THE SEAGRASSES OF CHARLOTTE HARBOR

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Seagrasses are flowering plants that grow underwater in marine and estuarine environments. In addition to flowers and their seeds, seagrasses, like plants on land, have roots and leaves that do different "jobs" for the plant... that is, the roots access nutrients buried in the sediment, while the leaves photosynthesize (convert sunlight to energy). Having roots, leaves, flowers, and seeds makes seagrasses (and their freshwater cousins) different from algae.

Light is an important factor effecting the distribution and abundance of seagrasses. In the same way that smog or clouds affect the amount of light available for plants on land, colored or cloudy water can limit the amount of light available to seagrasses. Water green with phytoplankton (free-floating, microscopic algae) can also reduce light that reaches the bottom, reducing water clarity and compromising seagrass photosynthesis.

Seagrasses -- as well as fish, crabs, and nearly all other organisms that live in estuaries -- are also affected by salinity. In Charlotte Harbor, one seagrass species is found only near Boca Grande Pass, where salinity is high. On the other hand, another species of seagrass is more tolerant of freshwater, and frequent changes in salinity.

Water clarity and salinity are naturally variable in all estuaries around the world, including Charlotte Harbor. These variable conditions are often magnified in un-natural ways, ultimately impacting seagrasses. So how can we tell if our seagrass resources are changing?

Seagrasses in Charlotte Harbor are monitored in two ways. Since 1982, SWFWMD has conducted aerial surveys to determine seagrass acreage within Charlotte Harbor. This is accomplished by taking photographs from an airplane flying at a known elevation, and then identifying regions of seagrass coverage in each image. In this way, researchers can estimate seagrass

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resources across a very large area in a short amount of time. The conclusion of this ongoing program is that the distribution of seagrasses across Charlotte Harbor seems to be stable, if not declining at a slow rate. However, while maps from aerial photographs may be describing the locations where seagrasses are growing, they are less accurate at describing how much seagrass is growing at a particular location.

In contrast a monitoring program conducted by the Charlotte Harbor Aquatic Preserves (CHAP) describes both where seagrasses grow, and how much seagrass is there. Twenty-six permanent underwater transects have been monitored annually in upper Charlotte Harbor since 1999. Think of a transect as a road with between five and fifteen locations spaced along its length. Each year, staff from the CHAP return to these precise locations – several hundred throughout Charlotte Harbor, Gasparilla Sound, Lemon Bay, and elsewhere -- by getting in the water, with dive masks near the bottom, to estimate how much seagrass is present.

An analysis of the transect data recently completed by the Charlotte Harbor Environmental Center (CHEC), CHAP, and SWFWMD indicated a significant decrease (Used this way, "significant decrease" means saying, with confidence, seagrass resources are declining at these precise locations) in seagrass abundance (amount of seagrass at locations along each transect) as well as a decrease in seagrass distribution (seagrass found in fewer places) along many of the transects in the study area.

This is in contrast to the conclusion reached when analyzing maps alone; that seagrass resources seem fairly stable. Of course, in a variable environment such as our estuary, it is important to consider the impacts of water clarity and salinity on seagrasses. Hence, the same transect analysis report, included the suggestion that seagrasses in Charlotte Harbor are affected by water clarity, salinity, and nitrogen, components of water quality which the Charlotte Harbor National Estuary Program has identified may be changing for the worse.

The purpose of long-term resource monitoring programs such as the two described is to detect changes in the environment. Once detected, research into the causes of the change must be conducted, so that solutions may be identified. Being able to analyze both seagrass datasets together will be an important step in this process. Analysis of the CHAP transect data has showed us where seagrasses are stable, and where they are in decline. When combined with maps that suggest stable or possible decline in seagrasses, we can say with more confidence where, and by how much, our seagrasses are changing across the region.

Source: Seagrass Transect Data Summary and Analysis From a Six Year Period: 1999-2004, CHEC (May 2006), and Jason Hale, CHEC

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