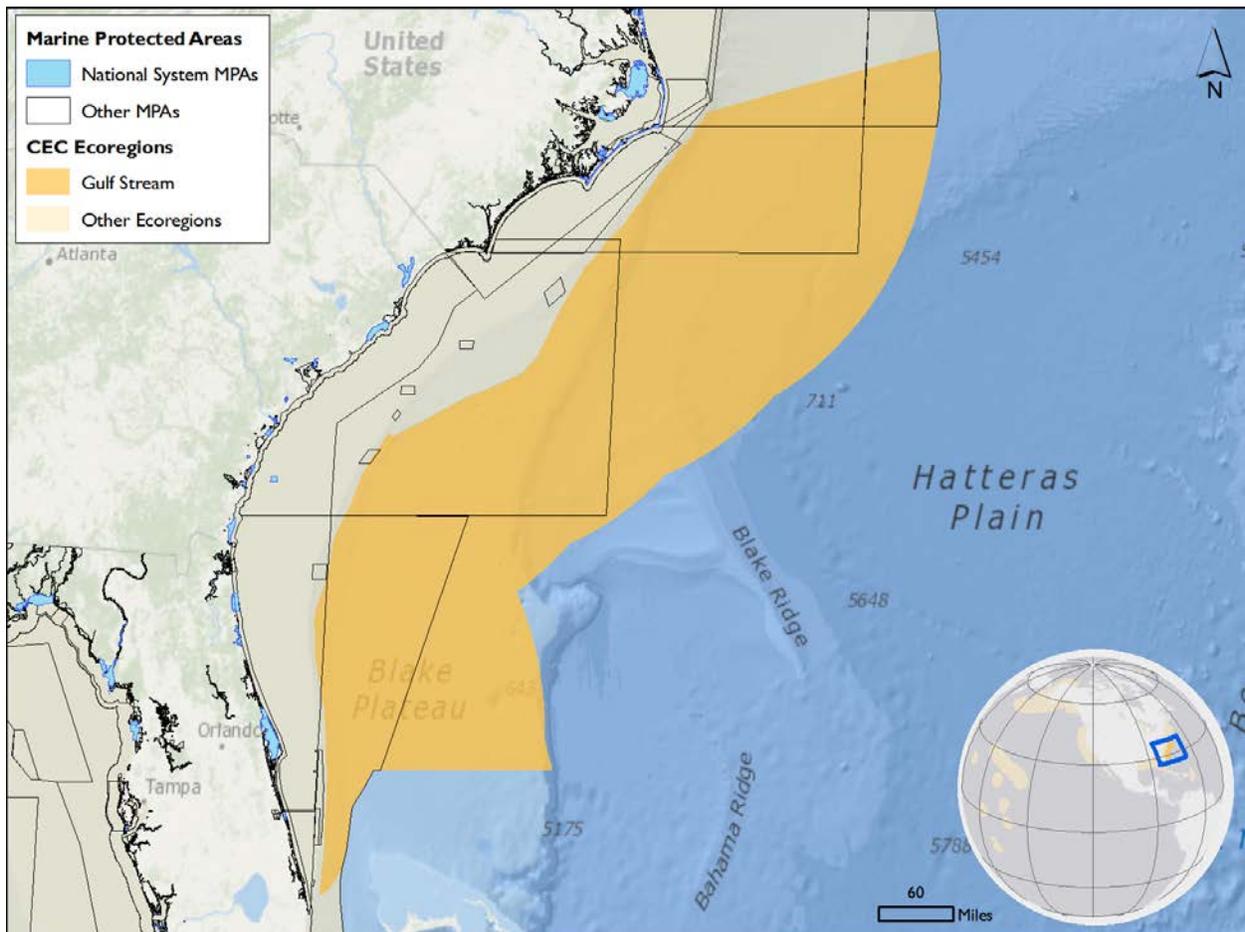


Gulf Stream (Ecoregion 10)

Background

The Gulf Stream does not come into contact with any land although the ecoregion does come close to shore off the central coast of Florida. The ecoregion is dominated by the Gulf Stream current – an underwater “river” emanating from the Straits of Florida to the south and flowing northward until it begins to veer northeasterly off the coast of the Outer Banks and Cape Hatteras, North Carolina. The southern portion of the ecoregion consists of a relatively shallow drop-off from the continental shelf. The northern portion of the ecoregion off Virginia and North Carolina has a much steeper drop-off from the wide continental shelf down to the deep abyssal plain. Eddies often spin off the western boundary of the Gulf Stream and warm core rings transport semi-tropical species into colder areas where they would normally not be expected to be found. These oceanographic features have a significant influence of the productivity of the ecoregion.



