The Effects of Boat Traffic on Water Quality as Measured by Levels of Turbidity, Colored Dissolved Organic Matter, and Chlorophyll A

Marchese, Melissa

The purpose of this experiment determines how bay and estuary water quality is affected by high volumes of boat traffic. A large presence of boats in waterways has been found to disturb water and resuspend sediment and organic matter on the seafloor, causing greater light attenuation. Resulting decreased water clarity inhibits seagrass growth by decreasing available light, increasing temperatures and decreasing dissolved oxygen levels, adversely impacting the ecosystem. For this among other reasons, seagrass trends have been declining in Florida. Water clarity effects can be quantified by measuring turbidity, colored dissolved organic matter (CDOM), and chlorophyll a. These levels were observed in waterways containing seagrass beds with 25 mph speed limits and sufficient boat wakes generated. Samples were collected during times of heavy boat traffic and compared to times with lighter levels of boat traffic. Wind and tide were accounted for as additional environmental variables. The results supported the hypothesis as high turbidity levels were observed to be correlated with substantial boat traffic. However, CDOM and chlorophyll fluctuations had little to no correlation with increased numbers of boaters or with turbidity. This can be attributed to greater influencing factors such as runoff, rainfall, erosion and point source pollution. Turbidity levels likely increased as the number of boats did because the suspended particles deflecting light were mostly inorganic sediment. It can be concluded that reducing boating impact via decreased traffic or lower speed limits and smaller wakes near beds would create more favorable growing conditions for struggling seagrass populations.

Awards Won: