



# Fine Tuning Everglades Restoration: The LILA Facility

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## Background:

Everglades restoration is an enormous effort including many projects and activities outlined in the Comprehensive Everglades Restoration Plan (CERP), funded by the South Florida Water Management District and the Army Corp of Engineers. Scientists use the Loxahatchee Impoundment Landscape Assessment (LILA) facility to assist in developing performance measures for Everglades restoration.

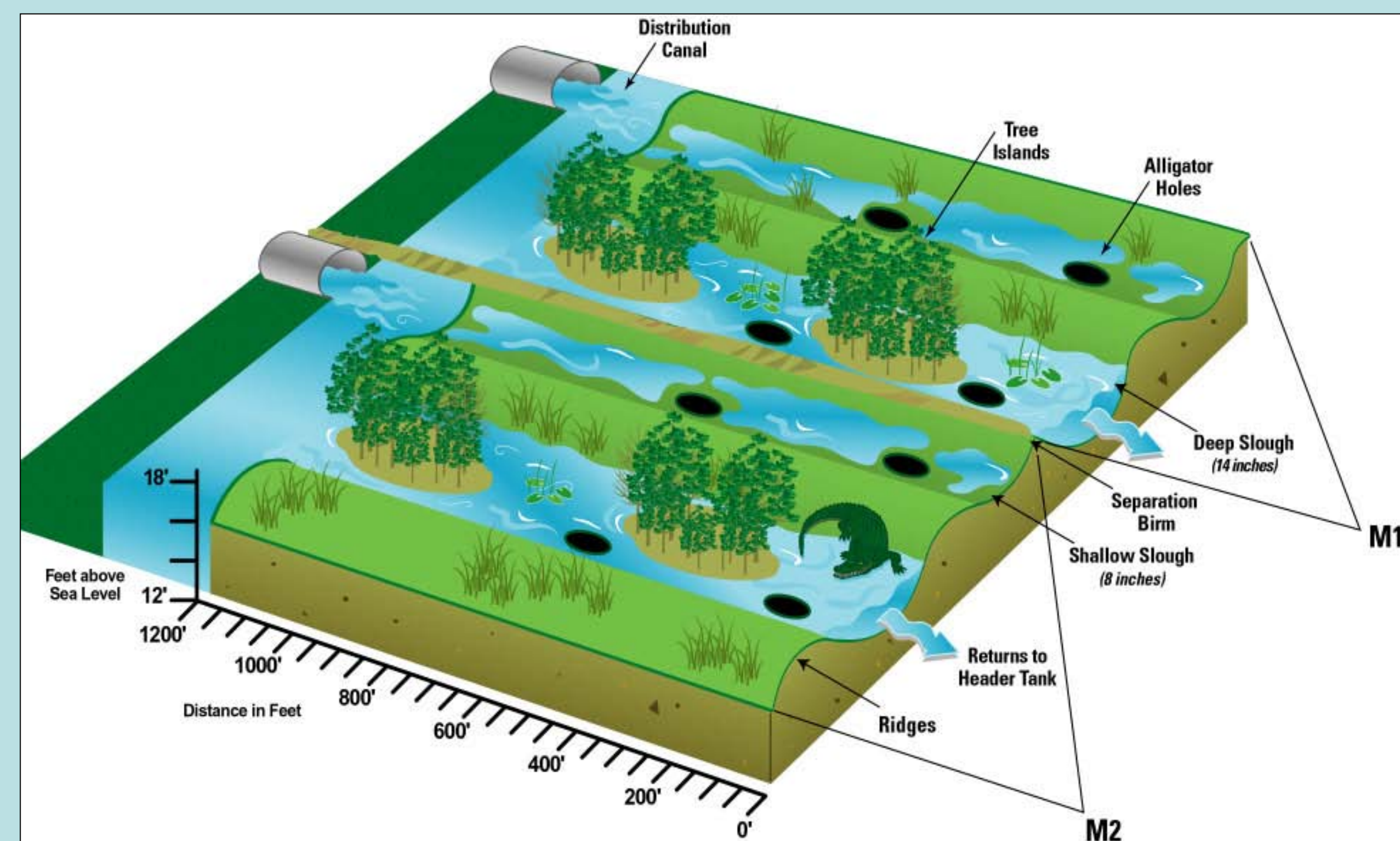
**The strength of LILA is that the certainty of data interpretation is high because hydrology and other critical processes are controlled and replicated.**