MPAs in the Gulf Stream

There are eight MPAs in the Gulf Stream Ecoregion. Of the ecoregion’s eight MPAs, none are National System members and all eight are eligible to become but are not currently National System members (Figure 1). All eight of the MPAs in the ecoregion are managed by the NOAA

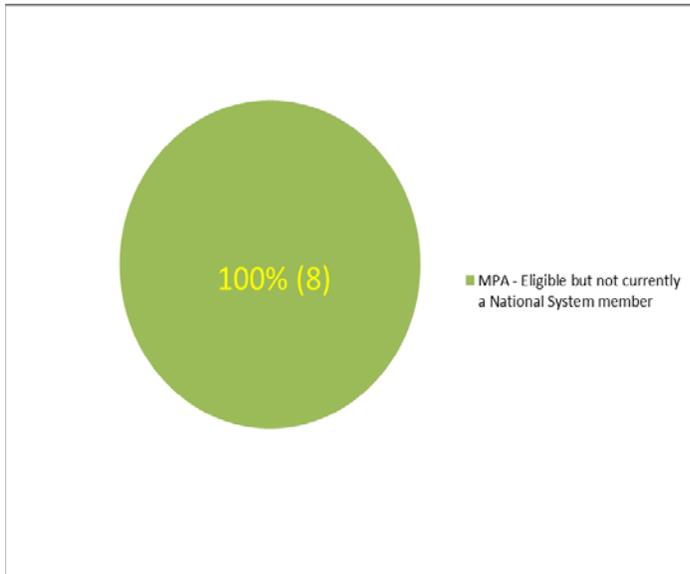


Figure 1. Percent of Marine Protected Areas (MPAs) within the Gulf Stream (Ecoregion 10) that are members of the National System of MPAs (n=8)

Fisheries Service and are closed to fishing gear that can potentially indiscriminately catch non-target species such as in the case of the longline fishery. The non-national system MPAs are primarily focused on alleviating impacts on select species of fish and all sea turtles. For instance, some closures are seasonal (January – April) as in the case of the Charleston Bump MPA and some are year-round as is the case of the East Florida Closed Area MPA. Some of the MPAs aim to protect the snapper-grouper complex while other MPAs attempt to protect

deepwater wreckfish. All MPAs attempt to alleviate the threats that longline fishing may have in these MPAs. Several expeditions to these offshore underwater areas led by NOAA’s Office of Exploration and Research have found an extensive system of coldwater corals in half of the eight ecoregion MPAs (Figure 2). Seamounts are found in the Charleston Bump and East Florida Coast Closed Area MPAs. The interaction of Gulf Stream water along the continental shelf with these underwater geologic features causes upwelling to occur, contributing to a highly productive offshore ecosystem to be found.

