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The Distribution of Macroalgae in Furman Lake

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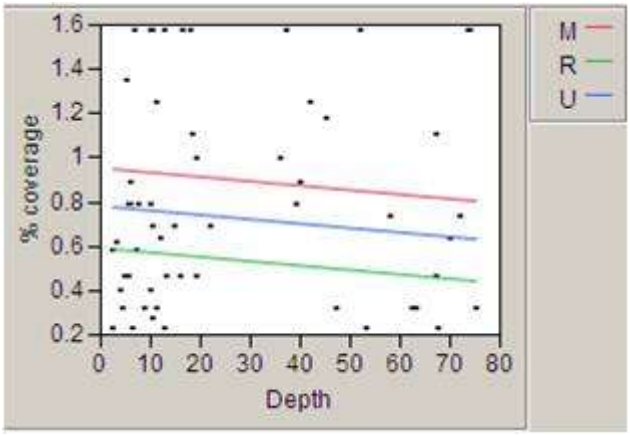
SUMMARY
One of the primary objectives of the Lake Restoration Project is to reduce the amount of macroalgae in the lake. Blooms have been fostered by nutrients in surface run-off, waterfowl waste, and input from denuded feeder creeks. Efforts to reduce the algae include allowing vegetation to regrow naturally on the west shore, and a more complete landscape restoration on the north shore. The restoration includes meadows of native wildflowers to absorb surface run-off, rain gardens to filter excess nutrients from water before it reaches the lake, and biologs to restore the eroded bank and create a zone for semi-aquatic plants. Our goal was to test whether or not these restoration efforts have significantly changed the algae cover in three different zones: mown, regrown (not mown), and restored.
We recorded percent algal cover in a 0.25m2 quadrat, every 20 meters around the lake on April 13, 2010. Water depth, recorded at these points in 2007, were also included in the analysis. Mean percent cover (arcsin-squareroot transformed) in the three habitat types were compared with an ANCOVA (using water depth as a covariate).



Percent algal cover was inversely correlated with water depth (Spearman rank correlation, r = -0.244, n = 101, p = 0.014); algal blooms were larger in shallow water, presumeably because light and temperature were higher. There was a significant difference among habitat types in percent algal cover (transformed data) after this depth effect is taken into account (ANCOVA, F = 22.1, df = 3, 97, p = 0.0001). Mean percent algal cover for mown, regrown, and restored areas were 20.8, 44.7, and 8.5%, respectively. The value for mown areas was nearly what depth alone would predict (only 0.3% lower) but regrown areas were much higher than depth would predict (45.8% higher than predicted values). Restored areas were much lower in algal cover than depth alone would predict (63.2% lower). In the restored area, we also observed less algae growth between the biologs and the bank, and more algae byeond the biolog in the lake. This may be attributed to raingardens emptying the newly nutrient deficient water into the buffer zone between the bank and biologs. The biologs, themselves, may be preventing the mixing of nutrient enriched sediment and water from the center of the lake with shoreline sediment and water.

In conclusion, restored areas show a significantly lower amount of algal growth than other areas, and lower than differences in depth, alone, would predict. In addition, biologs may be accentuating the filtering action by keeping filtered water near shore. Curiously, naturally

revegetated areas had the highest algal growth; perhaps because of natural nutrient loading from the large amount of shoreline biomass decomposing. More results will highlight whether these patterns continue.