

Puerto Rico Winter Institute

"Water and Environment: from Plants to Landscapes"

January 10-24, 2007

Week 1: Water flux through plants: cellular to whole-plant processes

Elvira Cuevas – Professor, Department of Biology, University of Puerto Rico

N. Michele Holbrook – Charles Bullard Professor of Forestry, Department of Organismic and Evolutionary Biology, Harvard University

Ernesto Medina – Investigador Titular, Instituto Venezolano de Investigaciones Científicas (IVIC) and Adjunct Professor, International Institute of Tropical Forestry (IITF), USDA-Forest Service, Puerto Rico

Maciej A. Zwieniecki – Sargent Fellow, Arnold Arboretum, Harvard University

Plants are the principle biological interface between soil and air and thus play a key role in the hydrologic cycle at a variety of spatial and temporal scales. The goal of this first week of the PRWI is to present a comprehensive overview of physiological phenomena that are responsible for plants' ability to dynamically influence rates of water movement from soil to atmosphere. Topics to be covered include the micro-hydrology of roots, stems and leaves, hydraulic impacts on soil processes and nutrient availability, adaptation to variations in moisture availability, and ecological processes and life history traits that influence overall rates and patterns of water transport. Overall, the emphasis will be physiological, although links to ecosystem level processes and evolutionary innovations relating to plant water use will be discussed.