**NASA DEVELOP National Program**

University of Georgia

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**Short Title: Southeastern Ecological Forecasting**

**Updated Abstract**

*Hydrilla verticillata* is an invasive aquatic plant that has become a serious problem in Southeastern United States, especially impacting vegetation and water quality. Traditionally, Hydrillainfestation has been tackled using a combination of field based physical, chemical and biological methods, which are often costly. Rapid and accurate spatio-temporal estimates of Hydrilla density and distribution facilitate better monitoring and management of this invasive plant. NASA Landsat 8 Operational Land Imager (OLI) imagery in combination with *in situ* data were used to map Hydrilla distributions and density in four lakes across Georgia (GA) and Florida (FL). Performances of Visible Resistant Atmospheric Index (VARI) and Green Normalized Difference Vegetation Index (GNDVI) were analyzed in terms of mapping Hydrilla density and distribution, using a combination of statistical techniques, such as coefficient of determination (R2), percent normalized root mean square error (%RMSE), and residual trends. The proposed work is innovative because it will use Landsat 8 OLI data to study the spread of the aquatic invasive plants in GA and FL inland waters. The resulting detection tool for monitoring Hydrilla distribution can be used for water quality restoration decision-making by the project end-users, Georgia Power, J. W. Jones Ecological Research Center, and Henry County Water Authority. This tool will be an efficient alternative to otherwise harmful physical or chemical measures, and facilitate adaptive plant management.

Keywords: Remote Sensing, Landsat 8-OLI, Hydrilla, Aquatic Plants, Invasive Species