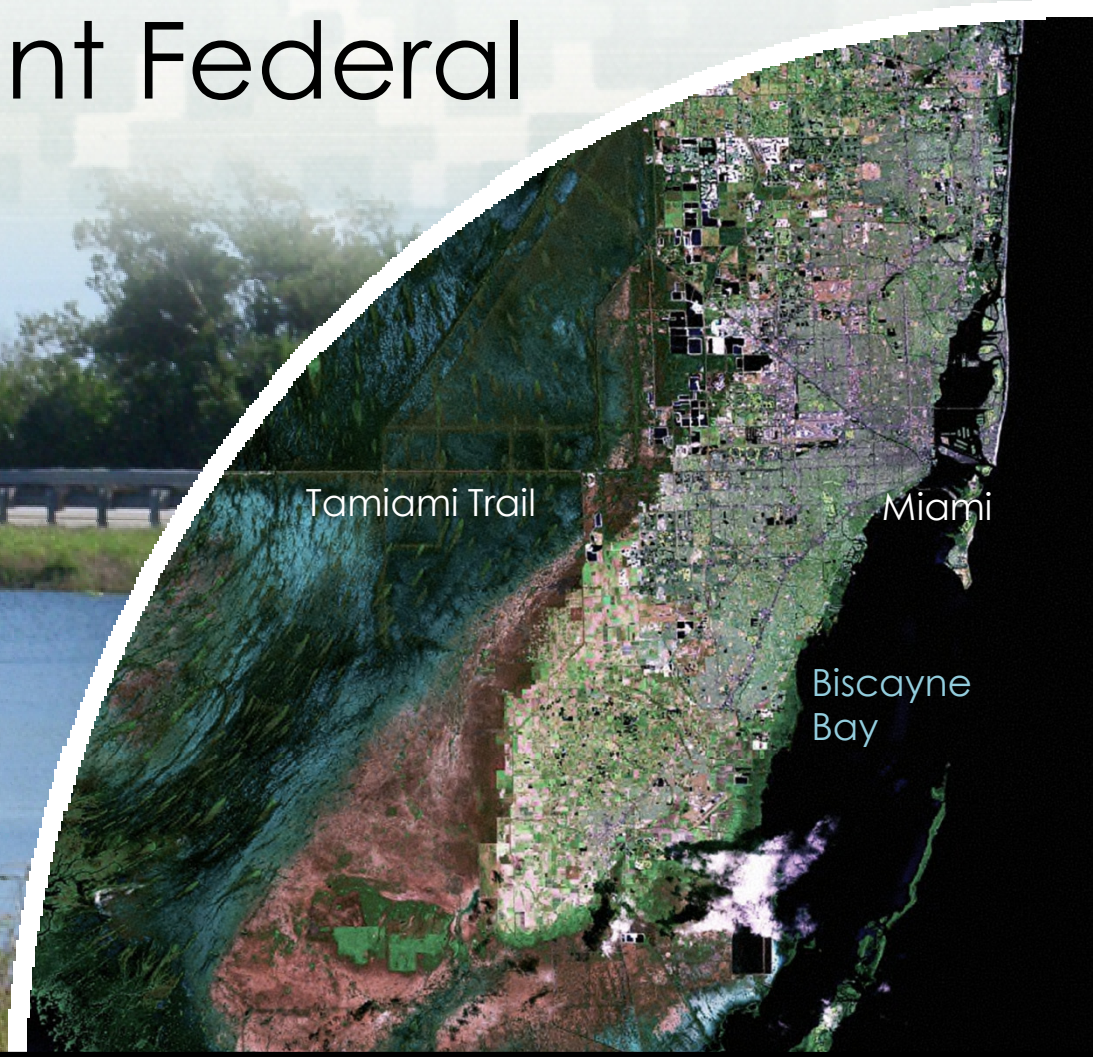
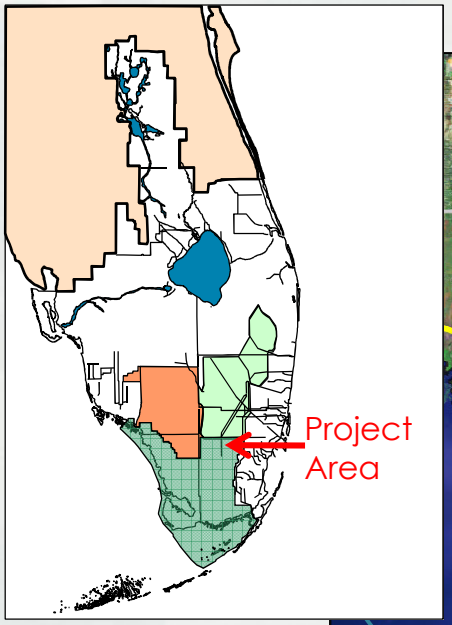
Tamiami Trail: A Comparison of Ecological Benefit Methods Used by Different Federal Agencies

