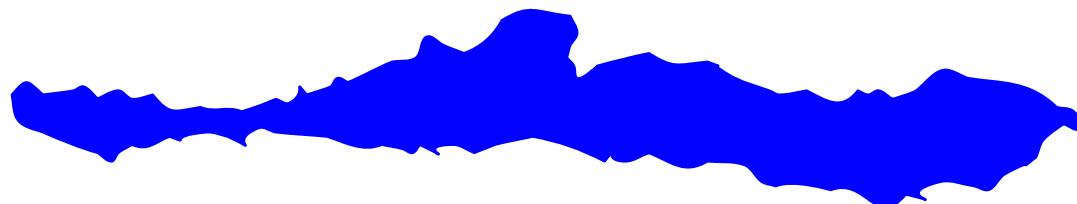


A New Farming Systems Development Initiative

Ed Hanlon, Soil & Water Concepts

John Capece, Intelligentsia International

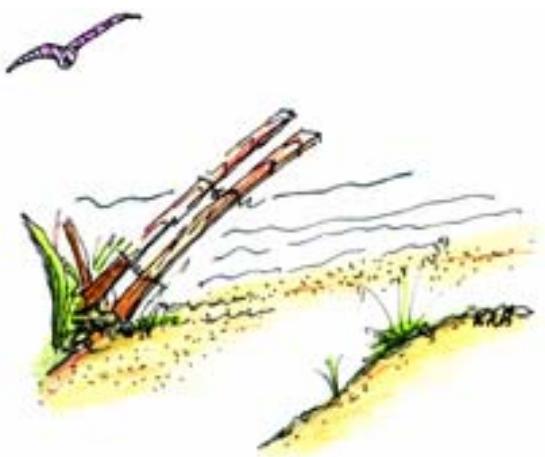


Managing the Land to Manage the Water



Presentation Outline

- Biofuels Center Project Components
 - **Farming Systems & Sustainability Research**
 - Sustainability Analysis (Natural Resources & Energy)
 - Economic Analysis (Ecosystem Services Markets)
 - Educational Components



Hendry Co. Sustainable Biofuels Center

Biofuels Systems Evaluation

- Sustainability Indexing
- Technology & Farming Sys.

Workforce Development

- Secondary & College

Economic Development

- Assisting All Companies
- Attract Biofuels Investment
- Develop the Center



Demonstration Projects

- Farming Systems Research
- Comparison Methodologies
- Economics
- Energetics (Energy)
- Greenhouse Gas Balance
- Natural Resources
- Compensation Mechanisms
- Sustainability



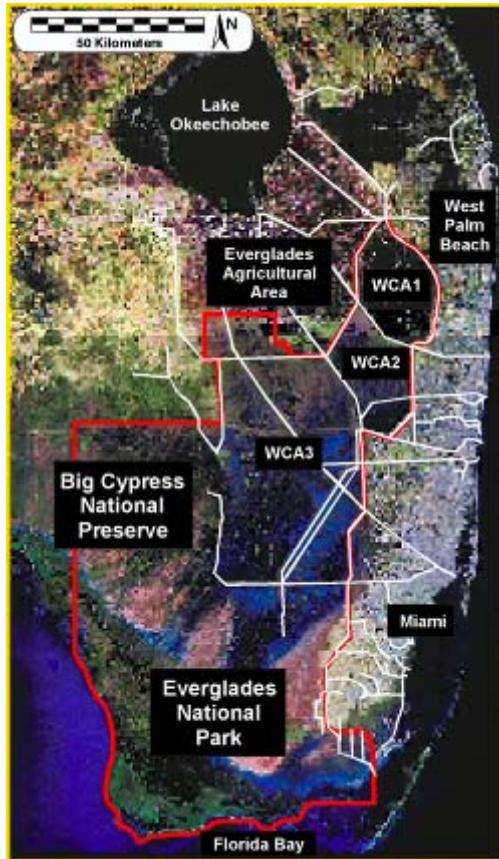
Research & Development Components

Name	Role
<u>Edward A. Hanlon</u>	Project Manager
Dean W. Roshon	Education
<u>John C. Capece</u>	Research & Education
John M. Owens	Biofuels
Alan Wade Hodges	Economics
Laila A. Racevskis	Economics
Tatiana Borisova	Economics
<u>Gene McAvoy</u>	Extension
<u>Leslie E. Baucum</u>	Extension