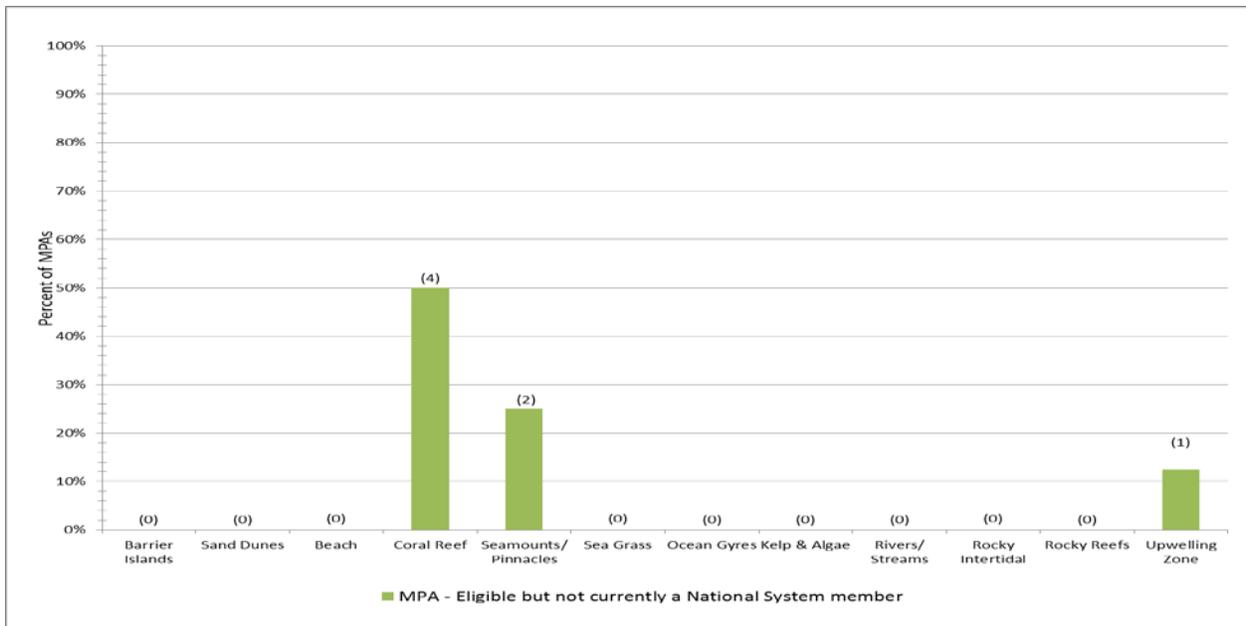


Figure 2. Percent of MPAs that contain certain habitat groups in the Gulf Stream (Ecoregion 10)

Because of upwelling and the spinoff of eddies from the Gulf Stream, a number of commercially and recreationally important fisheries can be found in the ecoregion. Important highly migratory species (e.g., found in 75% of the MPAs) such as Bluefin tuna, sailfish and white marlin are abundant in the ecoregion (Figure 3). The ecoregion also supports internationally significant marine mammals, including cetaceans (e.g., found in 62%) such as North Atlantic Right and sperm whales that favor deep productive waters. Anadromous and estuarine/ coastal fish migrate offshore from the east coast’s rivers and streams during part of their life cycle, reported in approximately 12% and 50%, respectively, of the ecoregion’s MPAs. Various types of marine fishes are found throughout many of the ecoregion’s 8 MPAs, including coastal pelagic in 88%, reef fish associated with coldwater corals (62%), and commercially important groundfish (88%). Deepwater species such as tilefish are reported in 75% of the ecoregion’s MPAs. Temperate marine mammals take advantage of the ecoregion’s mixing of warm water from the south and cold temperate water from the north, including pinnipeds (12%) found along the mid-Atlantic, an important predator as well as prey species. Sirenia are reported in the Southeast U.S. Restricted Area MPA, an area closed primarily to gillnetting to reduce bycatch of non-target species.

