# Dispersed Water Management Activities
# St. Lucie Estuary Watershed
# Rivers Coalition Meeting
# March 21, 2013

**Boyd Gunsalus, Lead Environmental Scientist**
**South Florida Water Management District**

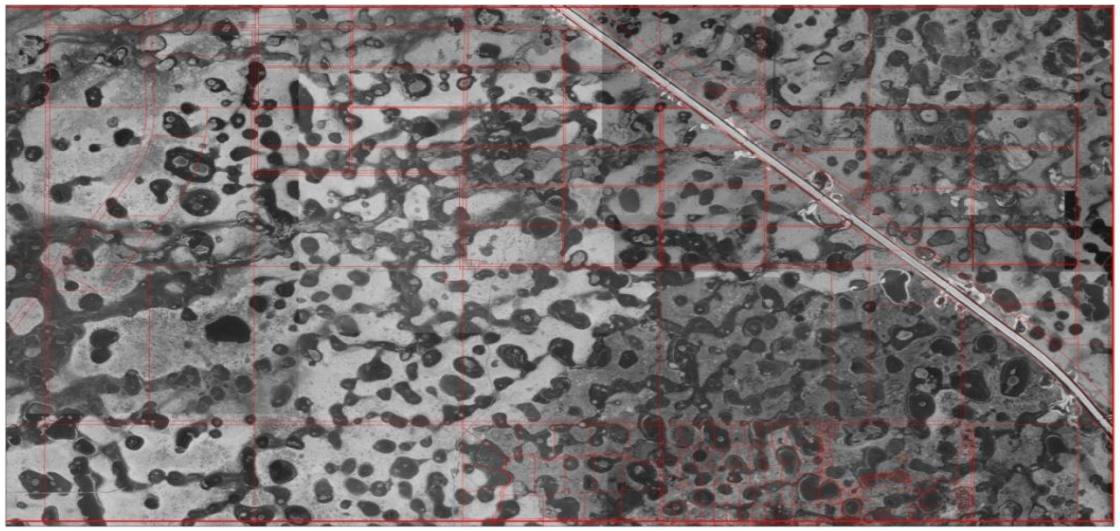
# Dispersed Water Management

**Definition:**

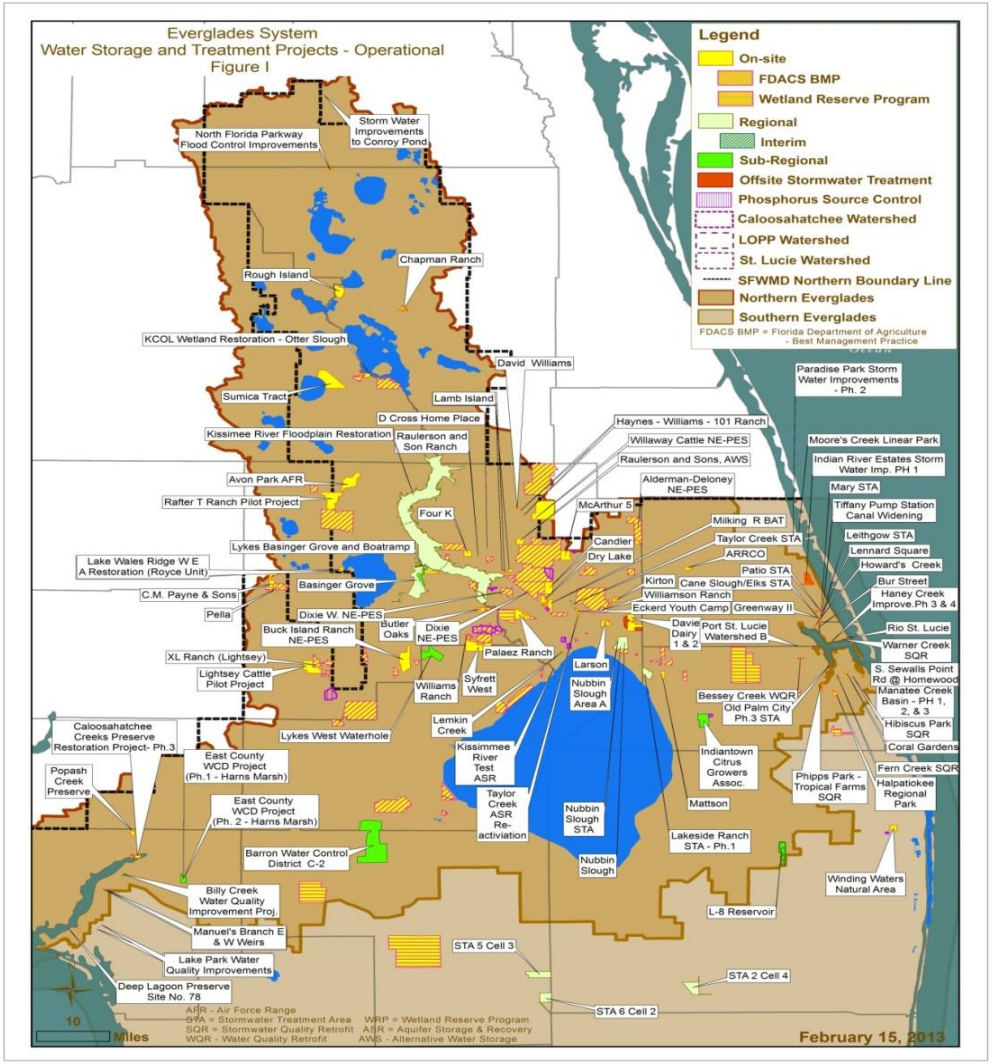
**Shallow water distributed across watershed landscapes using relatively simple structures**

# Why do Dispersed Water Management?

Nine Gems
2006 and 1958 Aerial Imagery



# Overall Operational Projects Map




- Operational projects since 2005 for all areas/entities
- 143,061 ac-ft
- Operational projects since 2005 associated with the DWM program
- 61,261 ac-ft

# Dispersed Water Management Projects
# St. Lucie Watershed Overview


- **Allapattah Flats (Hydrologic Restoration)**
  - Williamson Ranch (533 acres)
  - Turnpike Dairy (96 acres)
  - Parcels A & B (12,725 acres)
  - Parcel C (6,142 acres)
- **C-23/C-24 Reservoir & STA Complex**
  - North Reservoir (2,800 acres)
  - South Reservoir (6,200 acres)
  - Stormwater Treatment Area (2,900 acres)
- **Harbour Ridge Property Owners Assoc.**
  - Retain excess discharges from C-23 (95 acres wetlands/lakes)
- **Water Farming**
  - Pilot Projects on Fallow Citrus Lands

# Indian River Lagoon South Recommended Plan

## C-44 Basin Components

1 C-44 - Reservoir
2 C-44 - Stormwater Treatment Area(East)
3 C-44 - Stormwater Treatment Area(West)
4 Palmar Complex - Natural Storage and Water Quality Area

