



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: FL4341

Title: Flow Duration Curves to Advance Ecologically Sustainable Water Management

Focus Categories: Surface Water, Management and Planning

Keywords: Water Levels, Decision Models, Stochastic Hydrology, Rivers, Eco-Hydrology, Minimum Flows and Levels, Water Quality, Watershed Management

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Federal Funds: \$16,476

Non-Federal Matching Funds: \$37,630

Congressional District: 5th

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Abstract

The establishment of minimum streamflows seeks to protect ecological resources and to provide a measure of the water available for permit withdrawals. Comprehensive ecosystem protection cannot be adequately captured by a single "in-stream flow" requirement value. Rather, the minimum flow must consist of a regime of flows that characterize high to low flows at critical recurrence intervals. A challenge for policy makers is to formulate an accessible withdrawal permitting approach from a sound scientific basis that fosters ecosystem productivity. The proposed research seeks to formalize a framework for water permitting by means of the annualized flow duration curve (AFDC). The AFDC provides a graphical tool to illustrate the quantity and frequency of joint streamflow available in a river basin.

This research will develop a methodology that couples the AFDC's robust statistical interpretation of streamflow with ecological data. The ecological data can be used to identify critical points on the AFDC that serve to guide the timing and magnitude of withdrawals such that minimum flow levels are maintained. The research objectives are: 1) to develop a general methodology that uses the AFDC to characterize the existing stream conditions, to modify the FDC based on ecological criteria, and to simulate flow time series using the modified FDC, 2) to create a decision support software tool for the FDC methodology, and 3) to demonstrate the FDC methodology by applying it to the lower Suwannee River in the northern part of peninsular Florida.