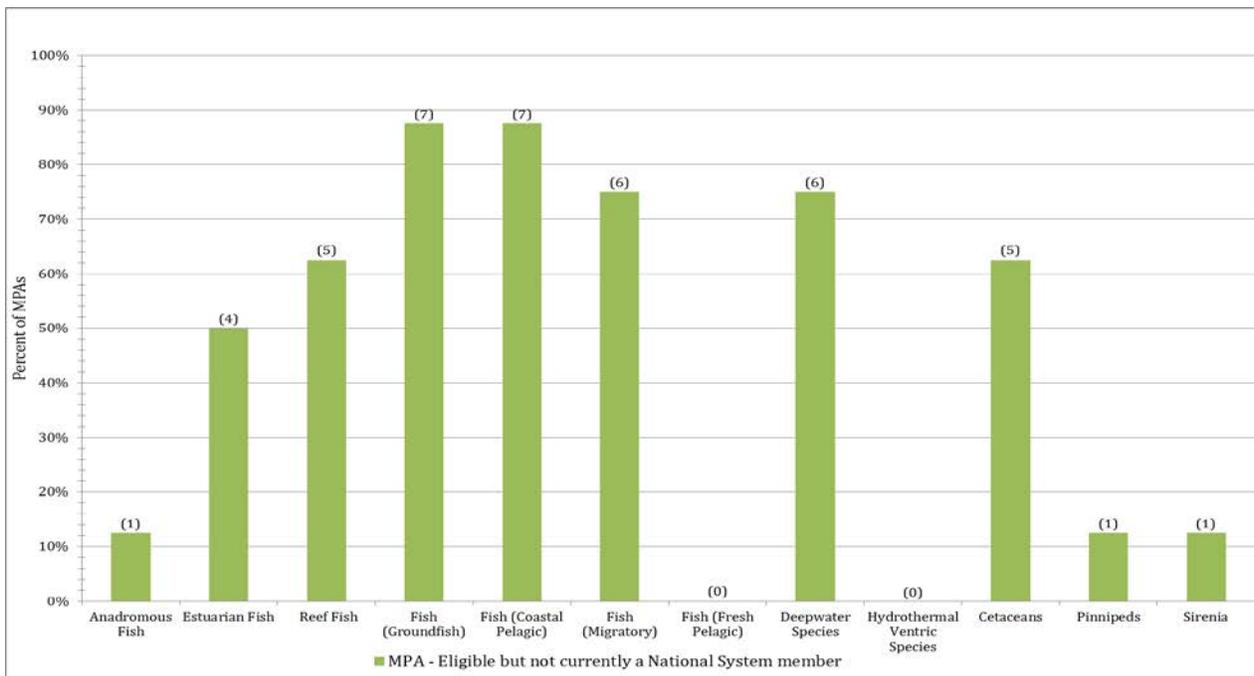


Figure 3. Percent of MPAs that contain certain fish and marine mammal groups in the Gulf Stream (Ecoregion 10)

Birds are classified as waterfowl, estuarine or seabirds, signifying where their principle feeding areas occur, and are found in several of the ecoregion’s eight offshore MPAs, 38%, 38%, and 62%, respectively (Figure 4). Birds not classified in any of these feeding guilds are found in 38% of the ecoregion’s eight MPAs.