## Project Design:

LILA consists of four independent replicated 20-acre impoundments or “macrocosms” built from existing wetland compartments at the US Fish and Wildlife Service’s ARM Loxahatchee National Wildlife Refuge. Water depths and flows are controlled by a re-circulating water system and are manipulated to induce responses from tree island, ridge and slough and wildlife communities.



Infrared aerial photograph of macrocosm #2 (M2)



Landscape features of two macrocosms located at the Arthur R. Marshall Loxahatchee National Wildlife Refuge.

## Research Projects at LILA:

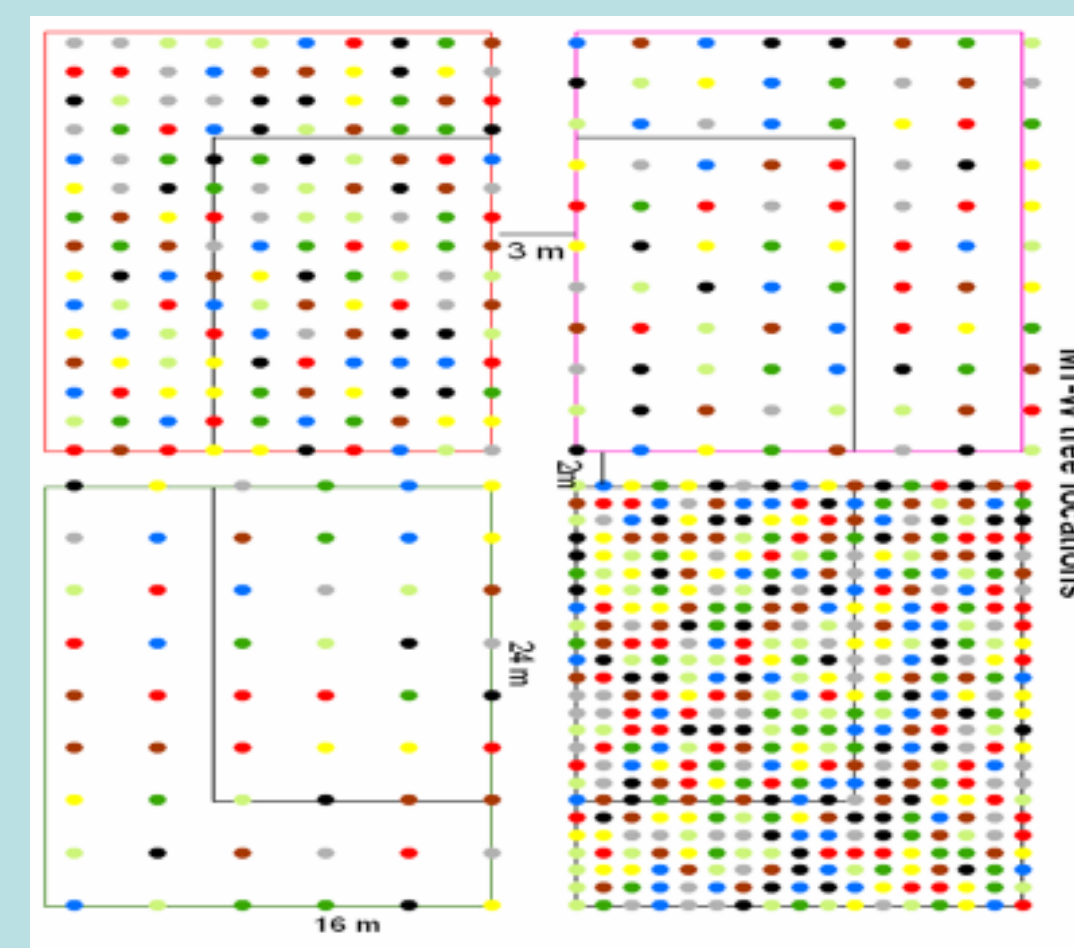
### I. Tree Island Vegetation

Suitability of native woody species for tree island restoration. The effects of water depth and planting density on survival and growth.