Name	Role
<u>Sanjay Shukla</u>	Water Management
<u>Monica Ozores-Hampton</u>	Horticulture
<u>Robert A. Gilbert</u>	Agronomy
<u>Alan L. Wright</u>	Soils
Andy Ogram	Soils
Matthew Cohen	Forestry & Energy
Mark Brown	Energy Analysis
Bruce Welt	Engineering

- Underline indicates Co-PIs involved with Alternative Farming Systems

Agricultural Land Issues



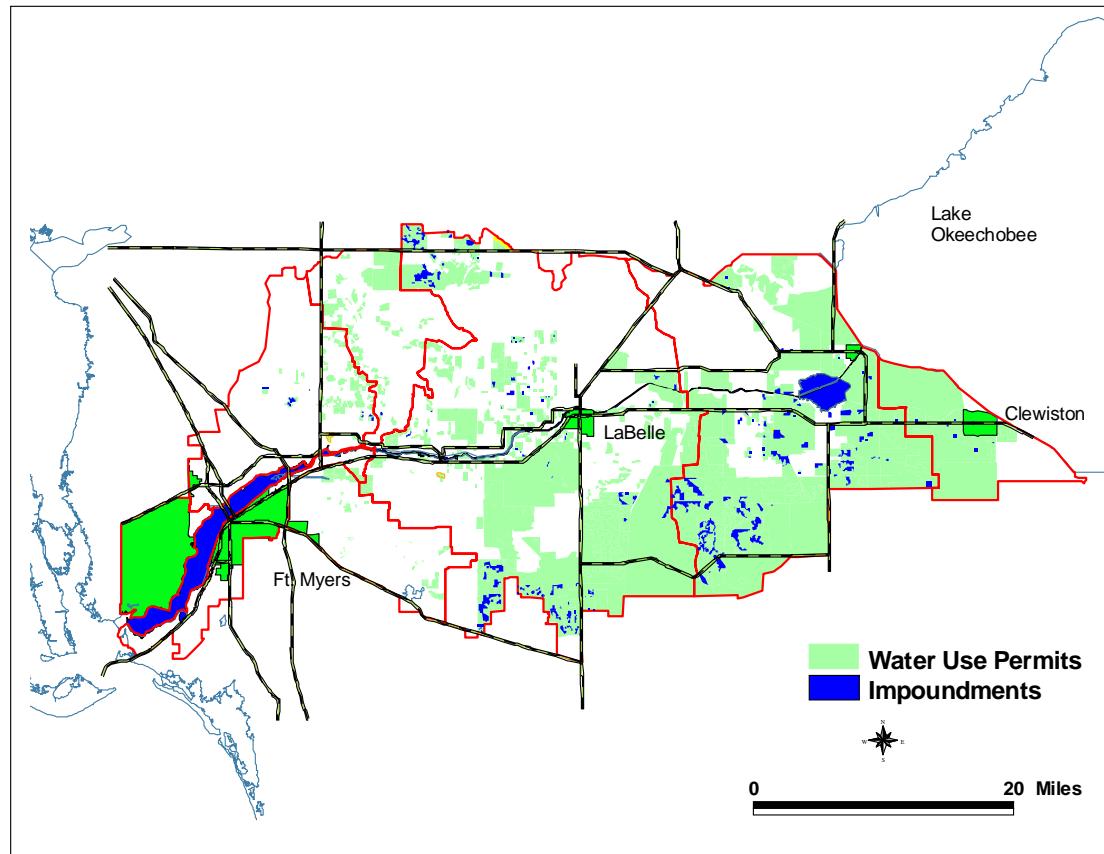
Map: C. Fitz, 2007

- STAs and WCAs are examples of multiple use restored lands
- Selected Eco-system Services:
 - Water storage
 - P and N removal from inflow water
 - Carbon storage in both soil and plant communities