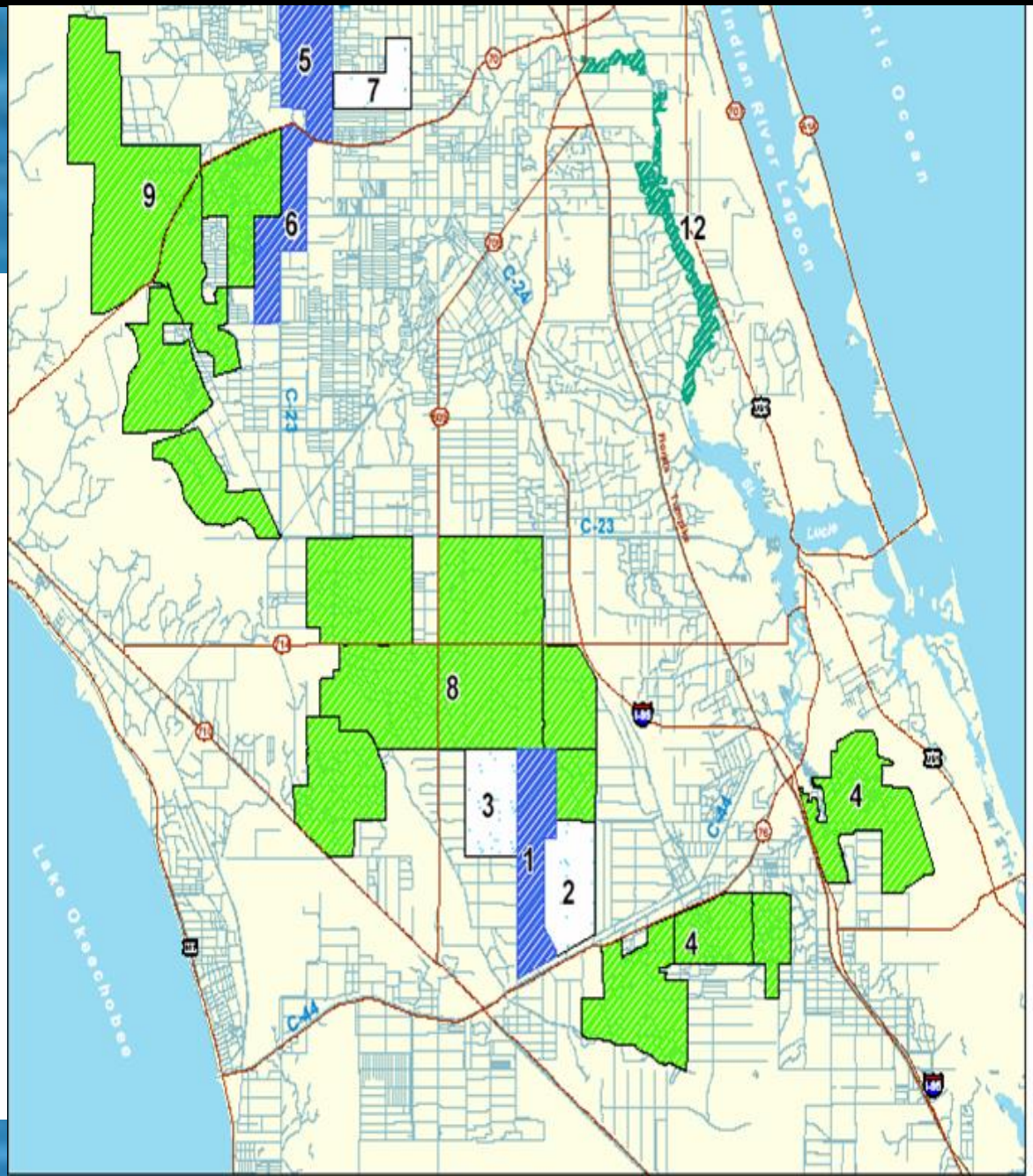
## C-23/24 Basin Components

5 C-23/C-24 - North Reservoir
6 C-23/C-24 - South Reservoir
7 C-23/C-24 - Stormwater Treatment Area
8 Allapattah - Complex Natural Storage and Water Quality Area
9 Cypress Creek/Trail Ridge Complex - Natural Storage and Water Quality Area

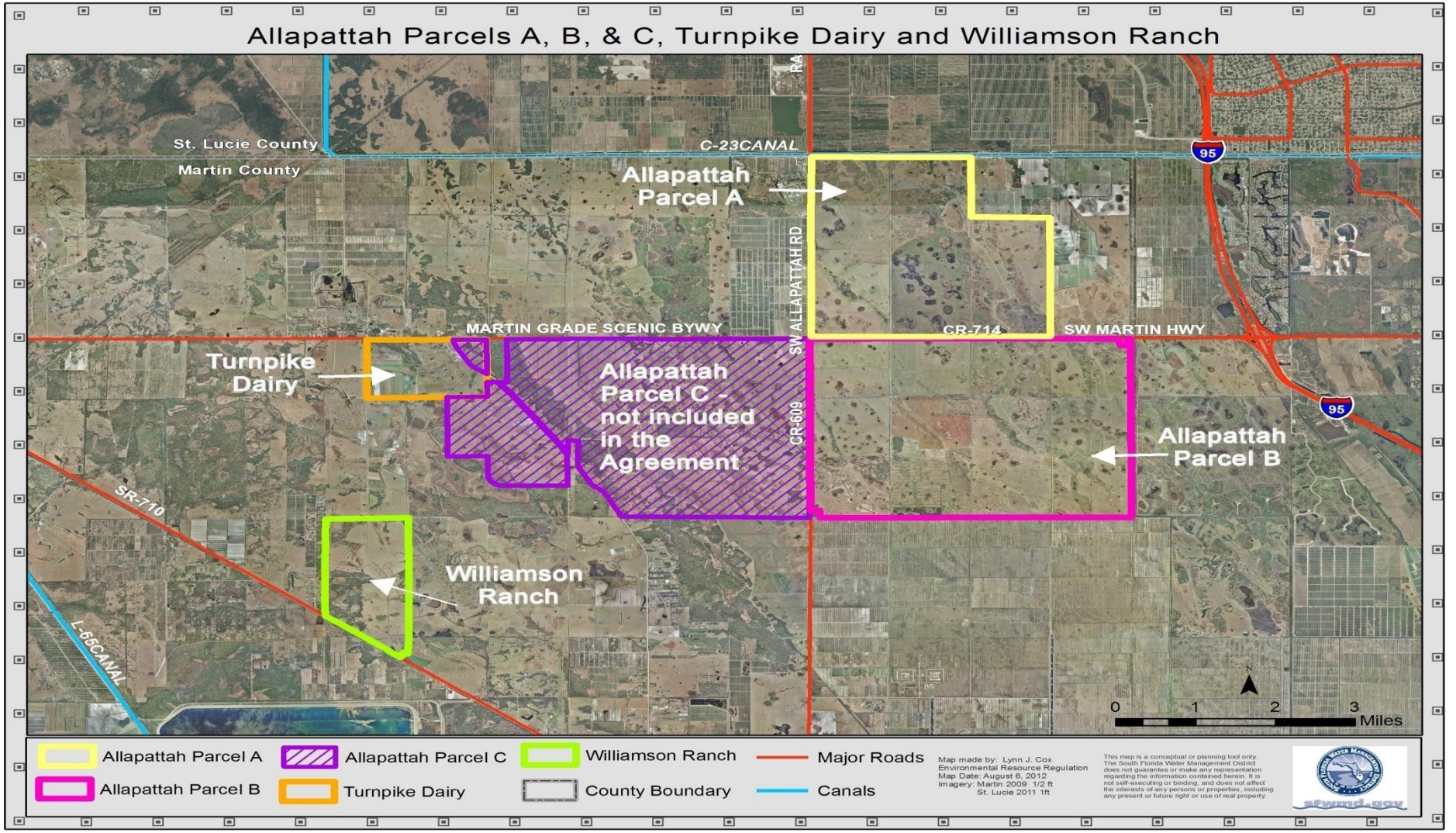
## C-25, Northfork and Southfork Basin Components

10 C-25 - Reservoir
11 C-25 - Stormwater Treatment Area
12 Northfork Natural Floodplain Restoration
13 Muck Remediation and Artificial Habitat