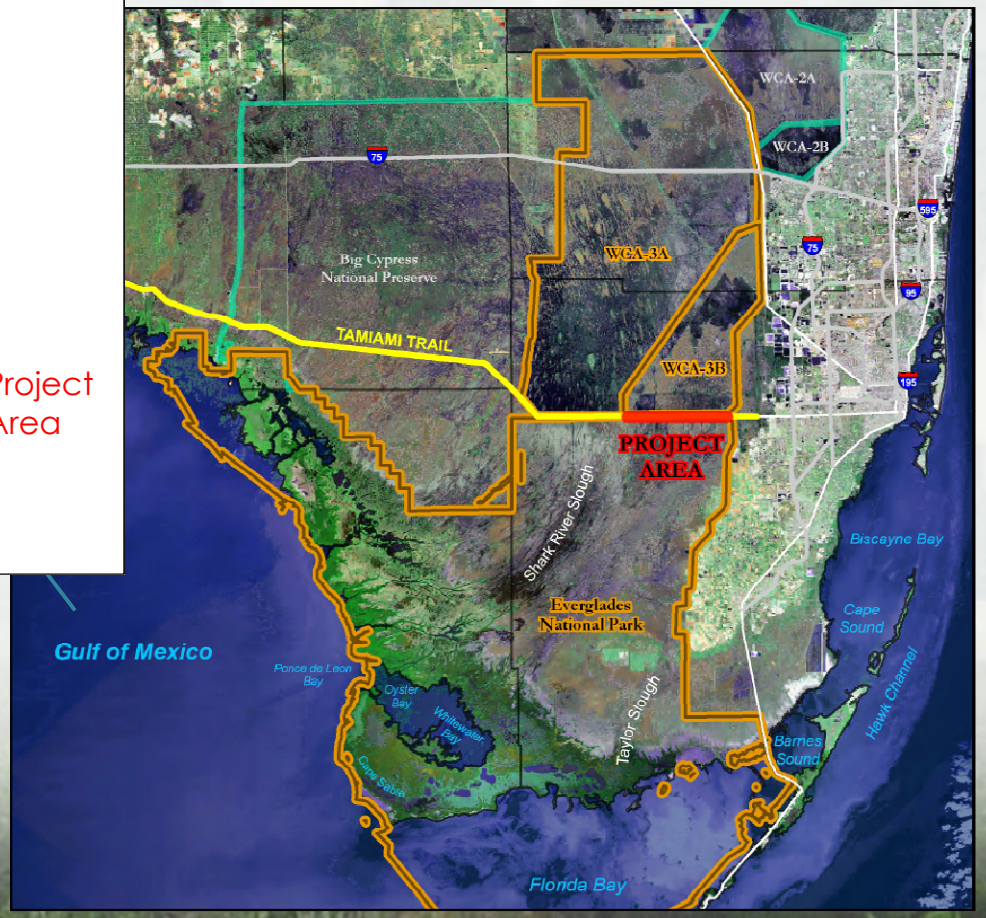


Presented by: Bradley A. Foster
Jacksonville District
US Army Corps of Engineers
August 5, 2011

