Active management in support of ecosystem restoration

Christa Zweig, Susan Newman, Colin Saunders, and Fred Sklar
Some systems have undergone drastic changes from pre-disturbance conditions.

Indirect restoration may not suffice.

Loss of:
- Topography
- Landscape pattern
- Ecosystem engineers
- Ecological drivers (disturbance, natural periodicity, etc.)
History of active management in Everglades

- Invasives
  - Plant—large scale eradication of Melaleuca, Brazilian pepper, Lygodium
  - Animals—pythons and other reptiles

- Pattern restoration
  - Fire programs
  - Tree island plantings
  - CHIP/AMI
Central WCA3A South

Over-drained

Impounded
**CERP PROJECT**

**Decompartmentalization (DECOMP)**

Considered the “heart” of Everglades Restoration, is the removal of levees and the backfilling of canals in Water Conservation Area 3 as a way to restore the hydrology of the Everglades.
Decomp Physical Model

- WCA-3A
- WCA-3B
- S-151
- Tamiami Trail
- DPM
- Miami Canal
- L-67A
- L-67C
- WCA-3B
- Tamiami Trail
Decomp Physical Model flow way

WCA-3A

DPM Flow-way

2.5 km

Canal Backfill

Levee Removal

WCA-3B
Flows in DPM

- SF$_6$ (D. Ho)
- Dye (E. Cline)

- S-152
- 0.4 cm/s
- 0.3 cm/s
- 1 cm/s
- 2 cm/s
- 1 cm/s
- 5 cm/s
What can we do?

- Active management experiment or “Brute Force Science”
  - Can we change direction of flow?
  - Can we increase flow speeds and propagate it further into the DPM footprint?
  - Can we create microtopography?
  - Can we create differential flow (ridge vs. slough)?
  - What is the best option for active management of an over-drained ridge and slough landscape?
    - Cut vs. smash
Phase 1: “Zweig slough”—cut
Dual synthetic tracer/flow
Dual synthetic tracer

DST recovered (grams/magnet)

Tracer drops

100 m
Phase 2: “Smash” slough

~ 6 cm/sec

~ 1.5 cm/sec
Propagate flow further?

~89 m

~ 6 cm/sec

~ 1.5 cm/sec
## What did we learn?

<table>
<thead>
<tr>
<th>Question</th>
<th>Smash</th>
<th>Cut</th>
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<tbody>
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Look Mom! I’m on Google Earth!
Acknowledgements

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