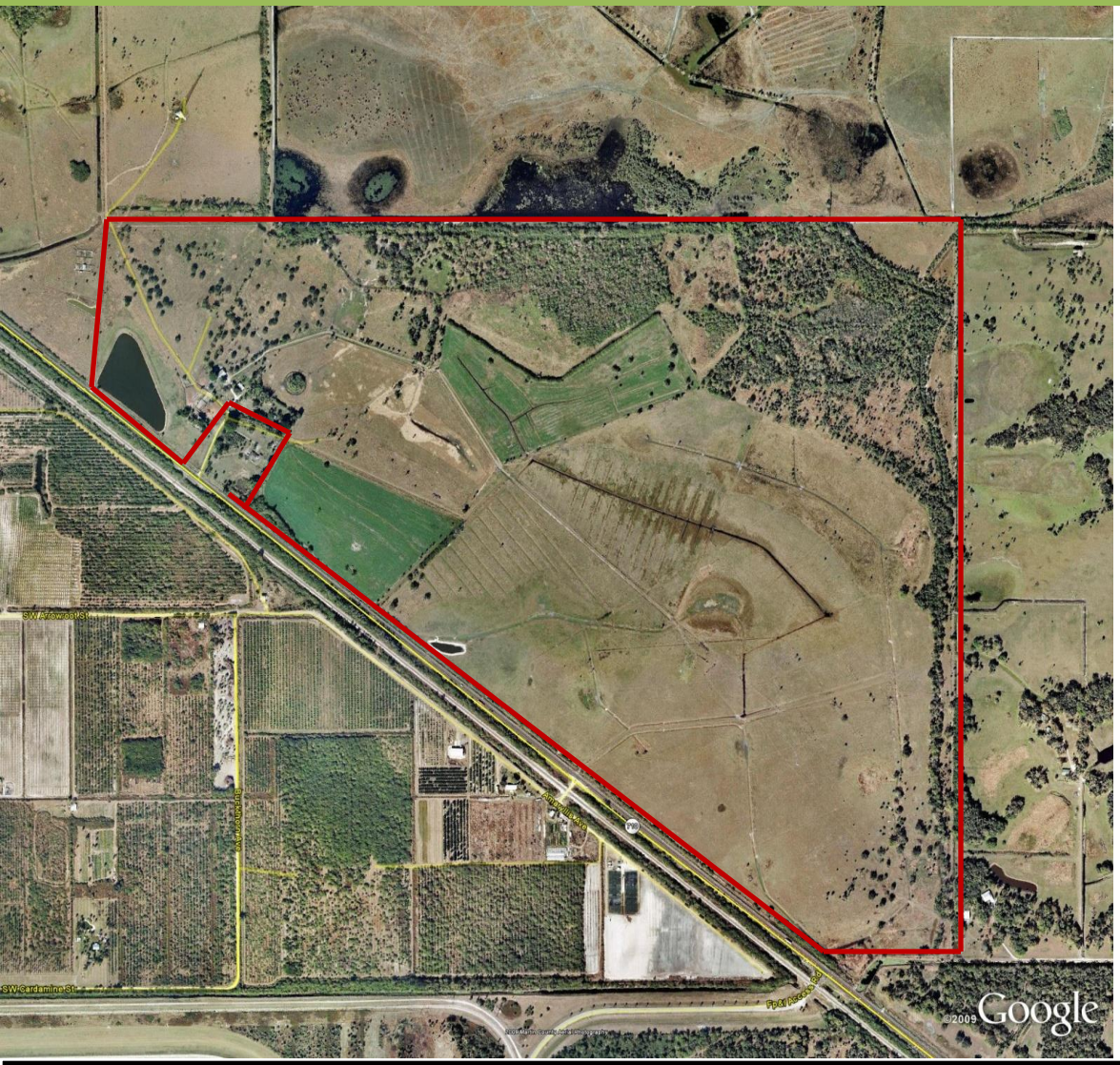
Natural Floodplain Restoration
Natural Storage and Water Quality Area
Reservoir
Stormwater Treatment Area



# Allapattah Flats Complex



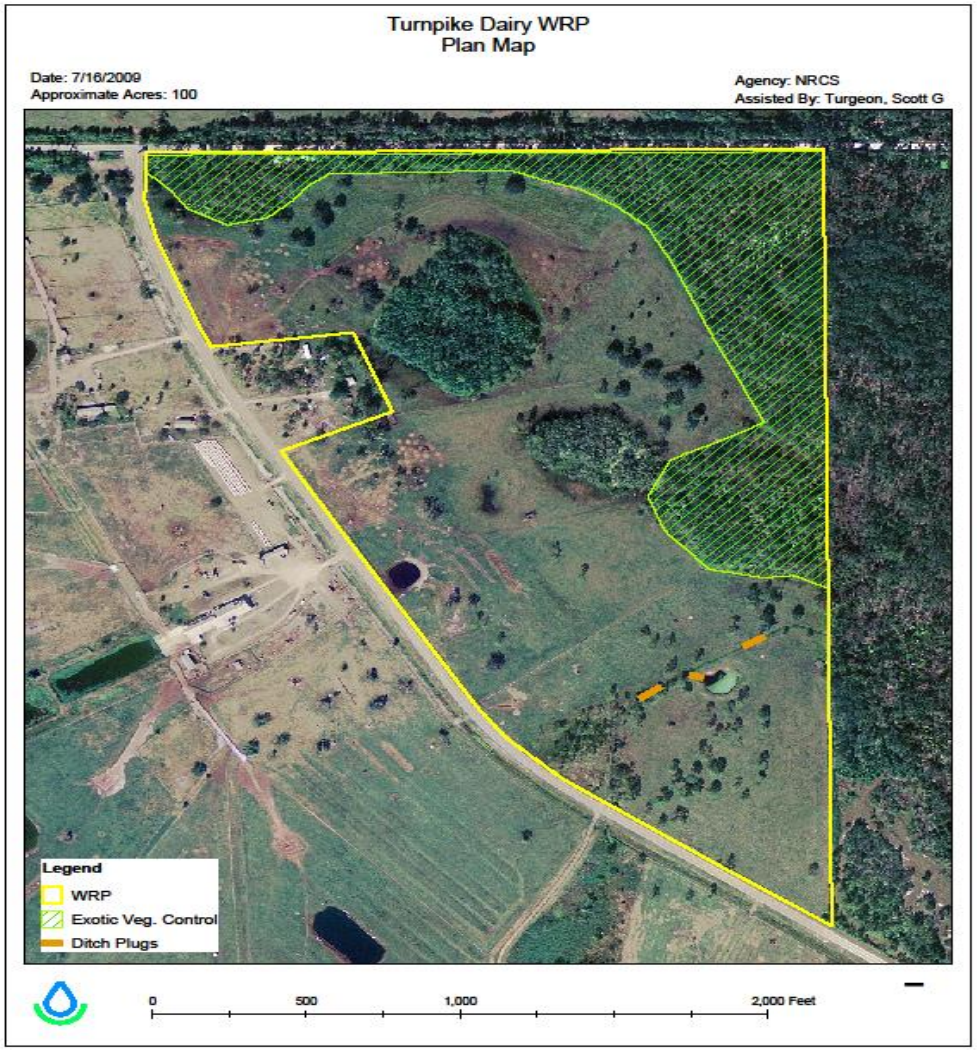
# Allapattah – Williamson Ranch




- 533 acres
- Goal: Hydrologic Restoration
- 100% Reimbursement NRCS-WRP
- Construction Start Date: 3/18/13
- Anticipated Completion: June 2013
- 28 Ditch Plugs
- 3 Water Control Structures