Location

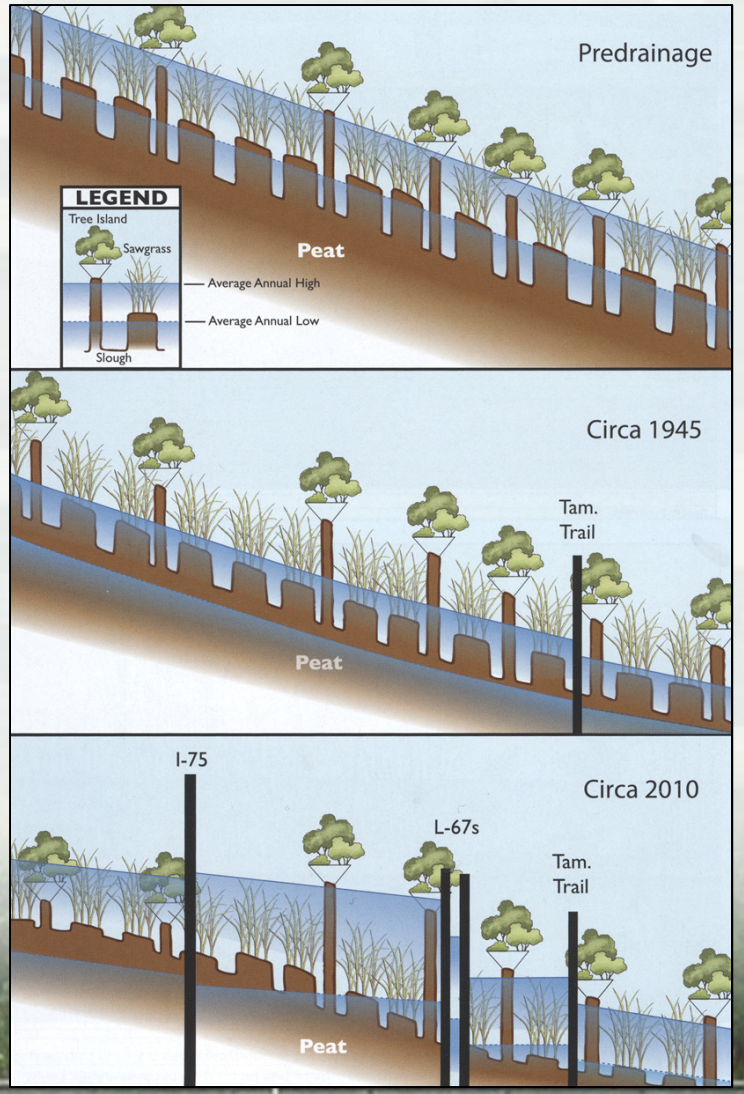
- The Tamiami Trail project is part of Modified Water Deliveries to Everglades National Park - a precursor and foundation project for the Comprehensive Everglades Restoration Plan (CERP)





