

Florida Bay Bottom-dwellers--Worth a Second Look

Did you know that scientists have found 642 different types of small, bottom dwelling animals living on the mud and soft sediments of Florida Bay? These “macrobenthic organisms” play an important role in the marine ecosystem. It is easy to take for granted the abundance of these little creatures, when most of us focus our attention on the brightly colored fish and corals sharing this habitat. Two separate scientific projects are currently underway in the Florida Keys National Marine Sanctuary to document and identify the types and numbers of bottom organisms living in our marine waters.

Macrobenthic organisms are small animals without a backbone which live on or in bottom habitats. They exhibit a variety of body shapes, feeding styles, and reproductive modes, and comprise a critical link in the marine food web. Most of these benthic dwellers are stationary or attached, leading to their inability to move away from natural and human-caused environmental stresses such as temperature and salinity changes, pollution, and nutrient loading. Therefore, knowing the distribution and abundance of macrobenthic animals may indicate to scientists the relative health of an area. These organisms may also attest to the success of certain management actions if their populations change inside the Sanctuary’s no-take areas, for example.

A project under the direction of Dr. Bernie Gottholm, of NOAA’s Office of Ocean Resources Conservation and Assessment, has been conducting surveys in Florida Bay and the Florida Keys for five years to gather baseline data on macrobenthic organisms. This information will allow scientists to detect changes in populations over time and space, and differentiate if these changes have natural versus human causes.

Dr. Gottholm’s project, called Macrobenthic Community Assessment, includes sediment sampling in four major areas: Florida Bay, Western Florida Bay and Gulf of Mexico, Western Sanctuary and Dry Tortugas, and the Florida Keys Reef Tract. In each of these major areas there are up to 36 individual stations which provide data from a large geographic area.

To collect the three samples needed from each station, a Van Veen grab is used. This instrument is lowered over the side of a boat and scoops up sediment when its two heavy steel jaws close upon impact with the bottom. A diligent assistant (usually Dr. Gottholm’s son, Bernie Jr.) sifts each sample

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Florida Bay has many banks, shallow basins, and mangrove islands. Most of the Bay bottom is covered with sandy or muddy areas or dense to sparse seagrass communities. (Photo: Heather Dine)

through a sieve while making notes on its composition, color, and odor. The time, water depth, sample size, latitude and longitude are also recorded. Samples are then preserved and stained, in preparation for shipping to a laboratory where several biological factors are analyzed. One final “grab” is taken to determine sediment type (described as percent sand, gravel, silt, and clay), grain size, and total organic carbon content. Before heading to the next station, water quality parameters such as salinity, temperature, dissolved oxygen, and conductivity are recorded using an automated instrument.

When received back from the laboratory, the raw data from each station is entered into a master database and categorized by area. Browsers can search the database for information specific to a certain geographic area or organism.

The number of macrobenthic organisms recorded from Dr. Gottholm’s 1996 data are impressive, to say the least. A total of 20,741 animals were found in the Florida Bay location, representing 642 different groups or species. Most of these animals (49.1%) were worms from the phylum Annelida, followed by crustaceans and molluscs. The Western Florida Bay and Gulf sediments were even more abundant with marine life, revealing 989 different types of organisms and a total of 43,964 individuals.

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After transforming from their planktonic or floating stage of development, young queen conch are quite small when they first settle to the bottom. Mollusks are a very diverse and important group of animals in Florida Bay and the Florida Keys National Marine Sanctuary. (Photo: Florida Marine Research Institute)

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These huge numbers may be difficult to grasp, given the number of stations and samples taken. But one figure stands out for sure, which is mean density, or how many organisms on average are living in a square meter of bottom. In Florida Bay this number was as high as 16,392 organisms, and Station #44 in the Western Bay and Gulf area reported an average of 30,633 organisms per square meter of sediment!

Another scientific study will be attempting to identify, classify, and count the total number of mollusc species occurring in the Florida Keys National Marine Sanctuary. Molluscs originated 500 million years ago and over time have developed highly varied body forms. Florida Keys' molluscs include gastropods such as conch and flamingo tongues, fileclams and oysters, and the complex squid and octopus. Naturalists from the American Museum of Natural History and the Field Museum of Natural History will compliment existing statistics such as Dr. Gottholm's with field sampling throughout the Keys to establish baseline data on this particular group of animals. Molluscs are the second

most diverse group of animals on earth, and a current estimate of the total number living in the Florida Keys' habitats is 1322 species! This number is expected to increase after detailed sampling efforts are completed.

The information gathered from each of these projects will greatly increase our knowledge of the diversity, abundance, and importance of bottom-dwelling invertebrates in the Sanctuary. And, the possibility of identifying an unknown species living in the Florida Keys is truly exciting. So the next time you find yourself underwater, perhaps you'll decide that the ocean floor deserves a second look.

*Note: This article appeared in the Fall 1998 issue of the newsletter of the Florida Keys National Marine Sanctuary, **Sounding Line**. For more information, visit: floridakeys.noaa.gov.*