# Williamson Ranch

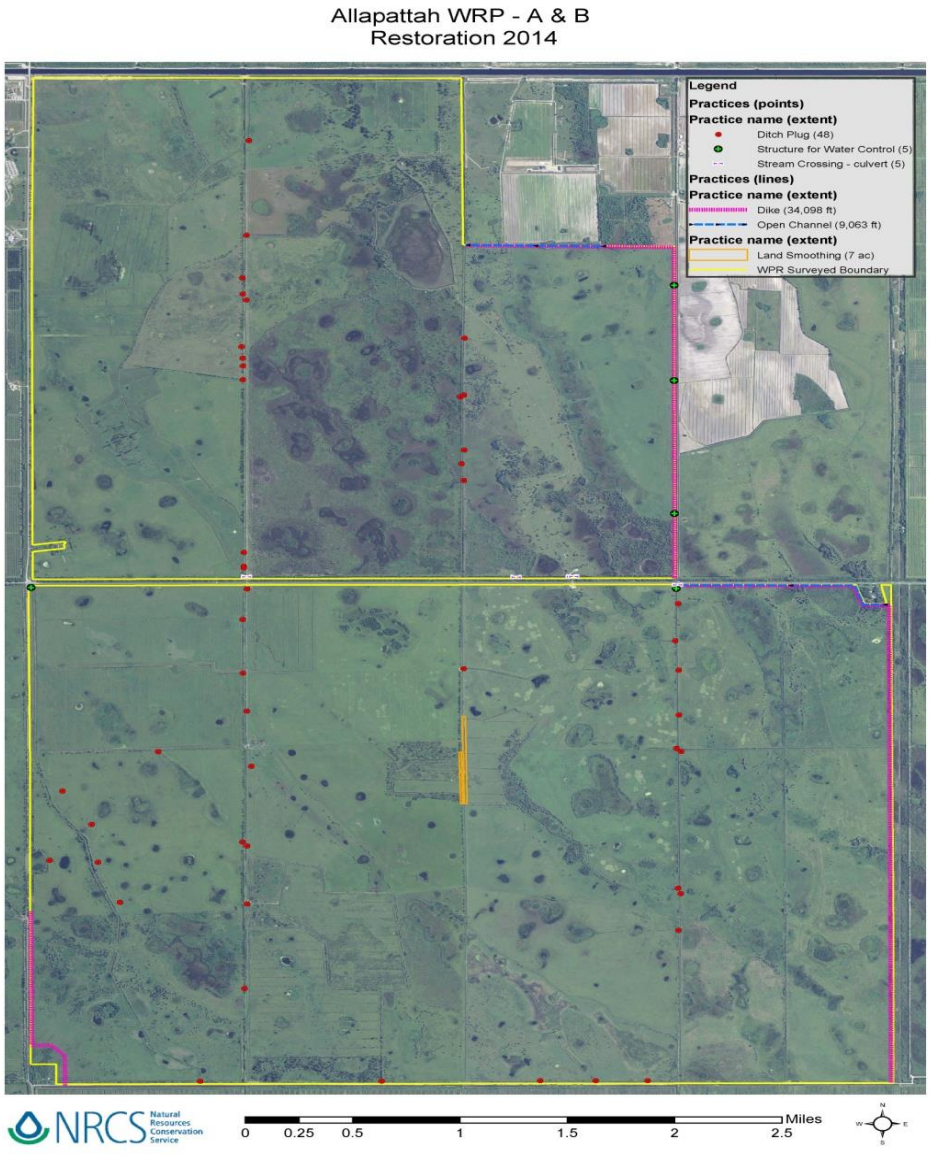
# Allapattah – Turnpike Dairy




- 96 acres
- Goal: Hydrologic Restoration
- 100% Reimbursement NRCS-WRP
- Construction Start Date: 4/13
- Anticipated Completion: 6/13
- 2 Ditch Plugs
- Exotic & Nuisance Plant Eradication: 4/13
- Turnpike & Williamson: $700,000

# Allapattah -Turnpike Dairy

# Allapattah Parcels A & B

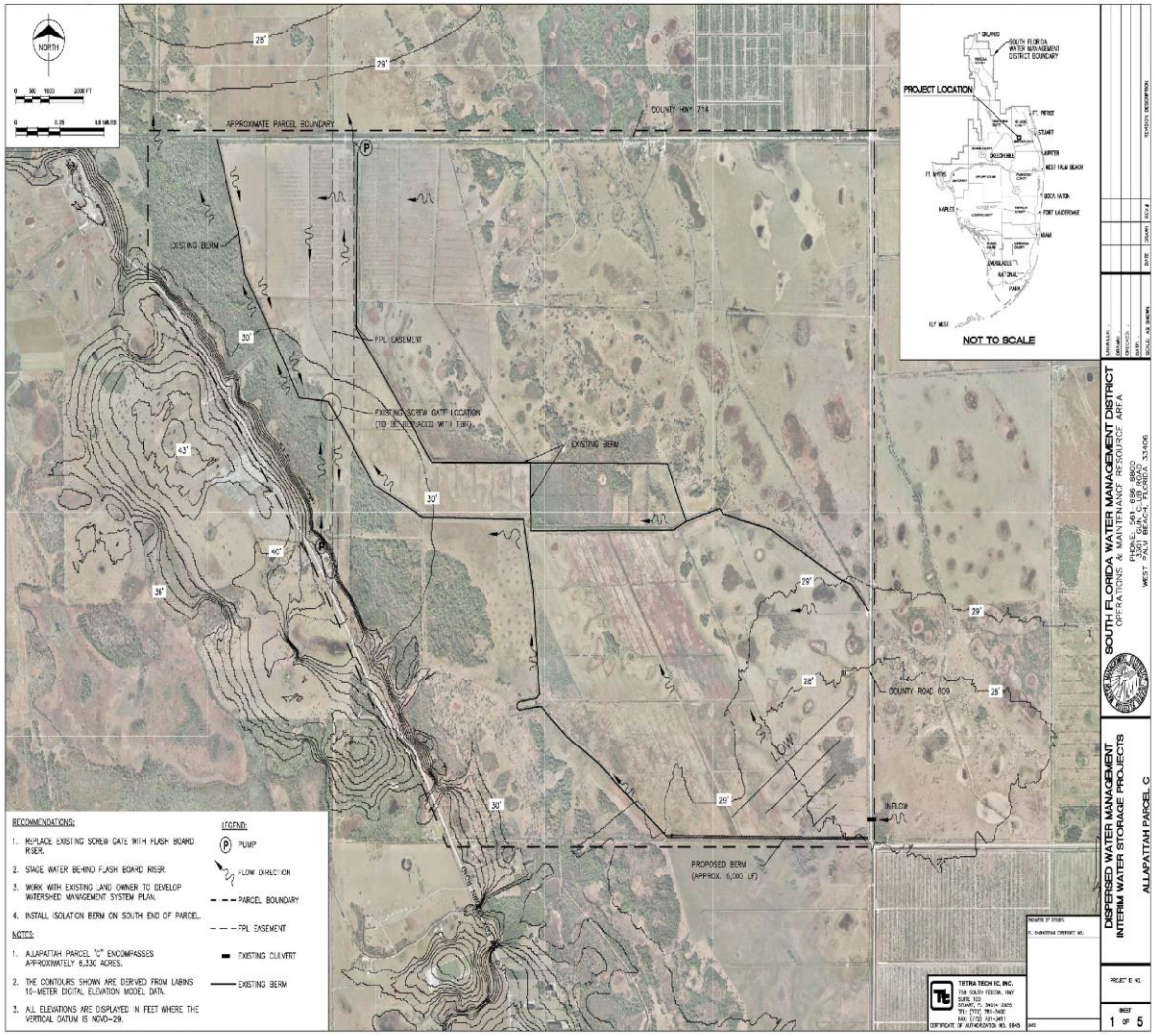



- 12,725 acres
- Agreements with NRCS for WRP projects
- Design/permitting by NRCS with District Coordination
- Construction by District with 100% NRCS reimbursement
- Anticipated Construction Start Date: Nov./Dec. 2013
- Anticipated Completion Date: prior to 12/31/15
- Exotic & Nuisance Plant Eradication: 4/13
- Allapattah A&B: $3,000,000