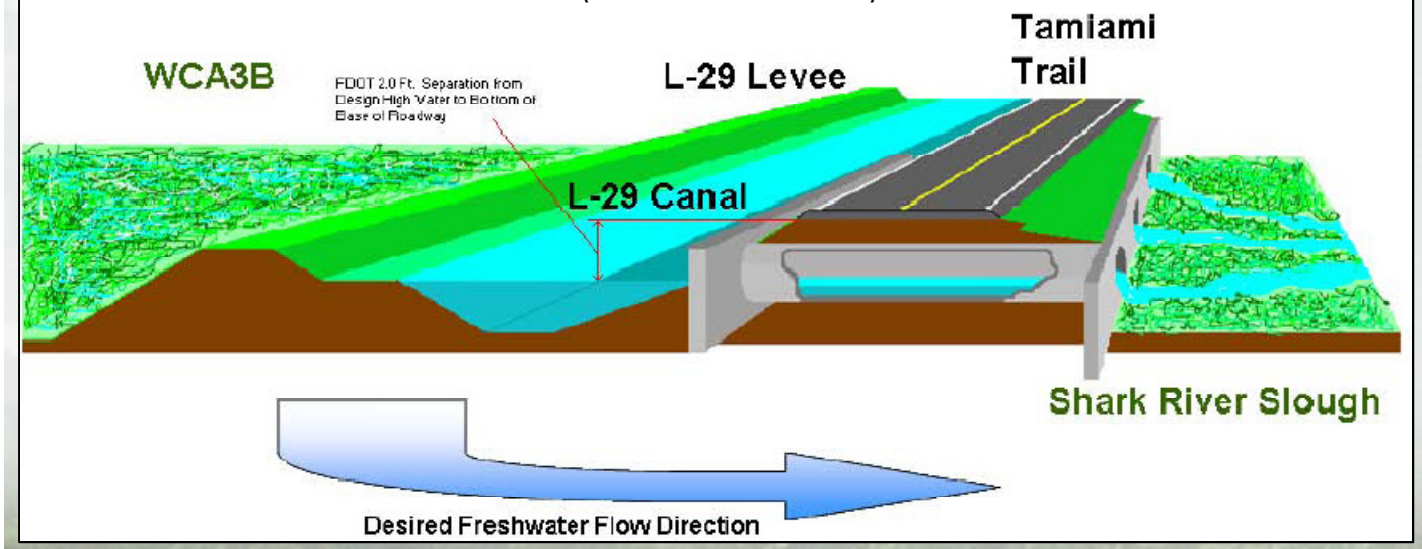
Ecological Problem

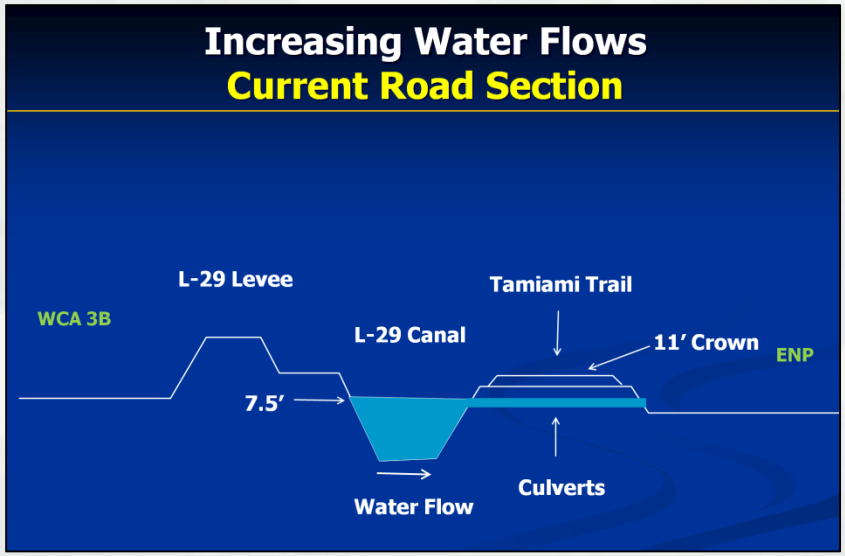
- Barriers and compartments
- Water depth, hydroperiod, and velocity



