LAKE OKEECHOBEE SUBMERGED VEGETATION EFFECT OF LIGHT RESEARCH PROJECT

Mandate:

Comprehensive Everglades Restoration Plan (CERP)
Lake Okeechobee Watershed Protection Program (LOWPP)

Background:

Submerged aquatic vegetation (SAV) has multiple functions in the Lake. It stabilizes sediments, sequesters nutrients, and provides habitat for fish and wildlife. It is a keystone ecosystem component, and has been selected as one of the priority performance measures for reporting yearly ecosystem status under CERP to the US Congress. The extent of SAV in Lake Okeechobee varies directly with water clarity and near-sediment light levels, and inversely with water depth. Because SAV responds to water clarity, which is affected in part by the amount of nutrients / algae present in the water, it also is an important performance measure for evaluating the success of nutrient reduction efforts in the Lake Okeechobee Watershed Protection Program.

Project Overview:

Experiments have been conducted with Vallisneria americana (eelgrass) and Chara zeylanica (shrimpgrass), and will be conducted with Potamogeton illinoensis (peppergrass), to determine the amount of light that results in no net growth. Each experiment uses a random design, with four light treatments and six replicates per treatment, and is conducted in a large outdoor tank, with sediment, water, and plants from Lake Okeechobee. Plants are grown in plastic tubs on the tank bottom under different light levels, are harvested after two to four months (depending on their rate of growth), and biomass is determined. These results are analyzed to determine no-net-growth light levels for each species.

Application of Results:

These results have already been used to establish an initial restoration goal for the minimum amount of near-sediment light that is needed to insure healthy Vallisneria populations. The no-net-growth light levels can also be used to guide management of lake water levels under the WSE regulation schedule, and to calibrate a SAV model under development for application in CERP Adaptive Assessment.