



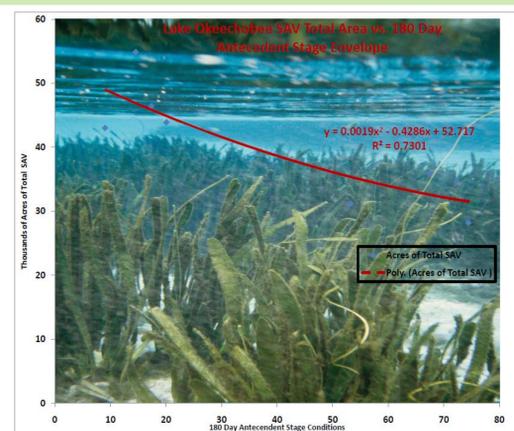
The Effects of CERP upon Submerged Aquatic Communities in Lake Okeechobee

Authors: Ed Brown, Kelly Keefe, Kang Ren Jin, Melissa Reynolds, and Chris Strandes – RECOVER

The submerged aquatic vegetation (SAV) in Lake Okeechobee provides critical habitat for fish and wildlife, stabilizes shoreline sediments, and supports periphytic algae that sequesters phosphorus in inorganic forms which serves to remove phosphorus from the water. The spatial extent of SAV varies in response to changing water level. (Schwarz et al., 2002; and Havens, 2003) have documented that prolonged deep flooding can affect SAV due to light limitation, similarly (Havens et al., 2001) (Scheffer et al., 1994; Jeppesen et al., 1998; Blindow et al., 2002) have documented loss of SAV increases shoreline wave energy which creates changes in water quality, turbidity and ultimately noxious algal blooms. When these turbid conditions have occurred, subjecting the littoral zone to periods of extreme low water may be the only method of obtaining sufficient irradiance for net growth of SAV. (Scheffer, 1998). Creating these low water conditions may be required for the germination of shoreline emergent vegetation (Cronk & Fennessy, 2001).

The stage envelope was the basis for the Restoration Coordination Verification (RECOVER) system wide performance measure Stage envelope. This is indicated in the figure below. Depths are described on the ordinate axis, months are depicted on the abscissa axis. The shaded area of the graphic (O) boxes indicate optimal monthly stages. Deviations from this stage are measured in terms of foot months or weeks. This system permits quantification (in hydrologic units) of deviation from optimal ecologic conditions.

Stage	J	F	M	A	M	J	J	A	S	O	N	D
19	3.5	4	4.5	5	6	6.5	6.5	6	5	4	3.5	3.5
18.5	3	3.5	4	4.5	5.5	6	6	5.5	4.5	3.5	3	3
18	2.5	3	3.5	4	5	5.5	5.5	5	4	3	2.5	2.5
17.5	2	2.5	3	3.5	4.5	5	5	4.5	3.5	2.5	2	2
17	1.5	2	2.5	3	4	4.5	4.5	4	3	2	1.5	1.5
16.5	1	1.5	2	2.5	3.5	4	4	3.5	2.5	1.5	1	1
16	0.5	1	1.5	2	3	3.5	3.5	3	2	1	0.5	0.5
15.5	0	0.5	1	1.5	2.5	3	3	2.5	1.5	0.5	0	0
15	0	0	0.5	1	2	2.5	2.5	2	1	0	0	0
14.5	0	0	0	0.5	1.5	2	2	1.5	0.5	0	0	0
14	0.5	0	0	0	1	1.5	1.5	1	0	0	0.5	0.5
13.5	1	0.5	0	0	0.5	1	2	0.5	0	0	1	1
13	1.5	1	0.5	0	0	0.5	0.5	0	0	0.5	1.5	1.5
12.5	2	1.5	1	0.5	0	0	0	0	0	1	2	2
12	2.5	2	1.5	1	0	0	0	0.5	1.5	2.5	2.5	2.5
11.5	3	2.5	2	1.5	0.5	0.5	0.5	1	2	3	3	3
11	3.5	3	2.5	2	1	1	1	1.5	2.5	3.5	3.5	3.5
10.5	4	3.5	3	2.5	1.5	1.5	1.5	2	3	4	4	4
10	4.5	4	3.5	3	2	2	2	2.5	3.5	4.5	4.5	4.5
9.5	5	4.5	4	3.5	2.5	2.5	2.5	3	4	5	5	5
9	5.5	5	4.5	4	3	3	3	3.5	4.5	5.5	5.5	5.5
8.5	6	5.5	5	4.5	3.5	3.5	3.5	4	5	6	6	6
8	6.5	6	5.5	5	4	4	4	4.5	5.5	6.5	6.5	6.5
7.5	7	6.5	6	5.5	4.5	4.5	4.5	5	6	7	7	7



Total SAV is measured is measured by SFWMD in August each season. These have been recorded from 2000-2009. A regression was prepared to determine if total area of SAV could be associated with conformance to the stage envelope. A good relationship was determined if 180 day antecedent conditions were used. These are depicted upon the graph above.

REFERENCES

- Havens, Karl, Fox D., Gornack S., Hanlon C. "Aquatic Vegetation and Large Mouth Bass population response to Water Level Variations in Lake Okeechobee Florida (USA). Hydrobiologia 2005 #538: 225-237
- Blindow, L. A. Hargoby & G. Anderson. 2002. Seasonal changes of mechanisms maintaining clear water in a shallow lake with abundant Chara vegetation. Aquatic Botany 72: 315-334.
- Havens, K. E., 2003. Submerged aquatic vegetation correlations with depth and light attenuating materials in a shallow subtropical lake. Hydrobiologia 493: 173-186.
- Jeppesen, E., M. Sondergaard, & K. Christoffersen (eds). 1998. The Structuring Role of Submerged Macrophytes in Lakes. Springer-Verlag, New York, 423 pp.
- Scheffer, M., M. Van den Berg, A. Breukelaar, C. Breukers, H. Coops, R. Doef & M. L. Meijer, 1994. Vegetated areas with clear water in turbid shallow lakes. Aquatic Botany 49: 193-196.
- SFWMD (2006) http://www.sfwmd.gov/org/wrp/wrp_okee/projects/subaquatic.html
- SFWMD (2006 a) http://glades.sfwmd.gov/pls/dbhydro_prtq/show_dbkey_info.main_page_
- SFWMD (2006 b) http://www.sfwmd.gov/org/wrp/wrp_okee/2_wrp_okee_inlake/savmaps.html