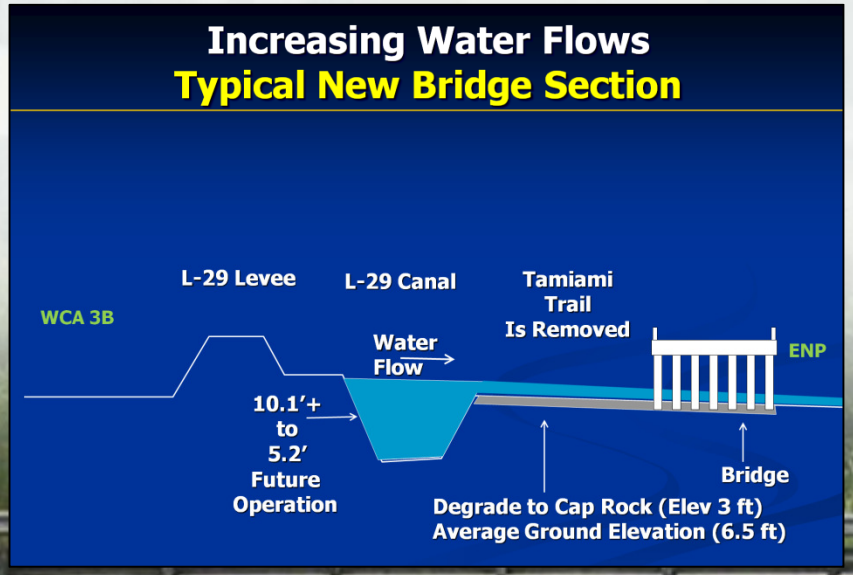
Part of the Problem is Tamiami Trail

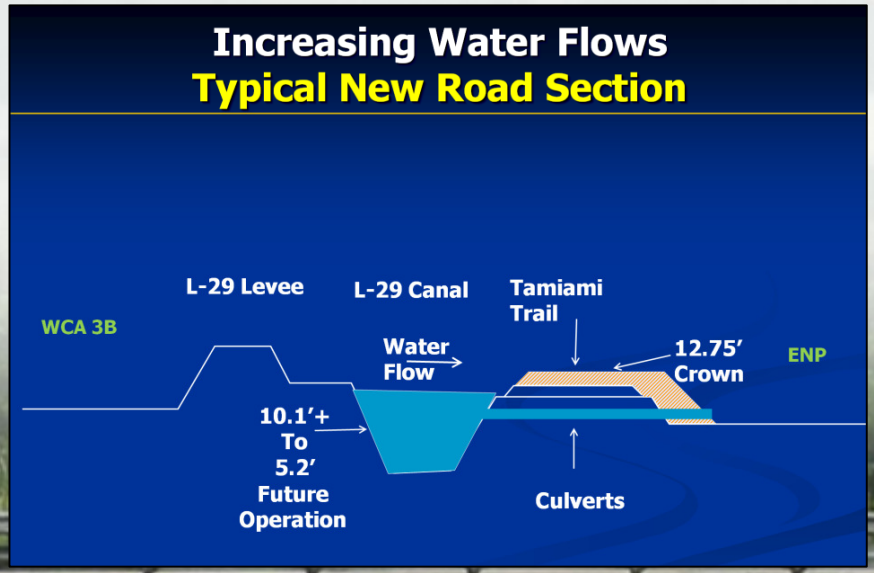
FIGURE 1-6: CROSS-SECTION OF TAMIAMI TRAIL
(current conditions)