Agricultural Land Issues

- Reasons for state land purchases:
 - Eco-systems services ***
 - Control of land by WMD for ease of management
- An alternative to large works are distributed systems

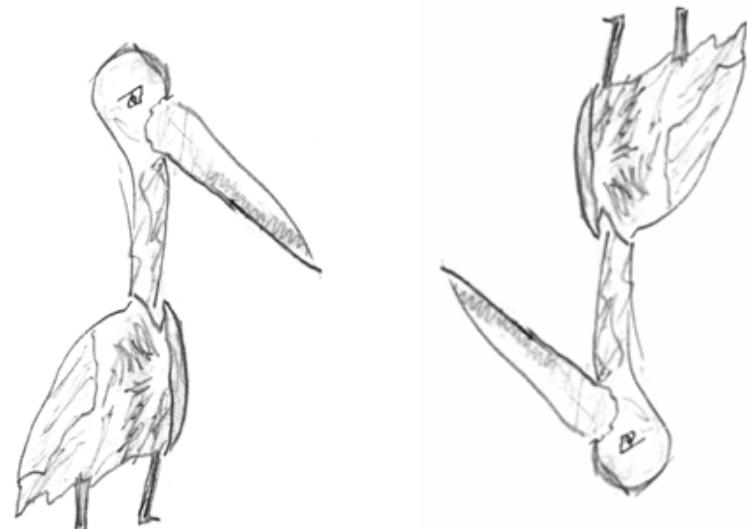


Map: S. Shukla, 2005

New Farming Systems Concept

The creation of dramatically new farming systems offers an alternative to the current “two sides of the ditch” model in which...

On one side of the ditch are yield-maximizing, input-intensive, **commodity price-dependent farms.**



On the other side of the ditch are publicly-financed, nutrient-removing treatment areas and water reservoirs trying to mitigate the **externalized costs of our food production systems and other human-induced problems.**

Estimating the Value of Water Storage C43 West Reservoir

Parameter	HIGH Estimate	LOW Estimate
Construction Cost Estimate	\$500 Million	\$350 Million
Total Annual Cost Estimate	\$29 Million	\$21.5 Million
Effective Storage (gallons)	25 Billion	25 Billion
Effective Storage (1000 gal)	25 Million	25 Million
Effective Storage (acre-feet)	53,000	53,000
Value of Water Storage	\$1.18/1000 gal	\$0.88/1000 gal
Value of Water Storage	\$340/acre-ft	\$288/acre-ft

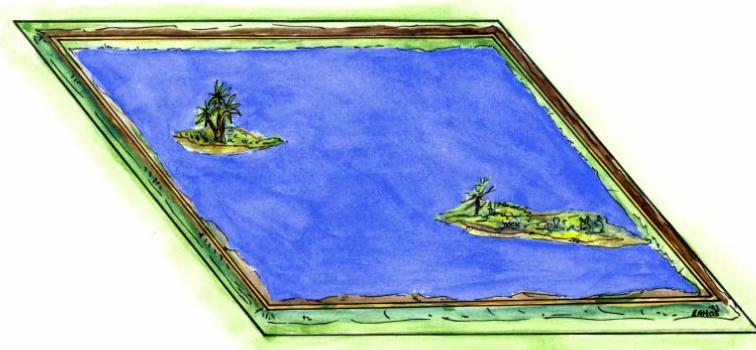
Analysis assumes equal value for stored high-flow water and released low-flow water.

Agricultural Eco-system Services

- Alternatives to building large treatment plants
 - Distributed design in the upper watershed
- *Potential* alternative income streams for :
 - Water storage
 - Carbon storage
 - N and P removal
- Markets for these services are developing
 - Similar to Organic Industry 10 to 15 years ago
 - Derivatives (?)

