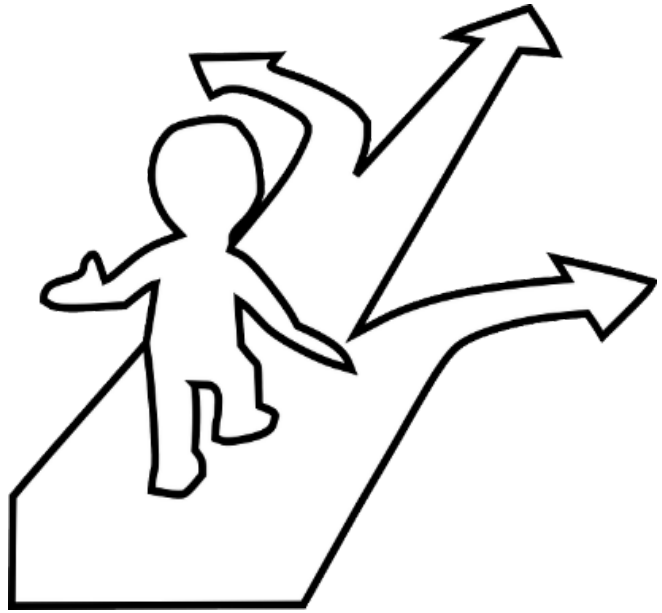
When is Adaptive Management Needed?

When a policy, monitoring plan or restoration objective has two or more of the following:

- False narratives, **misconceptions** or confusion
- The potential for cultural or **economic impacts**
- A **poor understanding** of the ecology
- A high degree of **uncertainty** or risk
- **A history** of compartmentalized, non-participatory decision-making
- A desire to build consensus and **avoid litigation**



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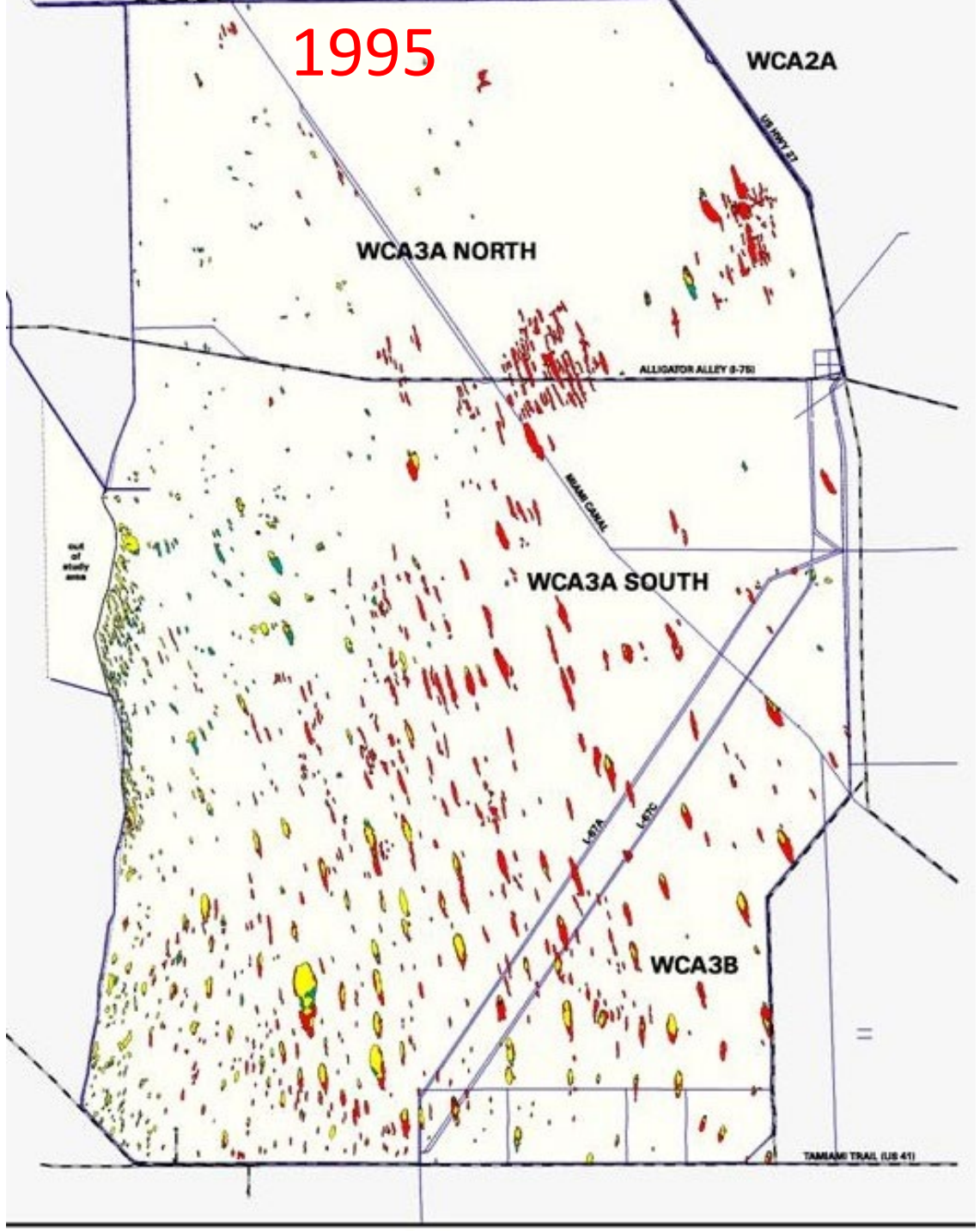


