

Assessing Florida's large rivers: GIS-based data-mining and the impacts of the Atlantic Multi-decadal Oscillation

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As an outgrowth of our work to establish state-mandated MFL's (minimum flows and levels), we have discovered that standard time-series analysis of the previous two decades of flow do not adequately provide management answers for appropriate flow regimes. There are distinctive flow patterns related to the AMO (Atlantic Multi-decadal Oscillation). These have distinctive impacts upon Northern Flow Pattern rivers, now entering into a dry tri-decade, and Southern Flow Pattern rivers, now entering into a wet tri-decade of rainfall patterns. From our research on the Peace River (SRP), we have found that different fish species dominate community structure in wet versus dry tri-decades. We have been using a GIS-based water flow and quality simulation (SWAT) to understand changes in water quality and quantity based upon changes in land-use over the past 60 years. Although only in the initial phases of work, we hope to use these data to predict changes into the future as well as recreate the water quality, flow patterns, and fish and benthic invertebrate community structures based upon changes in channel geometry, hydrographic patterns, and habitat requirements of resident biota by creating an interface between SWAT and the instream flow model, PHABSIM.

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