References:

Wetzel, P., E.A. Cline and A. van der Valk. 2008. Restoring Tree Islands in the Everglades: Experimental Studies of Tree Seedling Survival and Growth. *Restoration Ecology* (16:2)

Stoffella, S. L., Ross, M. S., Sah, J. P., Price, R. M., Sullivan, P. L., Cline, E. A. and Scinto, L. J. 2010. Survival and growth responses of eight Everglades tree species along an experimental hydrological gradient on two tree island types. *Applied Vegetation Science*, no. doi: 10.1111/j.1654-109X.2010.01081.x



Plant density grid for one of eight islands planted



Six thousand trees planted across the eight tree islands

### II. Prey Vulnerability to Avian Predation

Wading bird foraging behavior in relationship to water depth and vegetation density.

References:

Lantz, S. M., D. E. Gawlik, M. I. Cook. 2010. The effects of water depth and submerged aquatic vegetation on the selection of foraging habitat and foraging success of wading birds. *The Condor*, no. doi: 10.1525/cond.2010.090167



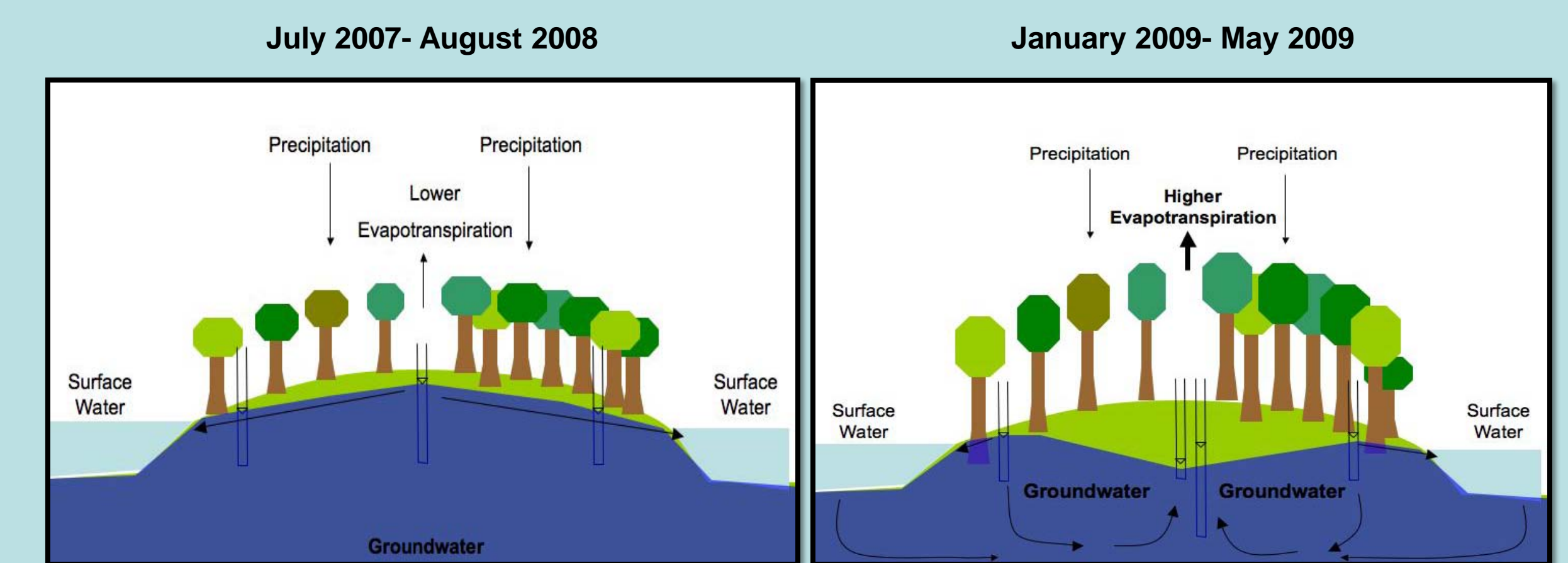
Wading birds feeding within a study enclosure