# Allapattah Parcel A- Riser Culvert Installation

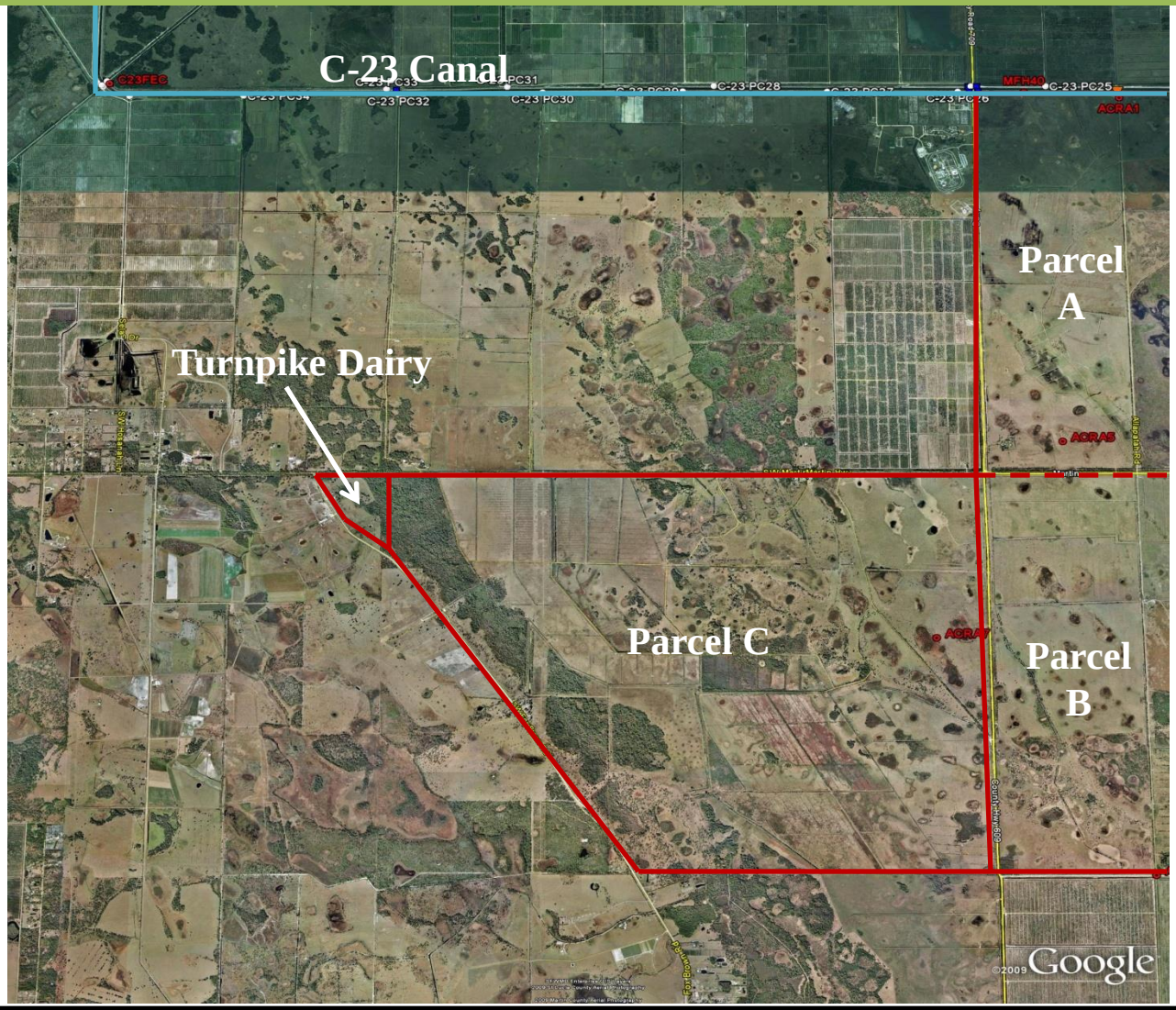

# Allapattah Parcel A – Pre & Post TS Isaac


# Allapattah Parcel C

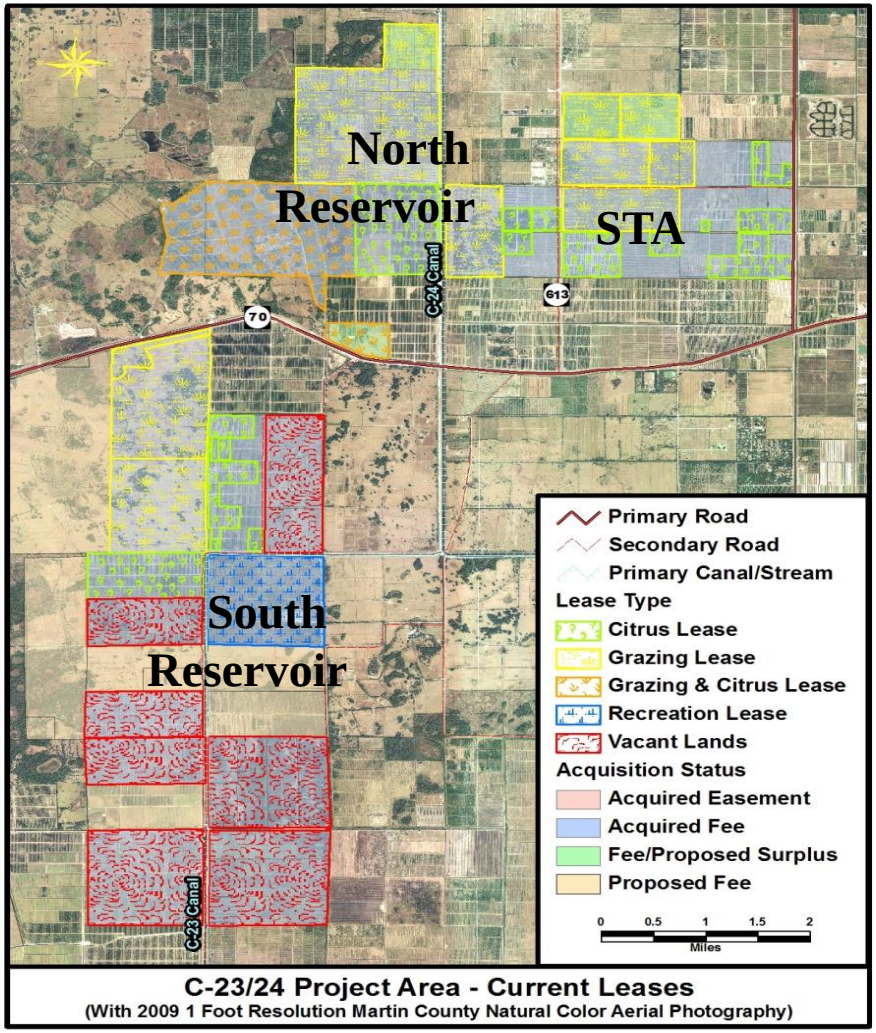



- Goal: Hydrologic Restoration
- Coordination w/Lessee
- Anticipated Start: 4/13
- Anticipated Completion: 6/13
- 6,142 acres

# Allapattah Parcels A, B, C & Turnpike Dairy



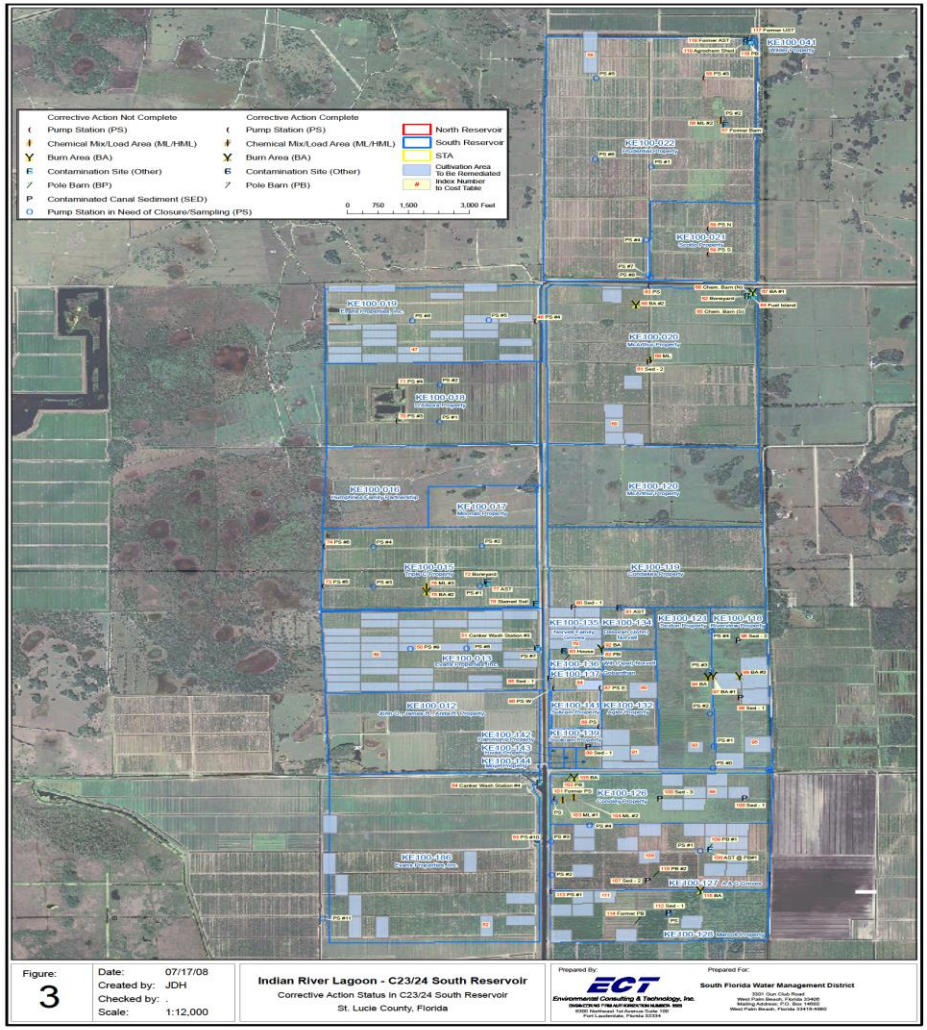
# C-23/C-24 Reservoir & STA Complex




C-23/24 Project Area - Current Leases
(With 2009 1 Foot Resolution Martin County Natural Color Aerial Photography)

- Working on District land to retain water within citrus parcels by adding boards to riser culvert structures
- North Reservoir: appox. 2800 acres
  - Added 190 ac/ft over 300 acres
  - Working on 1,000 acres
- South Reservoir: approx. 6200 acres
  - Copper Field Study
- Stormwater Treatment Area: approx. 2900 acres
  - Working on additional areas

