DISPERSION AND DRAG through VEGETATION in the FLORIDA EVERGLADES

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Overview

The South Florida Water Management District (SFWMD) has identified a need for a hydrodynamic model to plan future stages of the Kissimmee River Restoration Project. Because vegetative resistance (drag) must be characterized to develop this model, a field experiment including measurements of stage, velocity profiles, and dye spreading was conducted in the Loxahatchee Impoundment Landscape Assessment (LILA), a field model of the Everglades. The field experiment is illustrated in Figure 1. Dye was released (Fig 2); as it dispersed it flowed through a variety of vegetation natural to the Everglades (Fig 3 and 4). Concentration was measured downstream by seven fluorometers spread across the flow path (Fig 5); concentration was plotted with respect to time (Figure 6) and the observed measurements were normalized (Fig 7) using the Frozen Cloud Approximation (Fischer, 1968). This approximation allows us to derive estimates of longitudinal dispersion ($D_x$) which is used to estimate an appropriate value for drag, $C_d$.