### III. Tree Island Hydrology

The impact of woody species on the movement of groundwater and the chemistry of groundwater, surface water and soils.

References:

Sullivan, P. L., R. M. Price, M. S. Ross, L. J. Scinto, S. L. Stoffella, E. A. Cline, T. W. Dreschel, F. H. Sklar. 2010. Hydrologic Processes of Tree Islands in the Everglades: Tracking the Effects of Tree Establishment and Growth. *Journal of Hydrogeology* (in press).



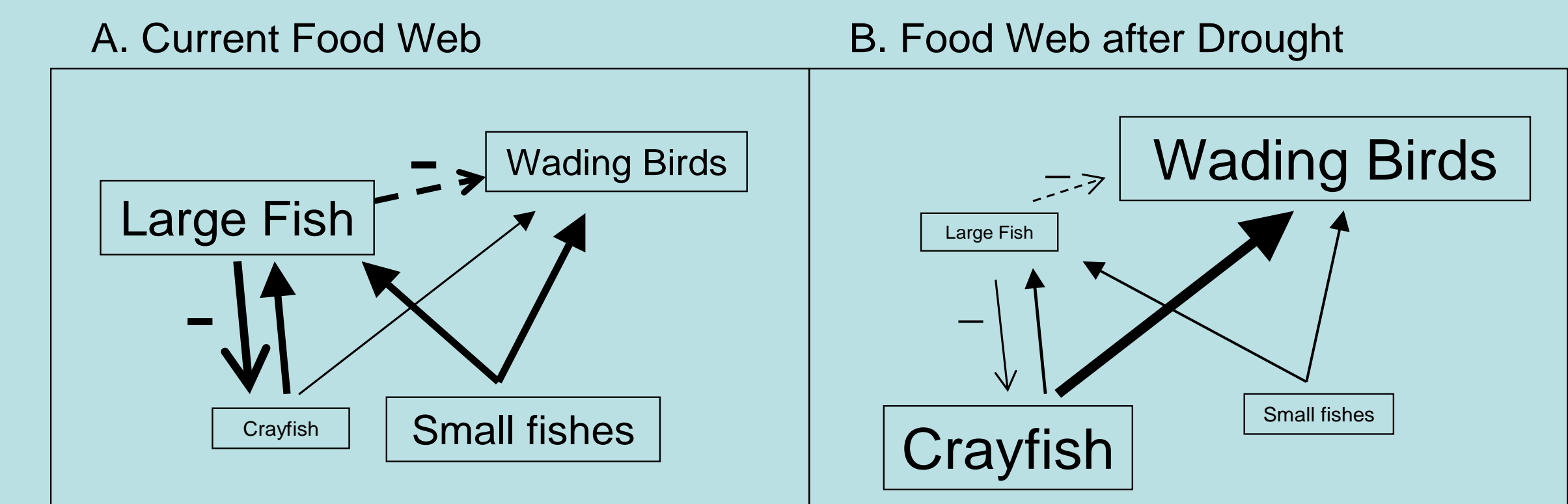
Conceptual model of groundwater movement within the tree islands as the trees mature

### IV. Drought Mediated Predator – Release Hypothesis

The impact of predator removal (due to drought) on crayfish populations and wading bird foraging response.

References:

Dorn, N. J. 2008. Colonization and reproduction of large macroinvertebrates are enhanced by drought-related fish reductions. *Hydrobiologia* 605: 209-218.



Wading birds responding to a simulated drought

### Acknowledgements:

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