Examples from the Everglades Program:

Example 1: Tree Islands

Problem Statement:

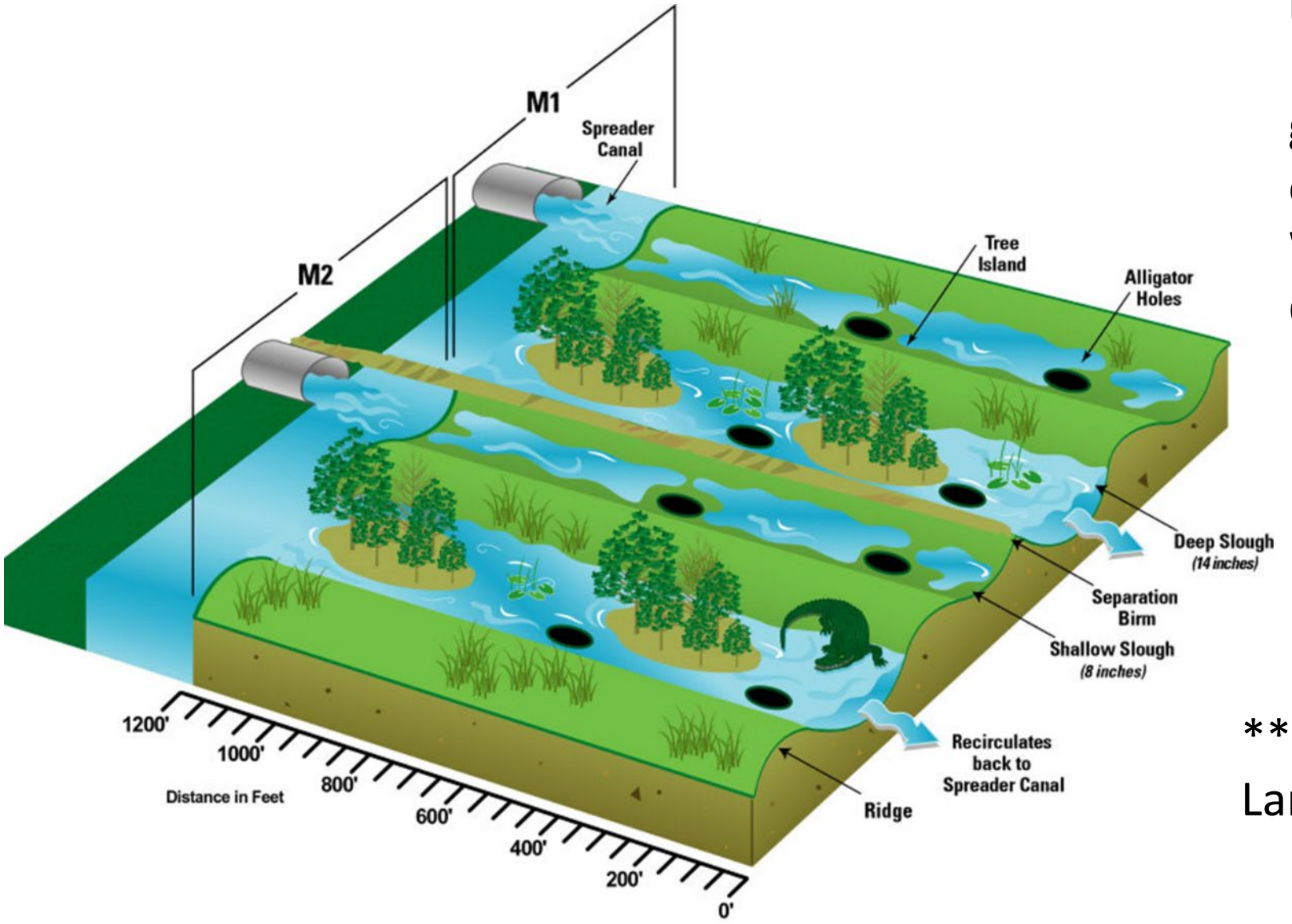
Why did so many tree islands disappear, and can they be restored as part of the Everglades Restoration Program?