# C-23/C-24 South Reservoir

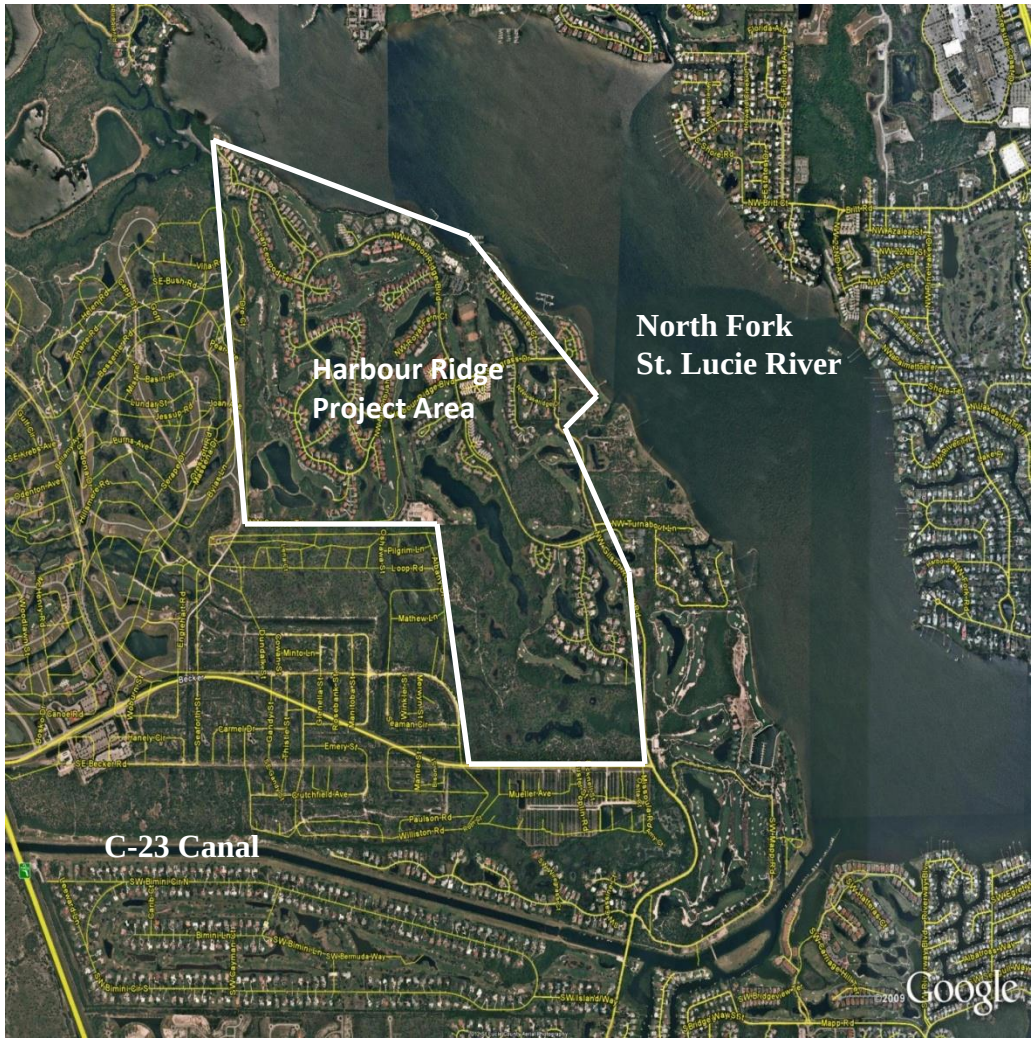



- **Working with Agrochemical threshold limits**
- **Prioritize activities in areas with minimal Agrochemical impacts**
- **Identify remedial measures for future activities within project footprint**

# C-23/C-24 North Reservoir


- **Implemented Dispersed Water Mgmt activities on 300 acres fallow citrus**
  - **Added 190 ac/ft of additional retention**
  - **Working on an additional 1,000 acre area**

# Harbour Ridge Property Owners Association




- **Total Area: approx. 1000 acres**
  - **95 acres Lakes/Wetlands**
- **Goal: retain excess discharges from C-23 Canal within on-site lakes and wetlands**
- **One time 50/50 cost share**
- **Estimated 650 ac/ft annual retention**

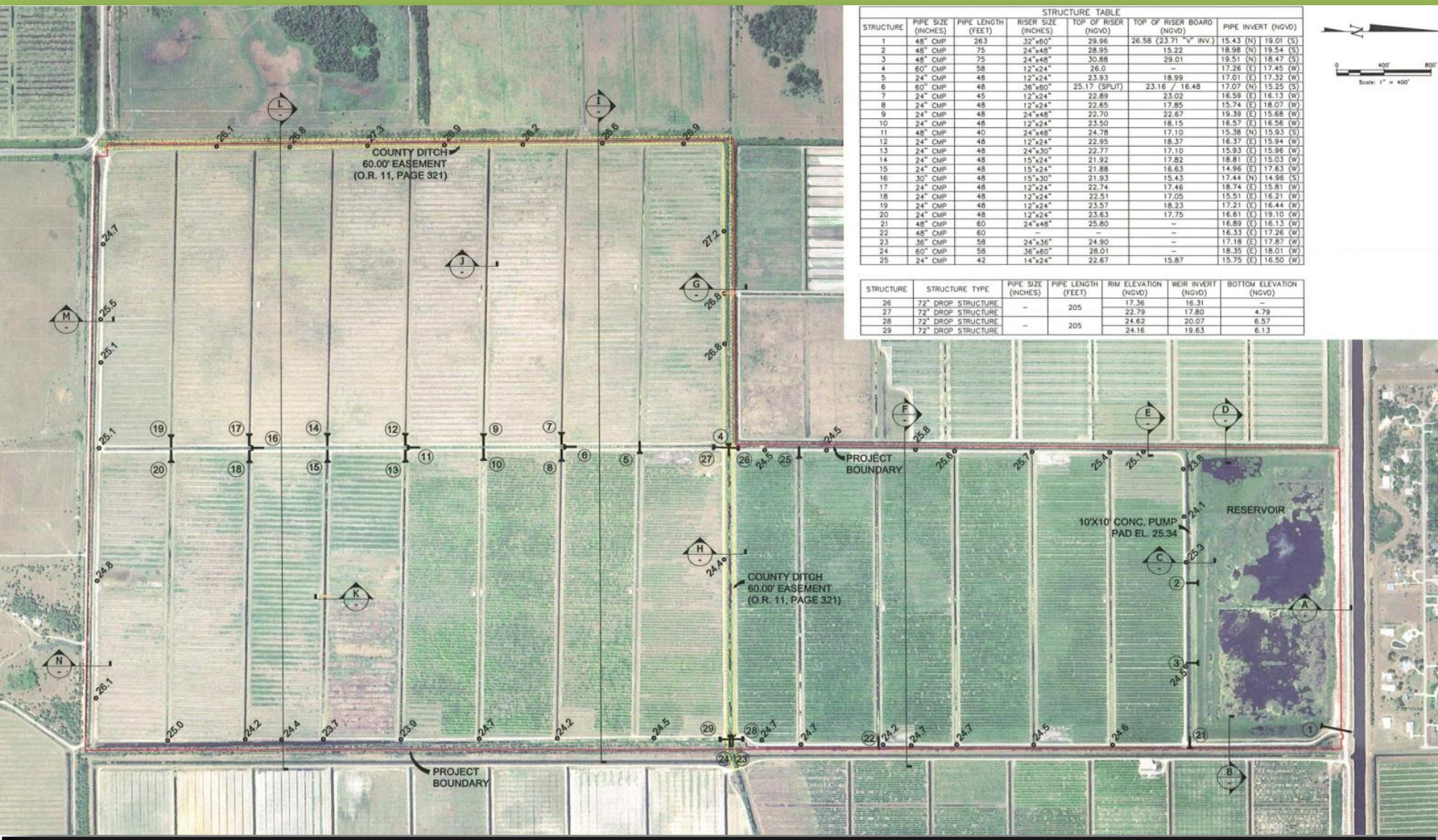
# Water Farming
# Agricultural Cropland Assessment Project

**CONCEPT:** Fallow citrus lands to store water, attenuate nutrients, utilize stormwater as an alternative water supply to reduce releases, and improve water quality to the St. Lucie and Caloosahatchee Estuaries

- Cooperative Agreement executed with Indian River Citrus League and the Gulf Citrus Growers Association

- Feasibility evaluation of costs and benefits (**2 Alternatives evaluated**)