Part of the Solution is to Modify Tamiami Trail





Tamiami Trail Key Dates

1928: Construction completed from Tampa to Miami

1940s: Bridges constructed

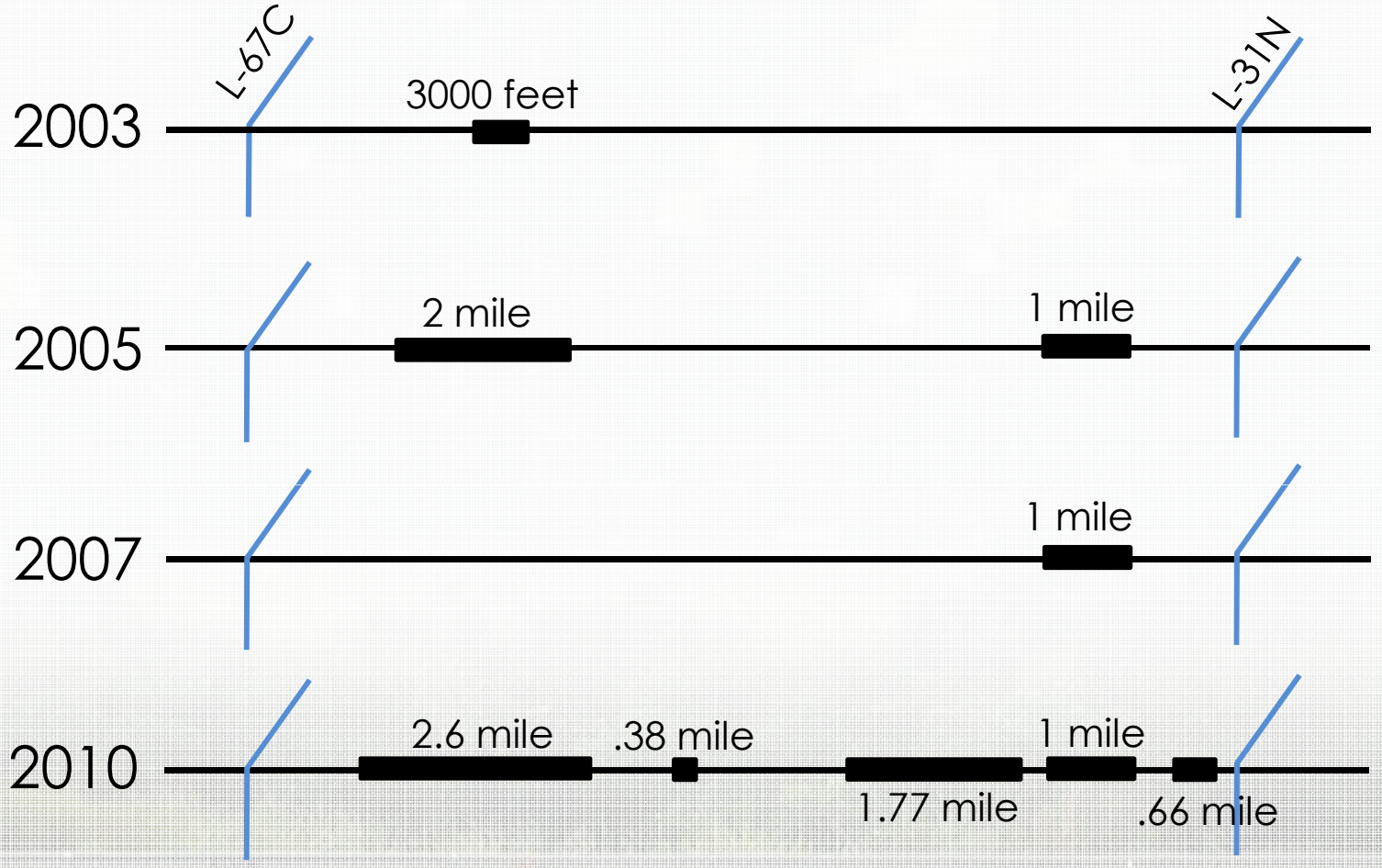
1950s: Bridges replaced by culverts

1950s -1960s : Central and Southern Florida project constructed (levees, gates, pump stations, etc.)