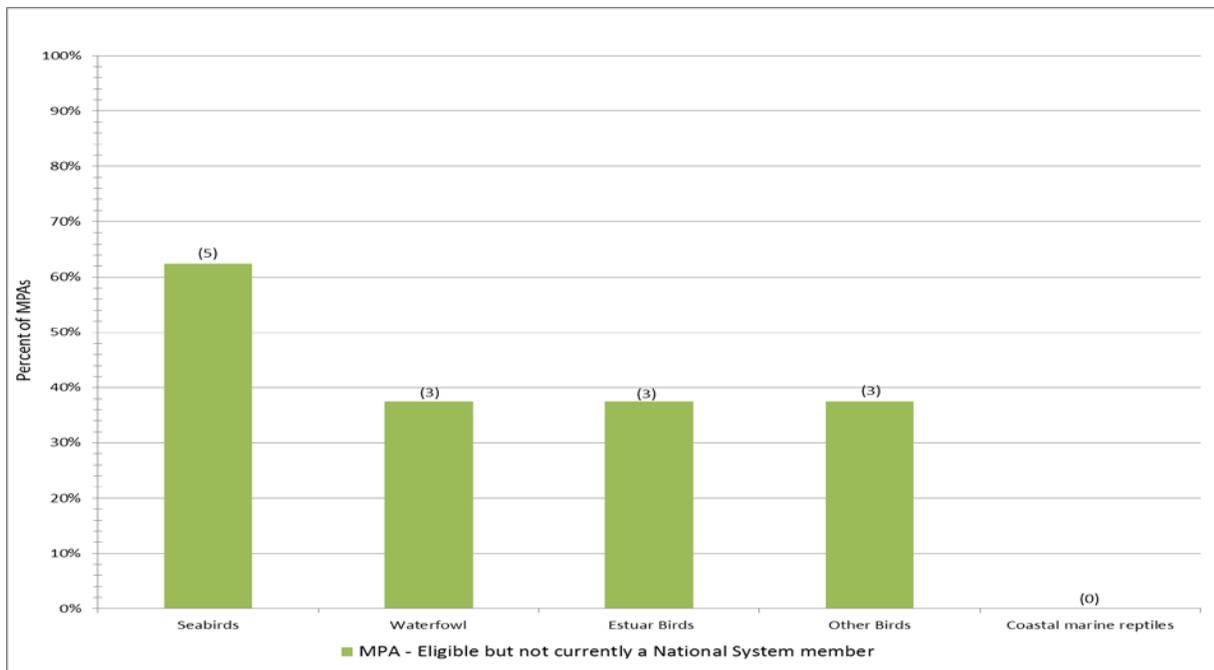


Figure 4. Percent of MPAs that contain marine birds and reptiles in the Gulf Stream (Ecoregion 10)

As the ecoregion is offshore, there are no reports of intertidal species being found within any of the eight MPAs (Figure 5). Subtidal invertebrates such as mollusks (e.g., oysters) and crustaceans (e.g., deep-water crabs and shrimp) are found in 75% of the ecoregion’s MPAs and are important prey species for many of fish.

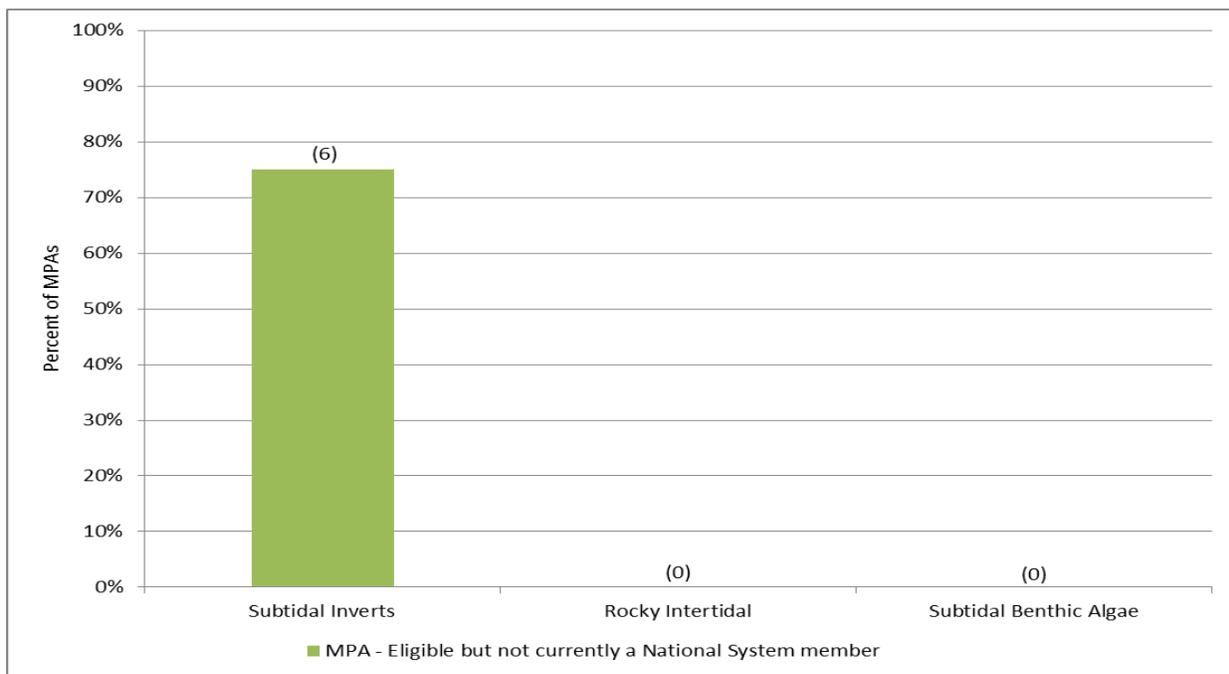


Figure 5. Percent of MPAs that contain Invertebrates and Algae in the Gulf Stream (Ecoregion 10)

Ecologically important areas that support where species breed/nest/spawn/rest can be found in some of the offshore ecoregion’s MPAs. This ecoregion has several endangered and threatened species present (e.g., found in 38% of the MPAs), including sperm, fin, humpback and North Atlantic Right Whales as well as leatherback sea turtles (Figure 6). The Charleston Bump MPA in the ecoregion is the only known documented spawning area for the wreckfish in North America.

