MEASURING SUBMERGED AQUATIC VEGETATION MOTION USING DIGITAL VIDEO ANALYSIS

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Submerged aquatic vegetation (SAV) plays an essential role in Florida's aquatic ecosystems. When paired with flowing water, the interactions between SAV and flow impact primary producer community structure in Florida springs. While these interactions have been studied in the laboratory setting, quantitative field observations are limited. Here, methods are developed and implemented to measure the motion of SAV in Florida springs by recording digital video footage underwater, followed by multiple steps of image processing to extract blade displacement and velocity data. Field methodology included deploying submersible cameras in a Florida spring run, measuring a vertical velocity profile, collecting high-frequency velocity data at two points along the vegetation patch, and sampling of vegetation to measure stem density, blade density, and blade length. Results from one sample site are presented here. Blade velocities were successfully extracted from the images using particle image velocimetry (PIV). A periodic, coherent waving motion (called "*monami*") would be expected above a critical velocity threshold, however we did not identify this signal from analysis of these data. Ongoing work will characterize the periodicity and correlation between high-frequency velocity data measured in the SAV patch. The data and methods gathered through this research will then be used as validation for a coupled vegetation-hydrodynamics model focused on the role of flow-vegetation interactions in driving patterns of flow and material transport in rivers and estuaries.

PRESENTER BIO: Rob Taylor is an undergraduate researcher at the University of Florida as a member of the Watershed Ecology Lab led by Dr. David Kaplan. Having grown up in Gainesville and the Florida Keys, he is focused on protecting and understanding Florida's waters and natural ecosystems through quantitative field observations and analyses.