# Water Farming Assessment Project



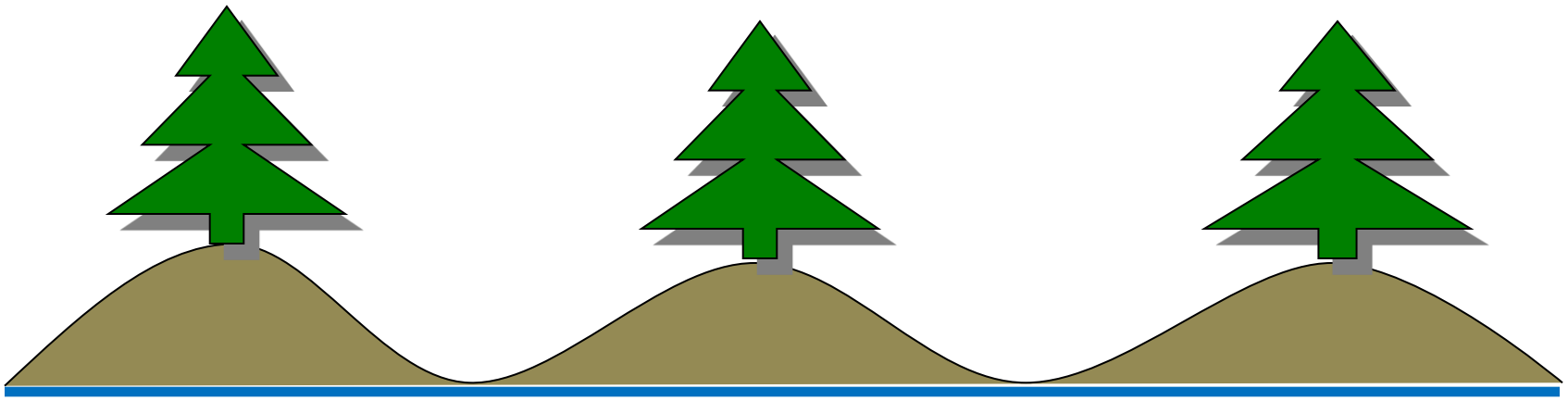

STRUCTURE TABLE

| STRUCTURE | PIPE SIZE (INCHES) | PIPE LENGTH (FEET) | RISER SIZE (INCHES) | TOP OF RISER (NGVD) | TOP OF RISER BOARD (NGVD) | PIPE INVERT (NGVD) |
|---|---|---|---|---|---|---|
| 1 | 48" CMP | 263 | 32"x60" | 29.96 | 26.58 (23.71 "V" INV.) | 15.43 (N) 19.01 (S) |
| 2 | 48" CMP | 75 | 24"x48" | 28.95 | 15.22 | 18.98 (N) 19.54 (S) |
| 3 | 48" CMP | 75 | 24"x48" | 30.88 | 29.01 | 19.51 (N) 18.47 (S) |
| 4 | 60" CMP | 58 | 12"x24" | 26.0 | – | 17.26 (E) 17.45 (W) |
| 5 | 24" CMP | 48 | 12"x24" | 23.93 | 18.99 | 17.01 (E) 17.32 (W) |
| 6 | 60" CMP | 48 | 36"x60" | 25.17 (SPLIT) | 23.16 / 16.48 | 17.07 (N) 15.25 (S) |
| 7 | 24" CMP | 45 | 12"x24" | 22.89 | 23.02 | 16.59 (E) 16.13 (W) |
| 8 | 24" CMP | 48 | 12"x24" | 22.65 | 17.85 | 15.74 (E) 18.07 (W) |
| 9 | 24" CMP | 48 | 24"x48" | 22.70 | 22.67 | 19.39 (E) 15.68 (W) |
| 10 | 24" CMP | 48 | 12"x24" | 23.50 | 18.15 | 16.57 (E) 16.56 (W) |
| 11 | 48" CMP | 40 | 24"x48" | 24.78 | 17.10 | 15.38 (N) 15.93 (S) |
| 12 | 24" CMP | 48 | 12"x24" | 22.95 | 18.37 | 16.37 (E) 15.94 (W) |
| 13 | 24" CMP | 48 | 24"x30" | 22.77 | 17.10 | 15.93 (E) 15.96 (W) |
| 14 | 24" CMP | 48 | 15"x24" | 21.92 | 17.82 | 18.81 (E) 15.03 (W) |
| 15 | 24" CMP | 48 | 15"x24" | 21.88 | 16.63 | 14.96 (E) 17.63 (W) |
| 16 | 30" CMP | 48 | 15"x30" | 21.93 | 15.43 | 17.44 (N) 14.96 (S) |
| 17 | 24" CMP | 48 | 12"x24" | 22.74 | 17.46 | 18.74 (E) 15.81 (W) |
| 18 | 24" CMP | 48 | 12"x24" | 22.51 | 17.05 | 15.51 (E) 16.21 (W) |
| 19 | 24" CMP | 48 | 12"x24" | 23.57 | 18.23 | 17.21 (E) 16.44 (W) |
| 20 | 24" CMP | 48 | 12"x24" | 23.63 | 17.75 | 16.61 (E) 19.10 (W) |
| 21 | 48" CMP | 60 | 24"x48" | 25.80 | – | 16.89 (E) 16.13 (W) |
| 22 | 48" CMP | 60 | – | – | – | 16.33 (E) 17.26 (W) |
| 23 | 36" CMP | 58 | 24"x36" | 24.90 | – | 17.18 (E) 17.87 (W) |
| 24 | 60" CMP | 58 | 36"x60" | 28.01 | – | 18.35 (E) 18.01 (W) |
| 25 | 24" CMP | 42 | 14"x24" | 22.67 | 15.87 | 15.75 (E) 16.50 (W) |

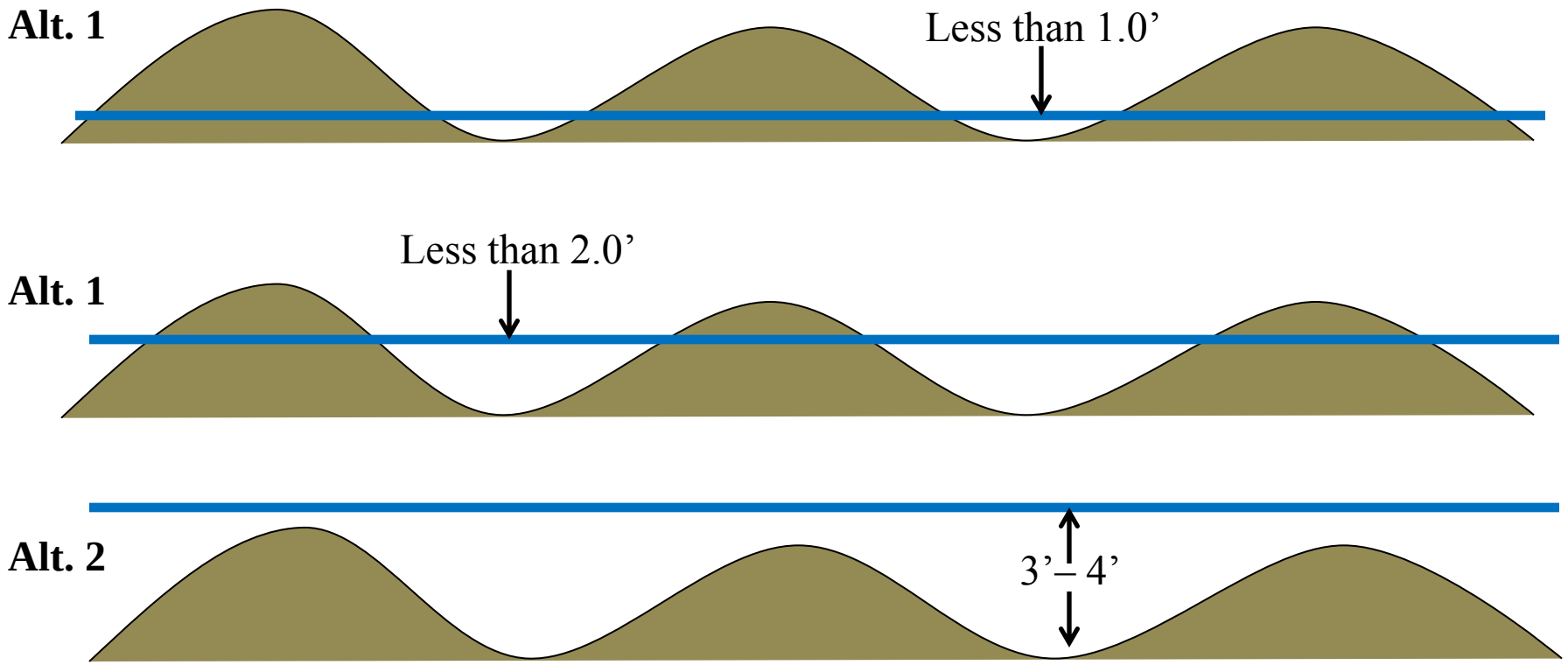
| STRUCTURE | STRUCTURE TYPE | PIPE SIZE (INCHES) | PIPE LENGTH (FEET) | RIM ELEVATION (NGVD) | WEIR INVERT (NGVD) | BOTTOM ELEVATION (NGVD) |
|---|---|---|---|---|---|---|
| 26 | 72" DROP STRUCTURE | – | 205 | 17.36 | 16.31 | – |
| 27 | 72" DROP STRUCTURE | | | 22.79 | 17.80 | 4.79 |
| 28 | 72" DROP STRUCTURE | – | 205 | 24.62 | 20.07 | 6.57 |
| 29 | 72" DROP STRUCTURE | | | 24.16 | 19.63 | 6.13 |