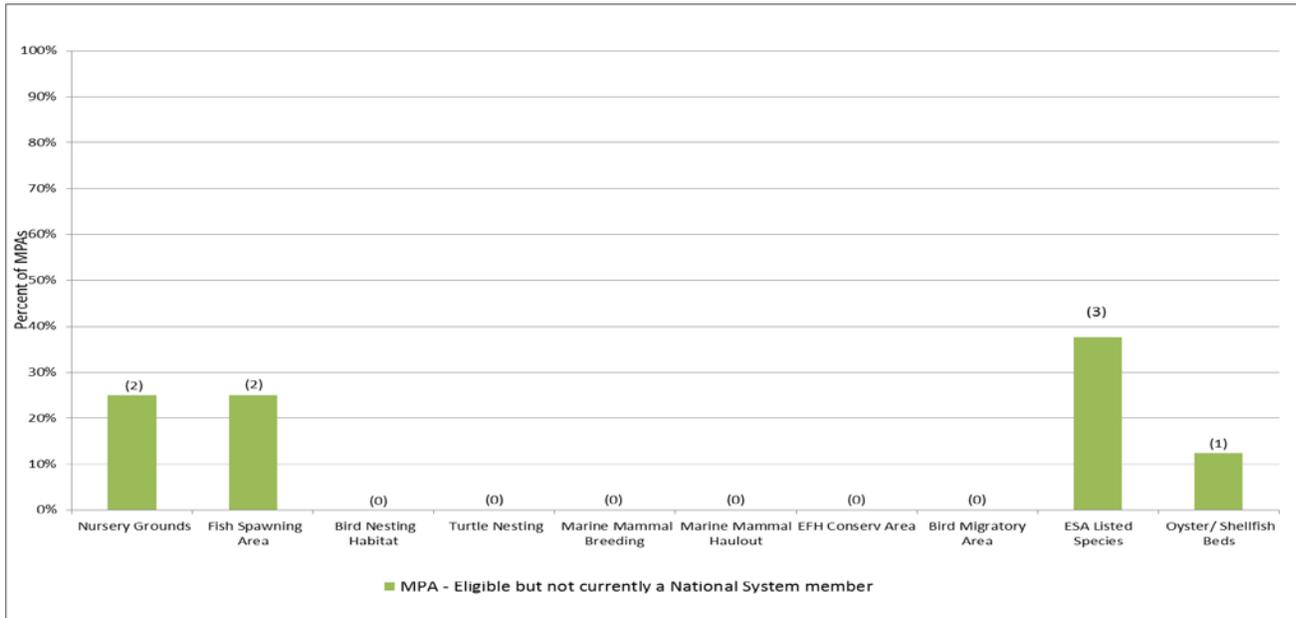


Figure 6. Percent of MPAs with ecologically important areas in the Gulf Stream (Ecoregion 10)

Conclusions

The eight MPAs in this ecoregion contain the major habitat (e.g., seamounts and coldwater corals) and species groups (e.g., fish, marine mammals, birds) that can be expected in an offshore region and ecologically important areas (e.g., fish spawning and nursery grounds) found in the ecoregion as a whole. Where present, these resources are also frequently found in more than one MPA, resulting in some replication of ecological features (species, habitats and ecological processes) -- one of the criteria identified by the Convention on Biological Diversity (CBD) in designing effective MPA networks.

Suggested Reading

Valentine, C., J.R. Uzzmann and R.A. Cooper. 1980. Geology and biology of Oceanographer submarine Canyon. *Marine Geology* 38:(4):283-312