Need for Adaptive Management is driven by:

- False narratives, misconceptions or confusion
- The potential for economic or cultural indigenous knowledge impacts
- A poor understand of the ecology

Examples from the Everglades Program:

Example 1: Tree Islands



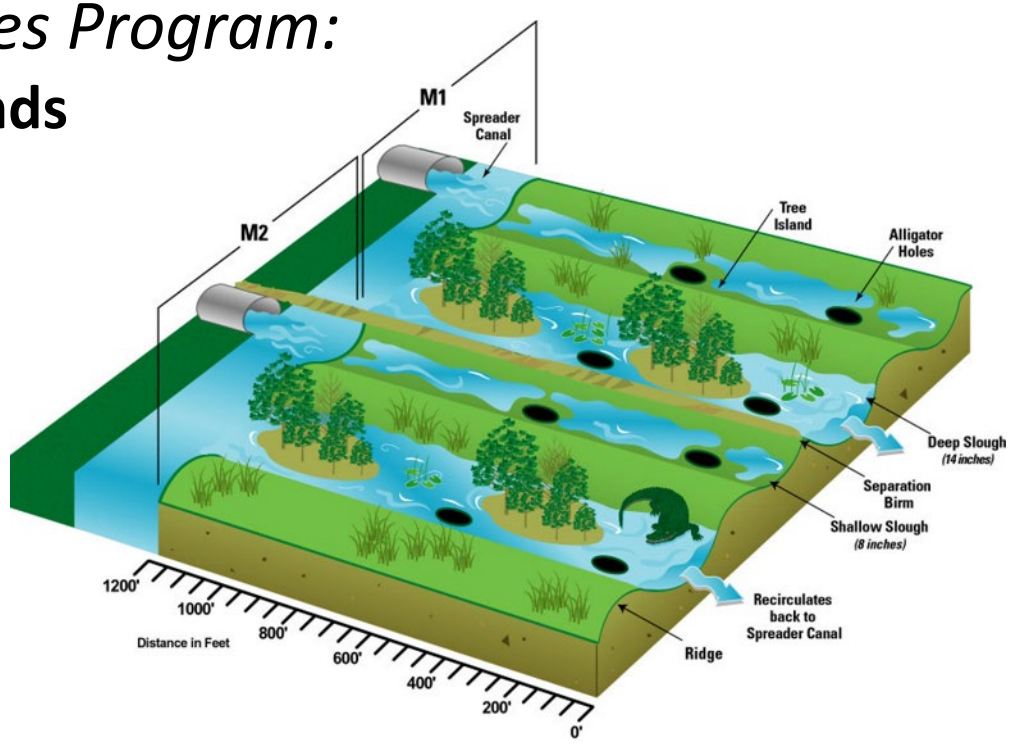
Problem Solution:
Build a Physical Model** to guide operations and the construction of Hardwood Wetland Islands (as part of Central Everglades Restoration).

** Loxahatchee Impoundment Landscape Assessment (LILA)

Examples from the Everglades Program:

Example 1: Tree Islands

Construction of LILA
2002 – 2003

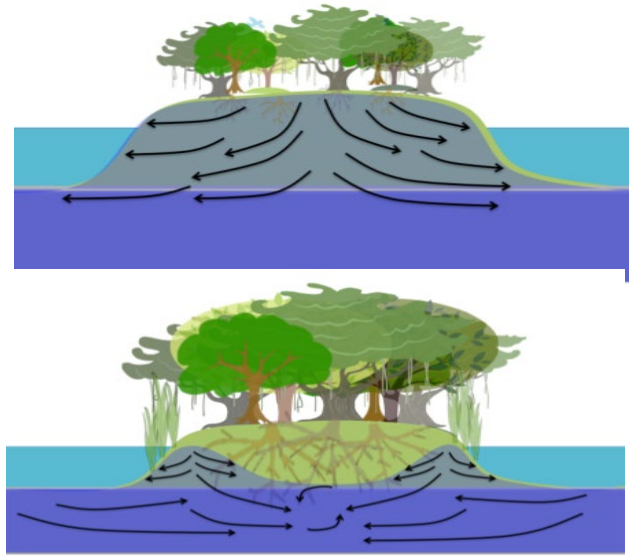


Criteria for the Implementation of LILA

1) Information to reduce uncertainty and risk is **not** needed immediately.
2) There is a mechanism for funding Active Adaptive Management (AM). LILA-AM was considered to be "Programmatic" (i.e., funding is not linked to a specific restoration project).