# Typical Fallow Citrus Area

# Citrus Bed & Furrow Cross-section with typical Groundwater Level

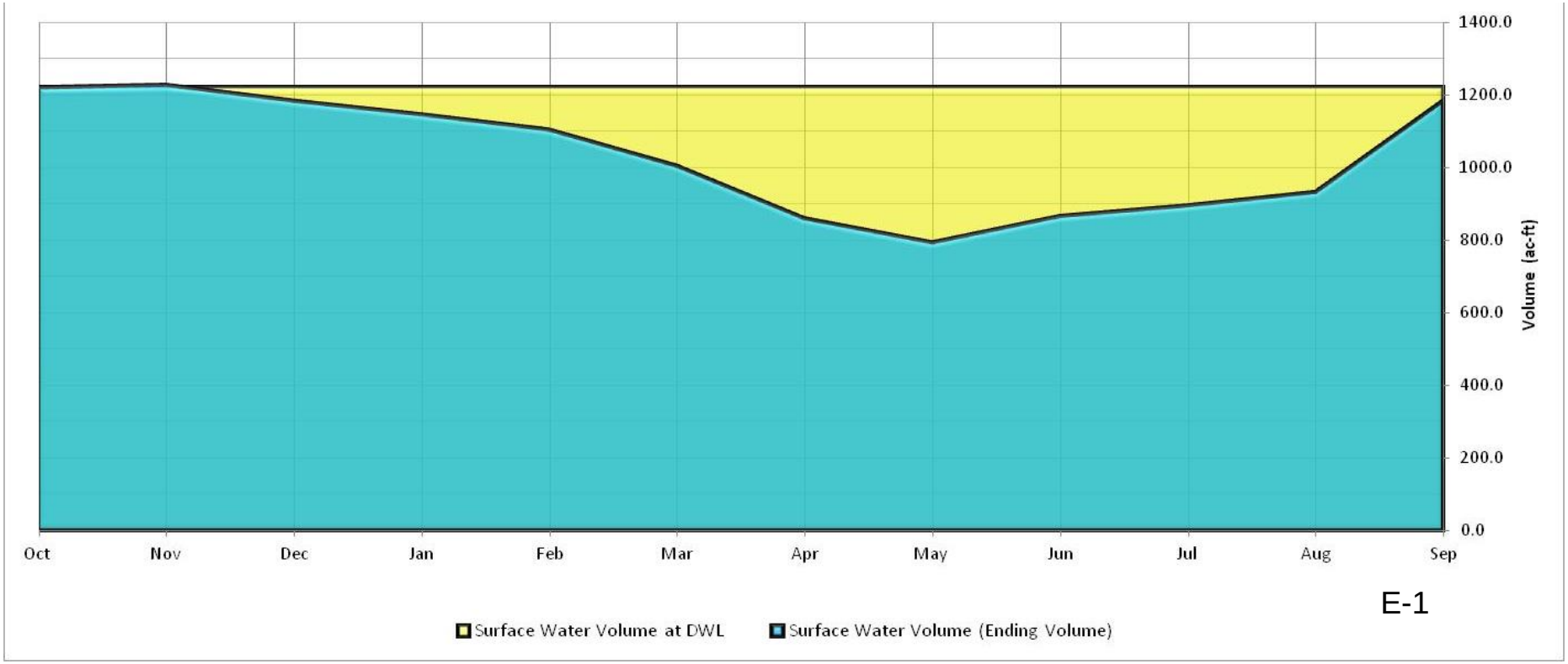


# Alternatives
# Fallow Citrus Cross-section with proposed Surface Water Levels



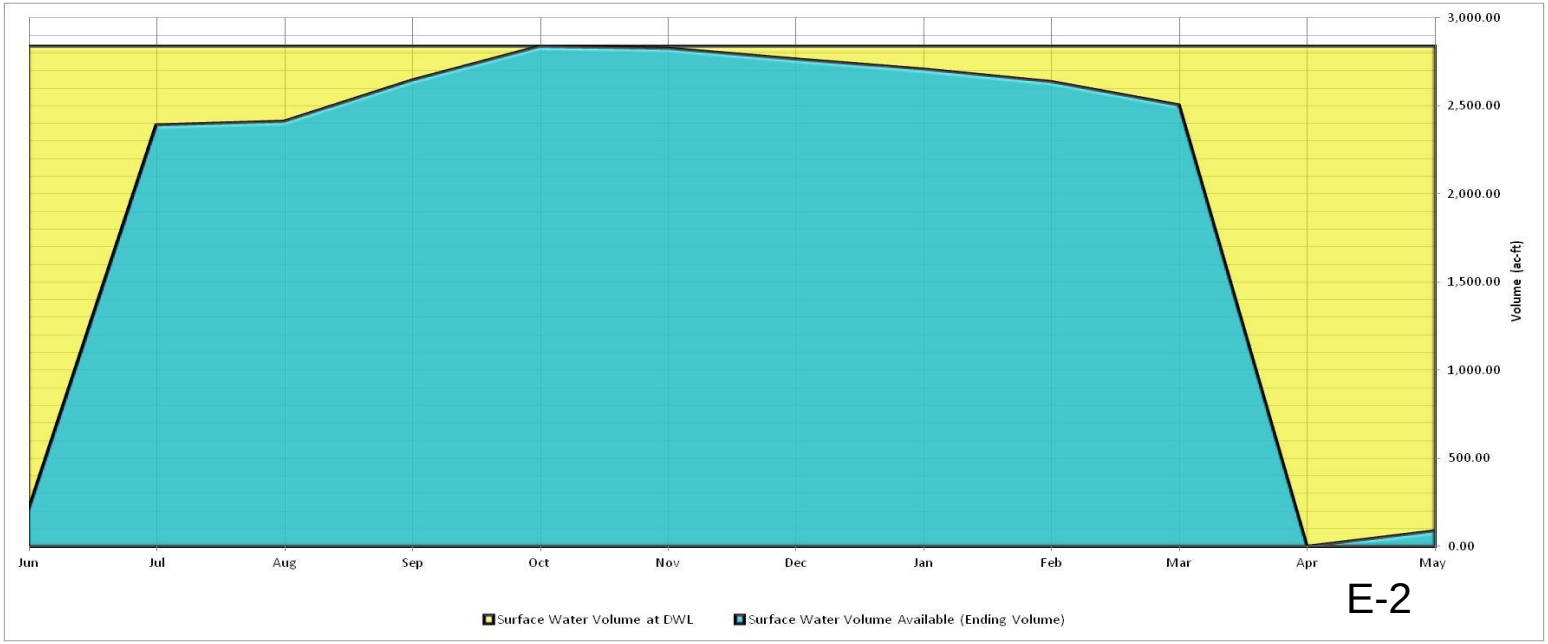
# Water Farming Assessment Project

- **Alternative #1 – Retention on farm site**
  - **Optimize existing farm infrastructure / limited capital investment**
  - **Limited to no discharge / retain onsite rainfall**



# Water Farming Assessment Project

- **Alternative #2 – Storage on farm site**
  - **Improvements to farm infrastructure / impound surface water 2 feet above average crown of bed elevation**
  - **No discharge in wet season**
  - **Capture wet season flows from basin**
  - **Release irrigation water supply to basin in dry season**




E-2

# Water Farming Pilot Projects (Implementation Phase)



- **Enter into agreement with private grove owners**
  - **Competitively develop market based approach to determine future "payment for environmental services"**
  - **Pilot project sites will provide information and data for future program expansion (depending on future funding $$)**
  - **Anticipating entering into Pilot Agreements by April/May 2013**
  - **Pilot program to last 18 – 24 months**

# QUESTIONS