Sustainable Farming Systems

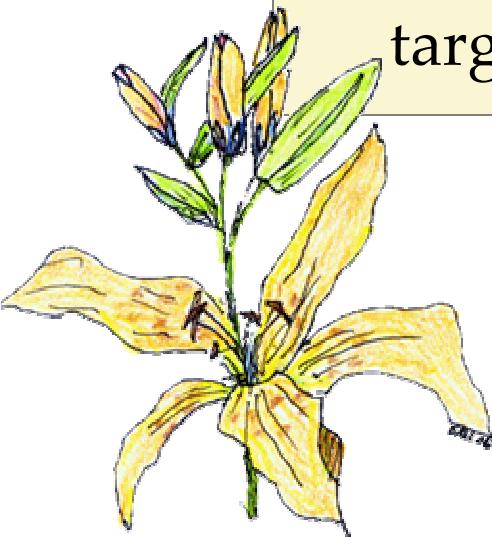
- Based on flood-tolerant sugarcane & other suitable crops.
- Allowing for greater water flow-through and/or storage on farms (e.g. Recyclable Water Containment Areas)



- Reduction of muck soil loss (subsidence), a major factor in the carbon balance of EAA
- Requires changes in many aspects of horticultural practices: crop rotations, fertility management, diseases & pests, farm operations & equipment

Agricultural Eco-Services

- In water quality area, additional advantages are:
 - **Flexibility** with incentives to **innovate** – invent new, more cost-effective solutions (not calling these solutions BMPs)
 - **Incentives to achieve** specific **environmental outcomes** (not merely implement specific BMPs), that can potentially lead to achieving environmental targets *with reduced costs*.

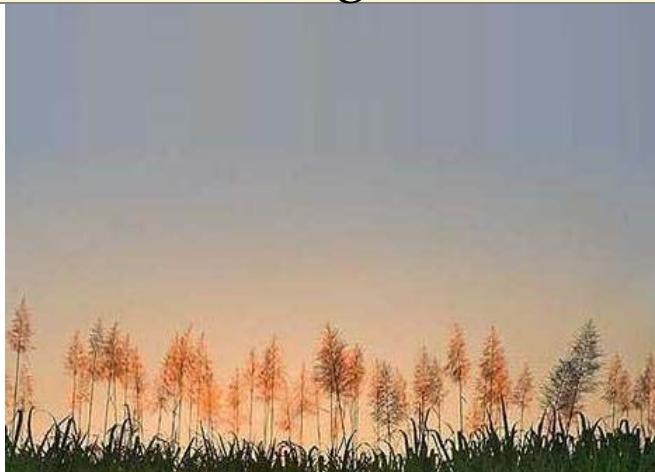


Agricultural Eco-Services

- Minuses
 - Markets not fully developed
 - Existing regulations may prevent ag producers from selling their services
 - Cost-sharing
 - Mandatory BMPs that include these services
 - Consumptive Use Permits competing with water storage service
 - Environmental services accounting not fully developed
 - Initially, high transaction costs, monitoring, inspections, legal protection are cautions

Agricultural Eco-Services

- Other considerations:
 - Is it a tax system or a services system?
 - Who cares if you earn the revenue honestly?!
 - Risk of damage to traditional commodity
 - New farming practices are required to minimize this risk
 - For example, selecting sugar cane tolerant of high water tables



What counts and how do I measure it?

- Other considerations:
 - Groundwater recharge means prolonged base flow (minimum flows and levels)
 - *Unknown: Can we use models, estimates from research, actual measurements?*
 - Water storage means less flashy discharge/drainage and less impact on the estuarine and riverine systems
 - *Unknown: Could be provided by WMD or other local agencies already recording this info?*
 - Dispersed systems are safer in ag settings and provide these services where agriculture can use the products

Summary

- We are at the ground floor for eco-systems services
- Considerable details involved in market development
- Potential for integrated farming systems:
 - Reduces risks to current or planned commodity
 - May provide for alternative income streams
- Humans need to work together exploring:
 - Water issues (CUP, ERP,???)
 - Water treatment (utilities AND agriculture?)
- All humans are involved in the TMDL/BMAP process, so working for a win-win is smart





Thanks for listening...

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