

The Banks: A Regional Context

The Flower Garden and Stetson Banks are only three among dozens of banks scattered throughout the northern Gulf of Mexico, along the continental shelf. All of these banks are part of a regional ecosystem, heavily influenced by current patterns within the Gulf. Inflows from the large watershed that drains two-thirds of the continental United States also play a significant role in the health of this region.

Currents

From the south, the Gulf of Mexico is fed by a current of warm water from the Caribbean, which enters the Gulf between Mexico's Yucatan Peninsula and Cuba. The deeper water flows up the middle of the sea, forming the Gulf Loop Current, which curves east and south along Florida's coast and exits through the Straits of Florida.

The Gulf Loop is variable, sometimes barely entering the Gulf before turning, while at other times, it travels almost to Louisiana's coast before swinging toward Florida. When that happens, the main current passes directly over the eastern banks along the continental shelf. Simultaneously, bits of the loop often break away from the main current and form circular eddies that move westward, across the Flower Garden, Stetson and other banks to the west. This influx of water brings with it animal larvae, plant spores and other imports from the south; it accounts for the many Caribbean species found in the northern Gulf of Mexico. During its progress, the main current is also picking up the same sorts of 'passengers' from the northern Gulf to deliver along its route back to the Caribbean and Atlantic.

Meanwhile, the shallower parts of the water flowing into the Gulf travel northwestward following the Mexico and Texas coastlines before turning east. These wind driven currents also cross over the Flower Garden, Stetson and other banks from the opposite direction of the Gulf Loop eddies and add to the Caribbean influence in the region.

Added to this mix of influences are the hundreds of oil and gas production platforms that serve as de facto artificial reefs by providing a hard surface to which larvae and spores may attach themselves. Scientists are still assessing the extent to which this system of platforms affects the overall biological productivity of the Gulf.

Watershed

From the north, the Gulf of Mexico is fed by multiple rivers that drain the interior of North America. The most significant of these is the Mississippi River Basin. These rivers bring with them all of the runoff accumulated from cities, suburbs, rural areas and wildlands along their routes. Before it reaches the Gulf, this replenishing source of water is partially depleted by extractions for municipal, industrial and agricultural consumption, thus reducing freshwater inflows that sustain the estuaries. When healthy, the estuaries filter sediments and pollutants from the water, export organic material for the food chain in nearshore areas, and provide nursery areas for many species, some of which later move offshore to the system of banks along the continental shelf.

Connectivity

We have long been aware that water flows connect the dozens of banks along the continental shelf. Recent explorations, however, indicate that there may be much more physical connection than previously believed. Technological advances have allowed higher resolution mapping efforts that reveal systems of low relief geological features (such as rock outcroppings) between those banks that have been more extensively explored in the last few years. Such areas may allow much more direct interaction between the banks than previously thought. As we build upon the knowledge base established by the discoveries to date, we may discover that these interactions play a crucial role in maintaining the health of the sanctuary's living marine resources.