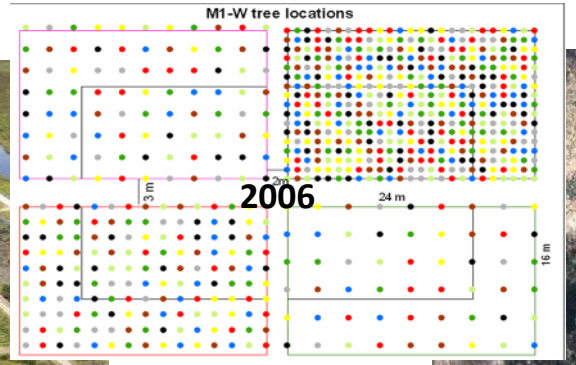
Examples from the Everglades Program

Example 1: Tree Islands



Strengths

1) Provides highly relevant landscape-scale data.
2) It is **outside** the restoration footprint.
3) Captures successional structure & function.
4) Provides guidance for other CERP features.
5) Can be used to "mimic" Climate Change.



Examples from the Everglades Program

Weaknesses

1) Costly and time consuming.
2) It is **outside** the restoration footprint.
3) Focused on a single hydrologic (inundation) "Driver" (**Thus, Example 2**).

Example 1: Tree Islands

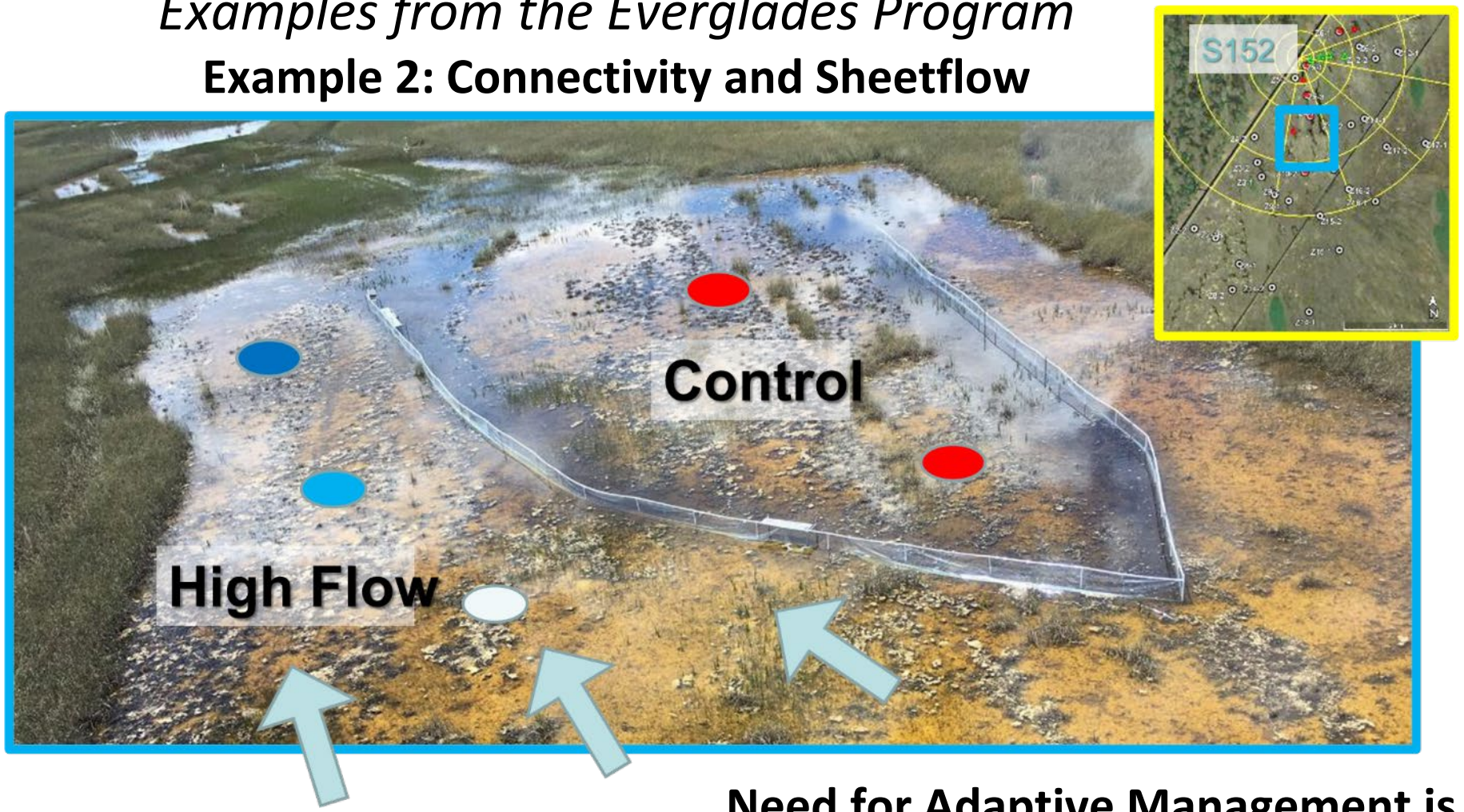
Example 2: Connectivity and Sheetflow

Flow in the Everglades is <1 cm/sec
However: CET* = 2.5 – 3.5 cm/sec

***Critical Entrainment Threshold**

Examples from the Everglades Program

Example 2: Connectivity and Sheetflow



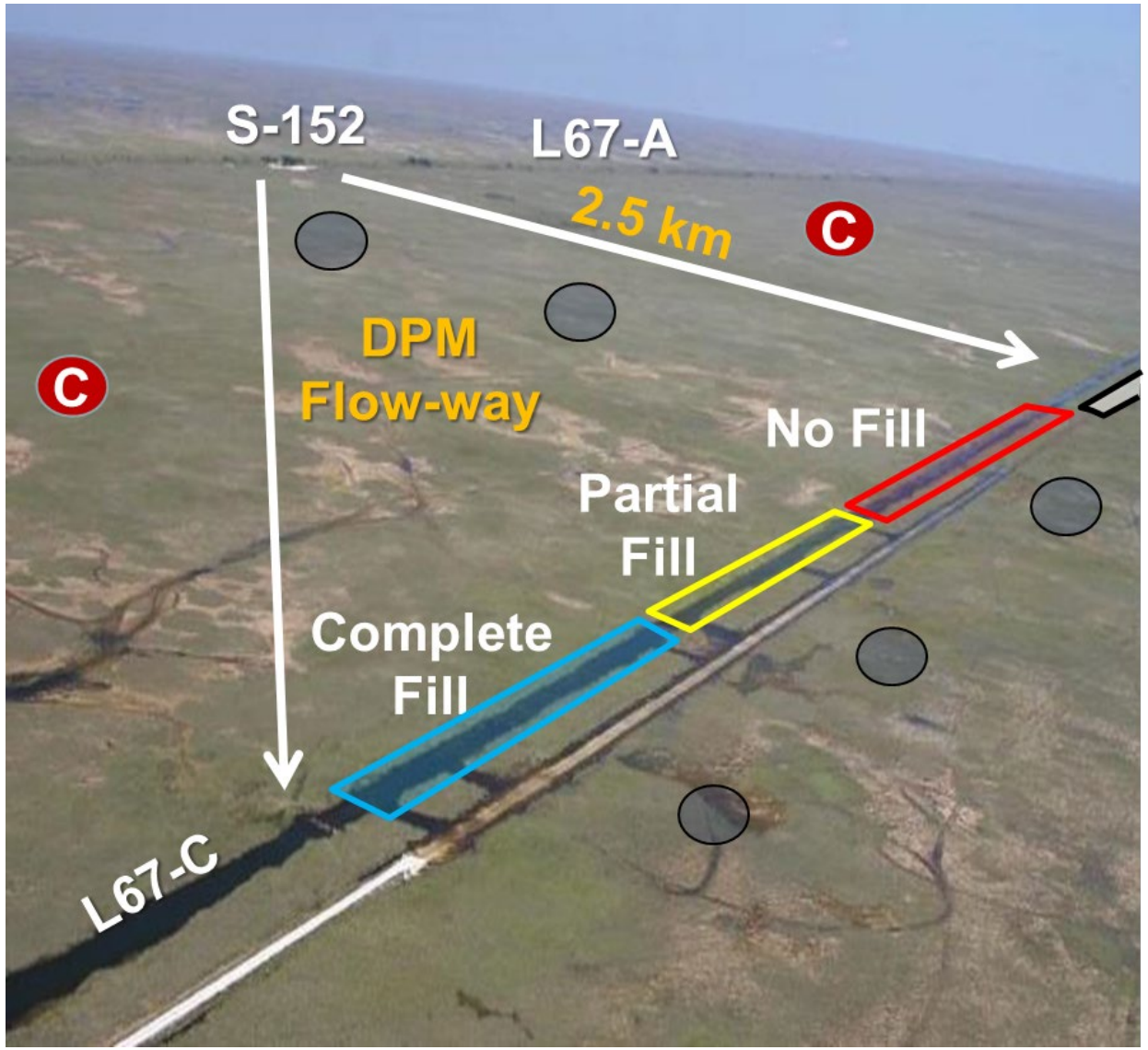
Problem Statement:
What is the appropriate flow velocities needed to restore the "corrugated" Ridge-Slough landscape?