1989: ENP Protection and Expansion Act

- Purchase ~192,000 acres
- Restore hydrology to the extent practicable

Previous Studies



2008 LRR (U.S. Army Corps of Engineers)
2010 EIS (National Park Service)

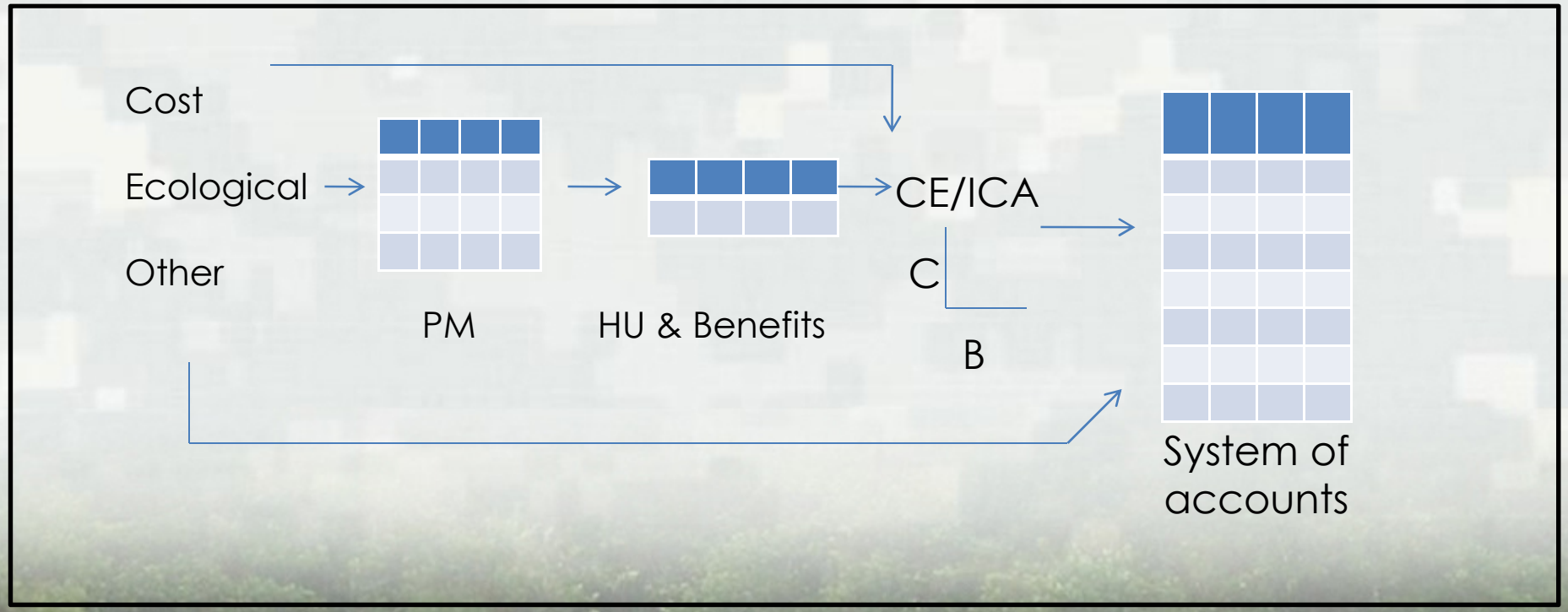
- Compare methods to estimate ecosystem benefits used in the two most recent Tamiami Trail studies
- These benefits methods are integrated into the decision-making process for these studies
- Thus, will consider both benefits and decision-making

National Park Service Process (CBA)

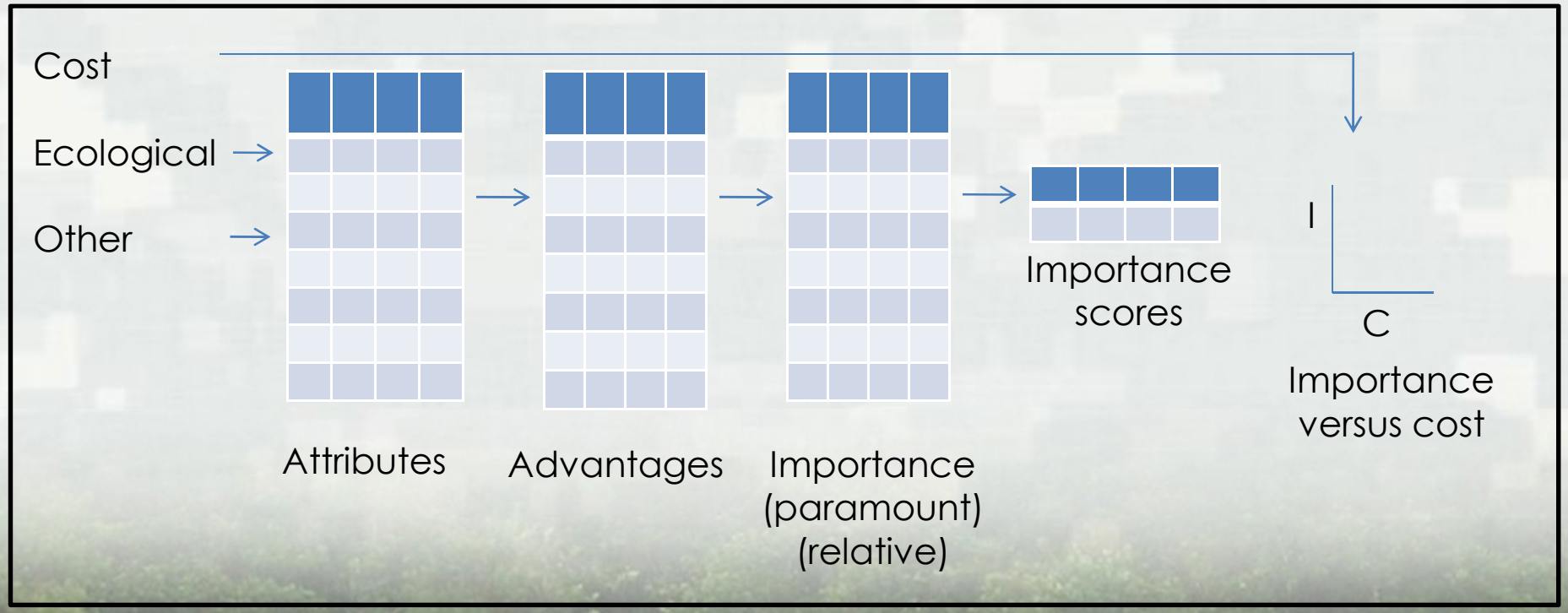
There are five basic steps in the Choosing By Advantages (CBA) decision-making process:

