

THE SANCTUARY SAMARITAN



Trichodesmium, an important nitrogen-fixing bacterium, is commonly called sea saw-dust because its colonies and large brown blooms have been mistaken as sandbars by ships in the ocean (including Captain Cook who wrote that first documentation of *Trichodesmium* over 200 years ago). This photosynthetic cyanobacteria can be found as filaments (trichoma) comprised of 10's-100's of cells or in colonies 1-10 mm in length made up of about 50-200 filaments. The fact that these colonies can be seen by the naked eye is what gave *Trichodesmium* its name – the Greek word "trichoma" for hair and "desmus" for bonded= "bonded hair", which is what *Trichodesmium* colonies might look like to be to the human eye. They occur during periods of low wind stress and warm temperatures. Some of these blooms are so vast that they are visible from space.

This photo was taken by the U.S. Coast Guard on May 31st just north of Gray's Reef National Marine Sanctuary. Though this particular bloom is harmless, it is a good practice to send these types of pictures to us whenever you see a bloom like this occur. Harmful Algal Blooms (HABs) are rare in our area but have come as close as Jacksonville in the recent past. This bloom of phytoplankton (micro algae) is known as *Trichodesmium*. This type of bloom is very common though this is much earlier than is typical for our area.

Phytoplankton, or algae, are normal components of all aquatic environments, creating the base of both marine and freshwater food webs. When phytoplankton bloom in significant numbers (approximately 1 million cells per liter of seawater equals a "bloom") and produce biotoxins, these events are termed harmful algal blooms or HABs. HABs represent a present and growing threat to virtually all U.S. coastal waters, where their impacts range from devastating economic effects to public health risks to ecosystem alterations. Often referred to collectively as "red tides," HABs are most often of concern because of the extremely potent toxins they produce. When HAB toxins accumulate in marine animals they lead to closures of commercial and recreational fisheries, mass mortalities of birds, fish, and marine mammals, and human illness or death in extreme cases.

Volunteers are needed at Gray's Reef monitoring sites weekly to conduct 'citizen science' aboard our vessels within the Sanctuary and inshore dock by sampling water, observing atmospheric conditions and identifying species of phytoplankton found in our marine environment. In 2001, the [NOAA Phytoplankton Monitoring Network](#) began with 3 volunteer groups in Charleston, SC and has since expanded throughout the coastal United States to now include more than 200 volunteers sampling over 140 sites in 17 states and the US Virgin Islands. Volunteers range in age and background from elementary school students to retired scientists and represent a wide diversity of organizations. Citizen Science is a way for you to connect with the natural world through fun activities that generate vital information for the conservation of our ocean, and special marine protected areas like Sanctuaries.

[Adopt-A-Stream](#) is the land-based water quality testing program for GA DNR Environmental Protection Division. It hopes to increase public awareness of the state's nonpoint source pollution and water quality issues, provide citizens with the tools and training to protect their local waterways, and collect baseline water quality data.

During the [2011 NOAA R/V Nancy Foster cruise](#), Drs. Risa Cohen and Daniel Gleason from the Department of Biology at Georgia Southern University continued studies investigating the extent to which the Altamaha River delivers dissolved substances to Gray's Reef National Marine Sanctuary (GRNMS).

This study addresses an important gap in our understanding of the role that rivers play in the health of offshore marine ecosystems. Specifically, a wealth of data has shown that urbanized watersheds deliver pollutants such as pesticides, mercury, and excess nitrogen that result from human activities to the coast, but the majority of these studies have focused on impacts to estuarine and near-shore systems.

The Adopt-A-Stream program is based on the manual *Getting To Know Your Watershed*. Volunteers learn how to register the stream, wetland or lake that they will monitor. Then volunteers learn how to use maps to delineate and assess their watershed. Land use and impervious surface is discussed as it pertains to the watershed survey data forms as well as conducting a visual survey and learning how to do a stream cross-section and calculate flow. The Chemical Monitoring workshop is designed to teach volunteers about basic stream water chemistry and how to conduct chemical tests using hand-held field equipment. The basic tests include dissolved oxygen, conductivity, pH, and temperature. Advanced tests may include alkalinity, phosphate, and nitrate-nitrogen.

Gray's Reef is looking for citizen scientist to aid in our research initiatives and help support the health of this offshore ecosystem and coastal marine environments. You can register your interest with our volunteer coordinator [Jody Patterson](#) at (912) 598-2431.