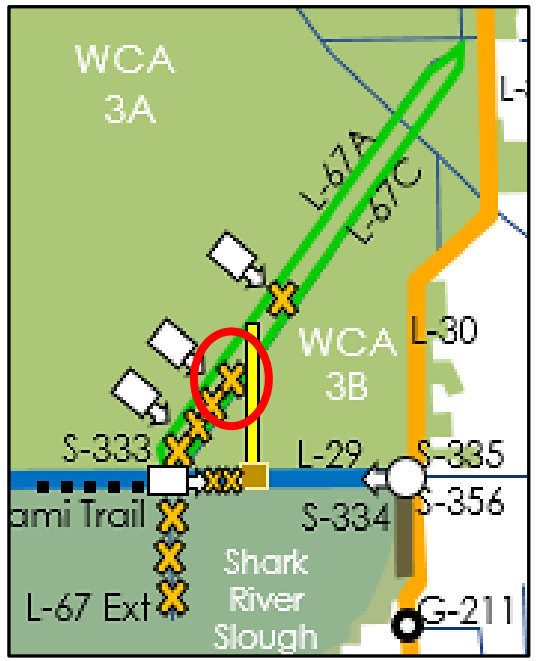
Need for Adaptive Management is driven by:

- Poor understanding of how sheetflow functions to create and sustain a ridge-slough habitat.
- Misconceptions and confusion concerning the need to backfill canals.

Examples from the Everglades Program

Example 2: Connectivity and Sheetflow





Problem Solution: Build a Physical Model** that can guide the operation and structures needed to increase the connectivity of water across spoil banks, levees, roads and canals.

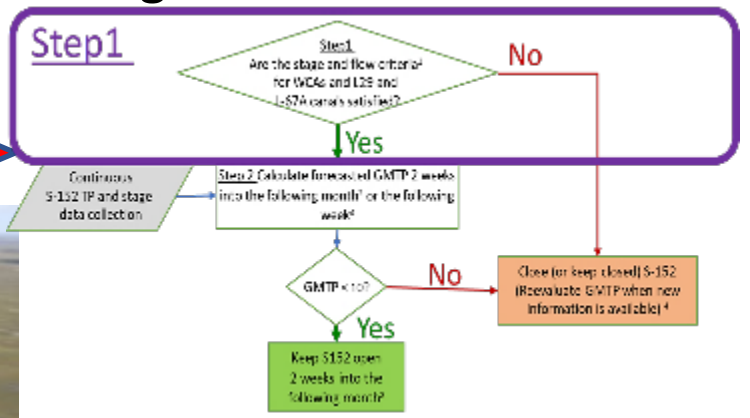
**Decompartmentalization Physical Model (DPM)

Example 2: Connectivity and Sheetflow

Criteria for the Implementation of DPM

1) Information to reduce uncertainty and risk was **not** needed immediately.
2) There was a mechanism for funding Active AM. Adaptive Management is linked to a specific restoration project.

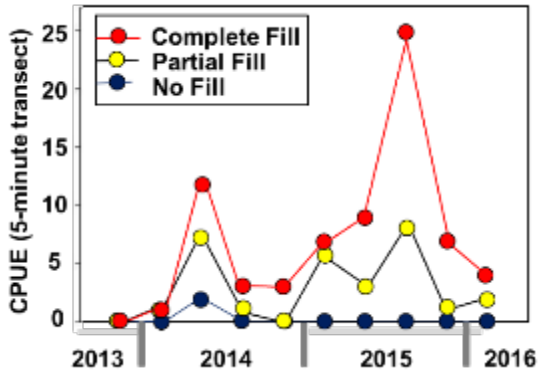
- Provided operational rules



- Demonstrated the need for vegetation management to restore directional flows

- Evaluated the role of canals in sequestering and releasing phosphorus

- Showed that backfilling canals would improve habitat for large fish, including bass



Examples from the Everglades Program

Example 2: Connectivity and Sheetflow

Strengths of DPM (similar to LILA)

1) Provides highly relevant landscape-scale data.
2) It is **inside** the restoration footprint.
3) Captures successional structure & function.
4) Provides guidance for other CERP features.
5) Can be used to "monitor" Climate Change.

