

The Role of Science in the Management of Pantanal and Everglades National Parks

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Management of Protected Areas

The governments of Brazil and the United States established national systems of protected areas because they are important to our sustainability, quality of life, and societal well-being.

Sustaining wetland ecosystems provides important economic benefits such as improved water quality, fertile soils, pest and disease control, water supply, and flood attenuation.

Pantanal and Everglades National Parks:

- **Were set aside to preserve a portion of a much larger wetland ecosystem.**
- **Have mandates to protect native habitats and species and preserve biodiversity.**
- **Both are impacted, to varying degrees, by expanding urban and agricultural development.**

Management of Protected Areas

Brazil and the United States manage their national parks to conserve these areas for aesthetic, recreational, educational, and scientific purposes.

National Park Managers are directed to:

- Conduct scientific studies of the natural flora and fauna, geologic and cultural features, and evaluate the primary threats that could lead to resource degradation.
- In the case of Pantanal and Everglades National Parks their international protection designations place additional requirements to safeguard the outstanding universal values of the natural and cultural resources of these areas.



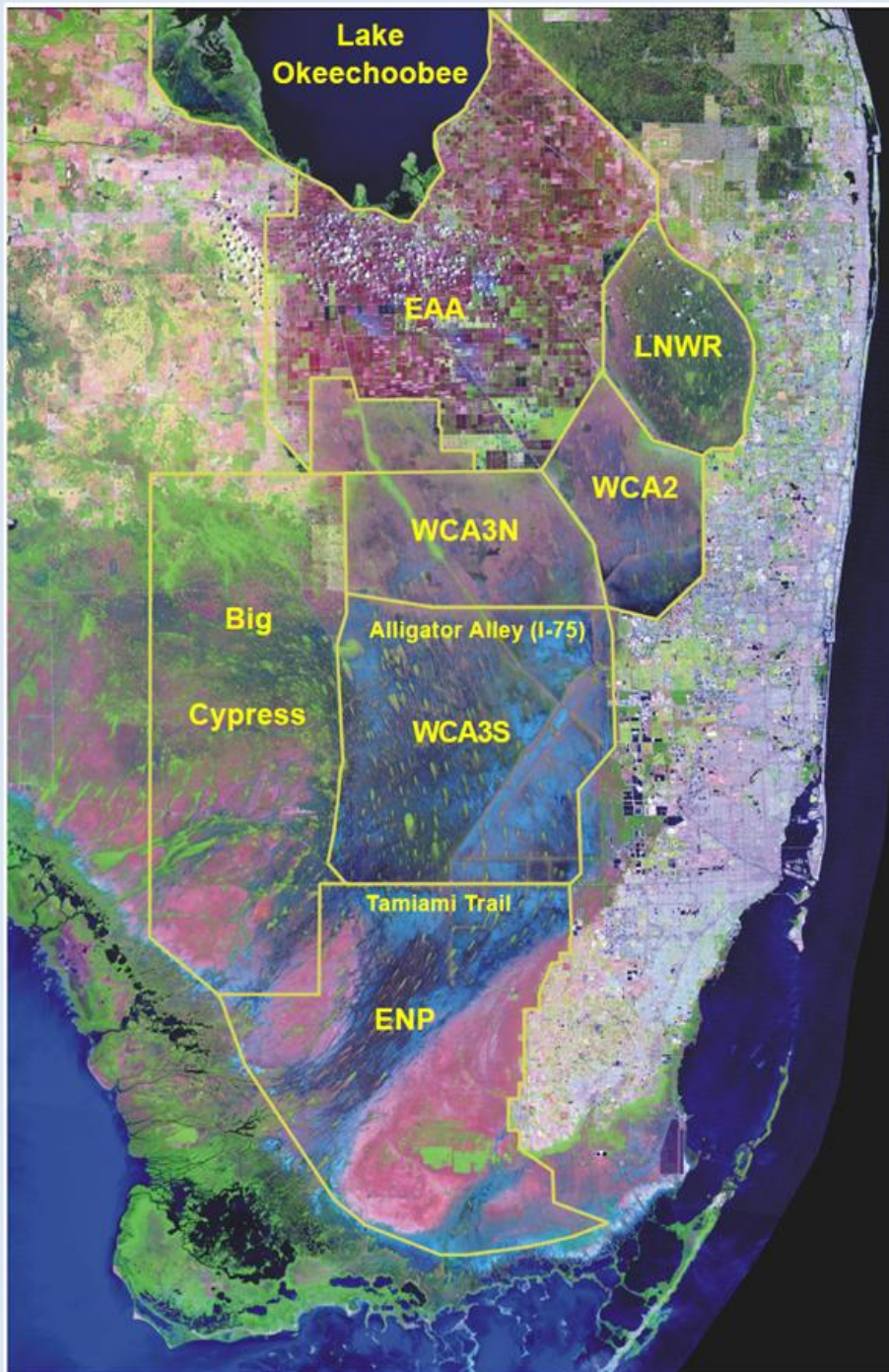
The Pantanal Watershed



- The watershed is 140,000 km².
- Resource exploitation began in 1970's, agricultural/urban development, mining, and a proposed hydrologic alteration project (Hydrovia).
- Pantanal NP is in a remote area far from these impacts, with essentially no human habitation.
- The Park represents a nearly intact ecosystem with natural habitats and species.

The Everglades Watershed

- The watershed is 16,000 km².
- Has experienced intensive drainage and development for more than a century, and massive hydrologic alterations (C&SF Project).
- Everglades NP is adjacent to the densely populated Miami region (urban park).
- The Park contains many critically endangered habitats and species, and has a large percentage of invasive exotic species.



Management of Protected Areas

The 1997 Partner Park Agreement between Brazil and the United States has created an opportunity for comparative wetland studies focused on the Pantanal (relatively pristine) and Everglades (highly altered) ecosystems.

- Landscape-scale studies of the physical, chemical, and biological characteristics of the major habitats in these watersheds.
- Evaluations of key threats: (1) alterations of the volume and timing of water flows that drive marsh water depths and flooding durations, (2) nutrient enrichment and contaminants that can alter food webs, and (3) land-use changes that increase sediment loading and/or introduce invasive exotic species.

Key Comparative Wetland Studies



The role of seasonal and annual hydrologic fluctuations (water flows and depths) and micro-topographic relief on sediment/nutrient transport, habitat disruption, and wetland productivity.

Key Comparative Wetland Studies



Hydro-ecological functioning, and the structure and dynamics of wetland food chains (from vegetation, to fish and macro-invertebrates, reptiles, wading birds, and larger mammals).

Key Comparative Wetland Studies

Nutrient cycling and the characterization and tracking of dissolved organic matter from various upstream sources into and through the oligotrophic wetlands.

