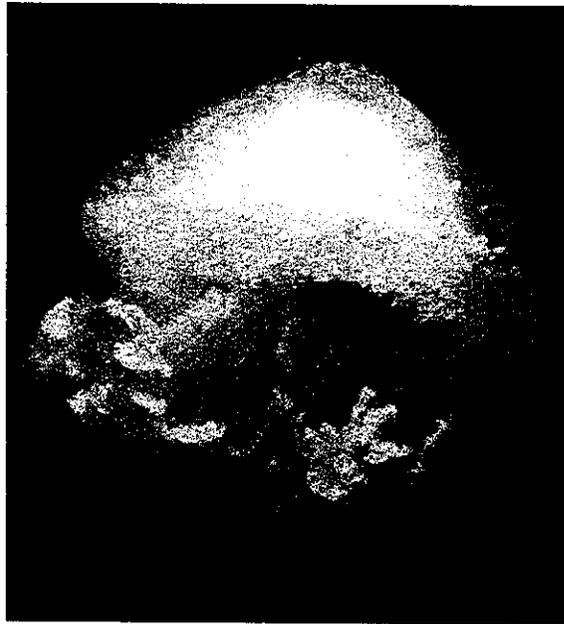


# Spotted Jellyfish

## Alien Invader

### INVADING THE GULF

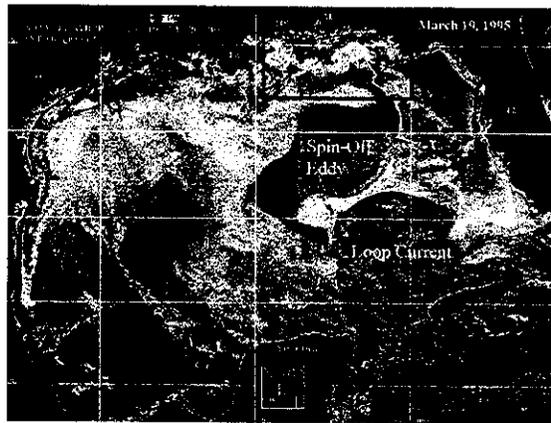
The spotted jellyfish, *Phyllorhiza punctata*, is an invasive, exotic species that has taken up residence in coastal waters of the northern Gulf of Mexico. Native to the Indo-Pacific (probably western Australia), it was introduced to the western tropical Atlantic in the late 1960s or early 1970s. This introduction was probably from the attachment of the sessile (non-mobile) polyp stage of this species to the hulls of ships passing through the Panama Canal. Until recently, the distribution of the jellyfish in the western Atlantic was localized in the southern Caribbean with some extension to the north in the waters around Puerto Rico.



1. The spotted jellyfish, *Phyllorhiza punctata*. Photo by Darryl Felder.

In the spring and summer of 2000, thousands of spotted jellyfish invaded the coastal waters of Alabama and Mississippi. Transport to the northern Gulf may have occurred by means of a current that enters

the Gulf of Mexico through the Yucatan Straits. This water mass, known as the Loop Current, brings warm, salty water from the Caribbean into the Gulf of Mexico. Occasionally, the current penetrates far into the Gulf of Mexico before exiting through the Florida Straits. When this occurs, an eddy may form, break from the current, and move northward. Organisms that are captured in the eddy are transported with the current and distributed to other areas. If environmental conditions are favorable for survival of the captured organisms, they may either temporarily, or permanently, expand their territorial range.



2. Satellite imagery of the Loop Current and a spin-off eddy similar to the one that scientists believed brought spotted jellyfish into the northern Gulf of Mexico. Degree of Loop Current penetration and eddy formation is variable from year to year.

In the nutrient-rich coastal waters of the northern Gulf, the spotted jellyfish found an abundant food source and temperatures and salinities that favored survival and rapid growth. Large populations of the jellyfish occurred in waters both north and south of the barrier islands with many individuals over two feet in bell diameter and weighing over 25 pounds.

### VORACIOUS APPETITES

The feeding habits of the jellyfish are cause for concern. Spotted jellyfish are filter feeders and ingest huge amounts of

zooplankton as they swim through the water. They may consume as much as one pound of dry zooplankton per day per jellyfish and can strip the water column of these microscopic organisms. The eggs and early larvae of commercial and recreational fish species as well as the larvae of crabs, shrimp, and oysters are vulnerable to predation by these jellyfish. Since the abundance and distribution of the jellyfish coincides with the spawning location and season for many important fish and shellfish, there is cause for concern. The jellyfish may be feeding directly on the eggs and early larvae of important biological resources. This means that the future harvest of these resources may be affected. Equally important is the fact that both the jellyfish and the fish and shellfish larvae feed on zooplankton, creating direct competition for food. In areas where jellyfish are concentrated, almost all of the smaller zooplankton is consumed.

### ECONOMIC IMPACT

Blooms of jellyfish, regardless of species, can create substantial economic and ecological damage. In addition to consuming the eggs and larvae of important fish and shellfish resources, jellyfish can interfere with trawling activities. High concentrations of jellyfish force fishermen to either cease trawling activities or move to other areas. In regions that depend on tourism, populations of stinging jellyfish can drive swimmers from the water.

### INDICATORS OF ECOSYSTEM CHANGE

Blooms of jellyfish have been implicated in major ecosystem changes in other areas of the world. Jellyfish can survive and even thrive in nutrient-rich, low-oxygen waters where they can graze without competition from other organisms. Increasing numbers of native jellyfish and the success of the spotted jellyfish may indicate a profound change in the ecosystem of the northern Gulf of Mexico.

## JELLYFISH BIOLOGY

Jellyfish belong to a group of animals known as cnidarians. This group includes the hydras, medusae, sea anemones and corals. All cnidarians have a special type of stinging cell (the nematocyst) that functions in prey capture. In some species, these stinging cells can inject a powerful toxin. Although some species have nematocysts that produce painful burning and irritation on contact, the toxic effects of most cnidarians are imperceptible to humans. A few jellyfish produce toxins that can cause death. The spotted jellyfish has a mild sting, similar to that of the "cannonball jelly" that is common in the northern Gulf of Mexico.



3. Dense concentrations of spotted jellyfish over an oyster reef in Mississippi Sound.

Jellyfish have a complex life cycle that involves a non-mobile, sessile stage called a polyp and a free-swimming medusa stage. Adult medusae reproduce sexually and the fertilized eggs develop into larvae known as planulae. The planulae settle on hard substrate and develop into the polyp stage. The polyp can reproduce by budding to form other polyps. It can also divide (strobilate) to form a free-swimming ephyra. The ephyra grows rapidly to an adult jellyfish. The polyp stage can live for several years and can form a dormant cyst under adverse environmental conditions. Adult jellyfish are generally short-lived.

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