Weaknesses of DPM

1) Time consuming and costly.
2) It is **inside** the restoration footprint.
3) Not all recommendations could be implemented because Congress approved funding for the CEPP Restoration Project before the results could be produced. (e.g., The backfilling solutions were not included in the AM "Options Matrix")

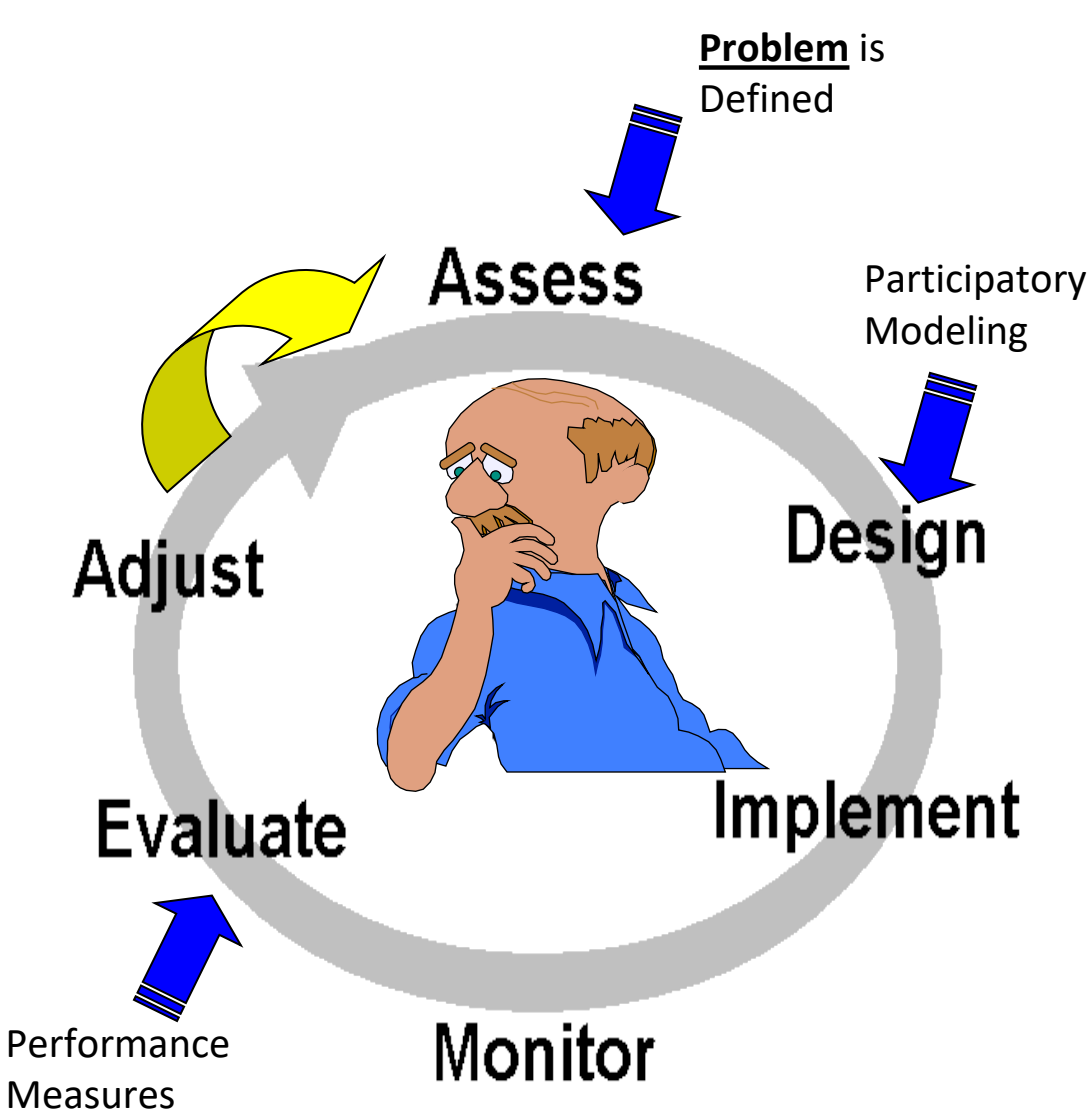
Why is adaptive management so difficult to implement?

Did we forget something?