1. Summarize the **ATTRIBUTES of each alternative**
2. Decide the **ADVANTAGES of each alternative**
3. Decide the **IMPORTANCE of each advantage**
4. Weigh **COSTS with TOTAL IMPORTANCE of the advantages**
5. **SUMMARIZE the decision**

U.S. Army Corps of Engineers Process



National Park Service Process



Ecological Performance Measures

Restore water deliveries to ENP

- Average annual flow volumes
- Potential connectivity of Water Conservation Area (WCA3)-B Marsh and NESS as percent of total project length
- One in ten year maximum discharge

Restore Ridge and Slough Processes

- Number of sloughs crossed by bridges
- Difference between average velocity in marsh and average velocity at road
- Flows into NESS provided via bridge

Restore Vegetative Communities

- Number of days water depth at NESRS1 and NESRS2 > 2 ft. during wet season peak
- Number of days water depth at NESRS1 and NESRS2 > 3 ft. during wet season peak
- Average water depth during wet season peak
- Reduction in wildlife mortality

U.S. ARMY CORPS OF ENGINEERS 2008 LRR

NATIONAL PARK SERVICE 2010 EIS

-
- Potential connectivity of Water Conservation Area 3B (WCA-3B) Marsh and NESRS as percent of total project length
-
- Number of sloughs crossed by each alternative
- Difference between Average Velocity in Marsh and average velocity at road
- Flows into NESS provided via bridge
-
-
-
- Reduction in wildlife mortality

Selected Differences

U.S. ARMY CORPS OF ENGINEERS

- Corps process evolved from economic decision methods (e.g. flood control studies) where effects are monetized
  - Net benefit = benefit – cost
- For ecosystem restoration, effects and benefits are quantified but not monetized
  - Benefits are developed using the difference from the without project (no action) condition
  - Benefits are in habitat units
  - Use Incremental cost analysis

NATIONAL PARK SERVICE

- National Park Service uses Choosing By Advantages (CBA)
- CBA can use quantifiable and qualitative attributes
  - Advantages are developed using the differences from the least preferred attribute
- Importance values are assigned to the advantages

Take Home
Corps Process versus NPS Process

- Problems and objectives were the same
- Underlying science and assumptions were similar
- Analytical methods to calculate ecosystem benefits and to select an alternative differ
- At team level, initial discomfort regarding "other agency" process and impression of apparent subjectivity
- Both methods have been used elsewhere and the procedures are reliable
- Identification of selected alternative appears to be driven more by the predicted effects (from science, modeling, etc.) and less by the method of processing of these predictions