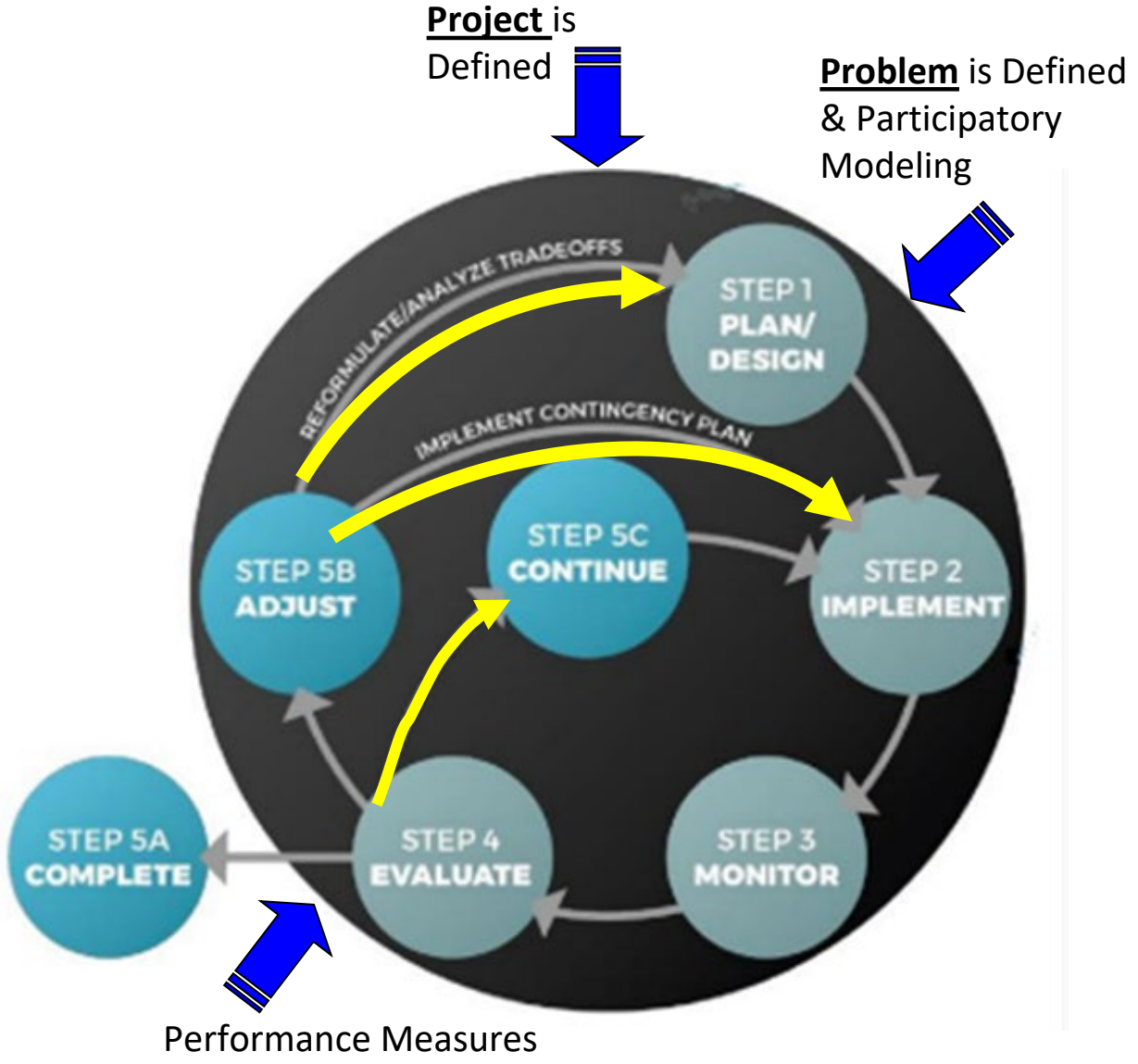
No !

The problem is that AM takes time and policy makers want to see results quickly. How can these two cultures work together?

The AM Foundation vs The AM Approach for an Everglades Restoration Project



The AM Foundation



The AM Approach in the Everglades

Is Adaptive Management Working?
Is it Robust Enough to Deal with Climate Change?

Strengths

- Creates a forum for stakeholder participation & collaborate learning
- Builds a common understanding of the issues and increases trust
- Identifies research, modeling and monitoring requirements
- Builds consensus and reduces the probability of litigation

Weaknesses

- Stakeholders are not prepared or willing to participate
- No Institutional buy-in or policy on stakeholder participation is limited
- Research, modeling and monitoring is costly and time consuming
- Climate change models/predictions are not robust and are not at the scale of most restoration projects.

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