SOUTH FLORIDA WATER MANAGEMENT DISTRICT

OMC VISIONING

• Respond • Retool • Refurbish/Replace • Restore •

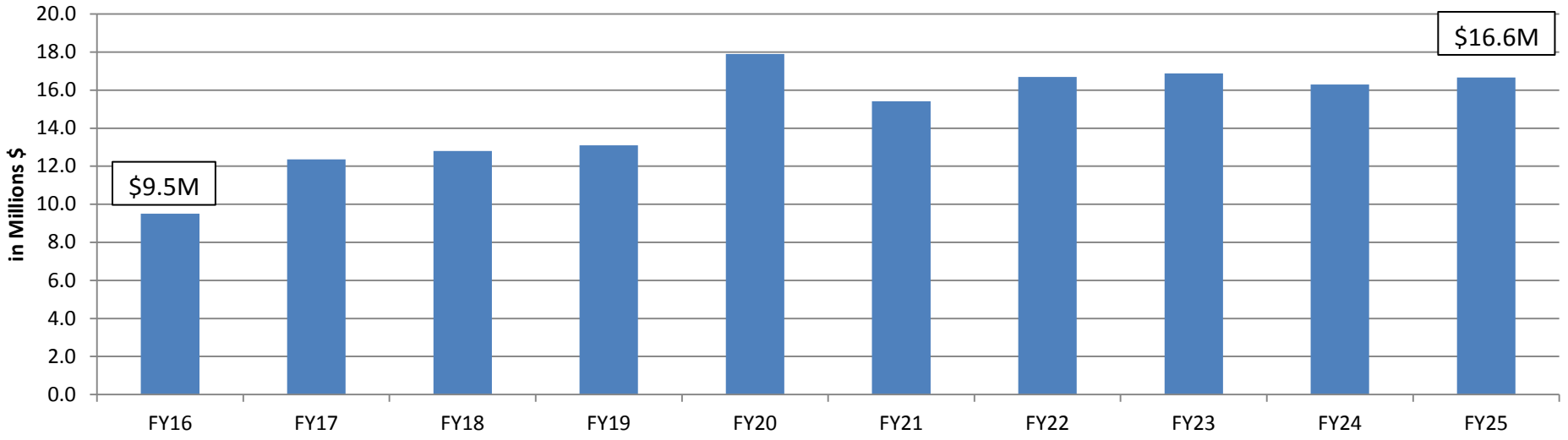
Visioning of Future Infrastructure and OMC Responsibilities

Jeffrey R. Kivett, PE, Division Director
Operations, Engineering & Construction

Governing Board
January 15, 2015

O&M Costs of New Works

Totals nearly $150M over the next 10 years



OMC Goal to reduce the FTE and recurring cost impact of this through strategically positioned capital investments

Visioning Process

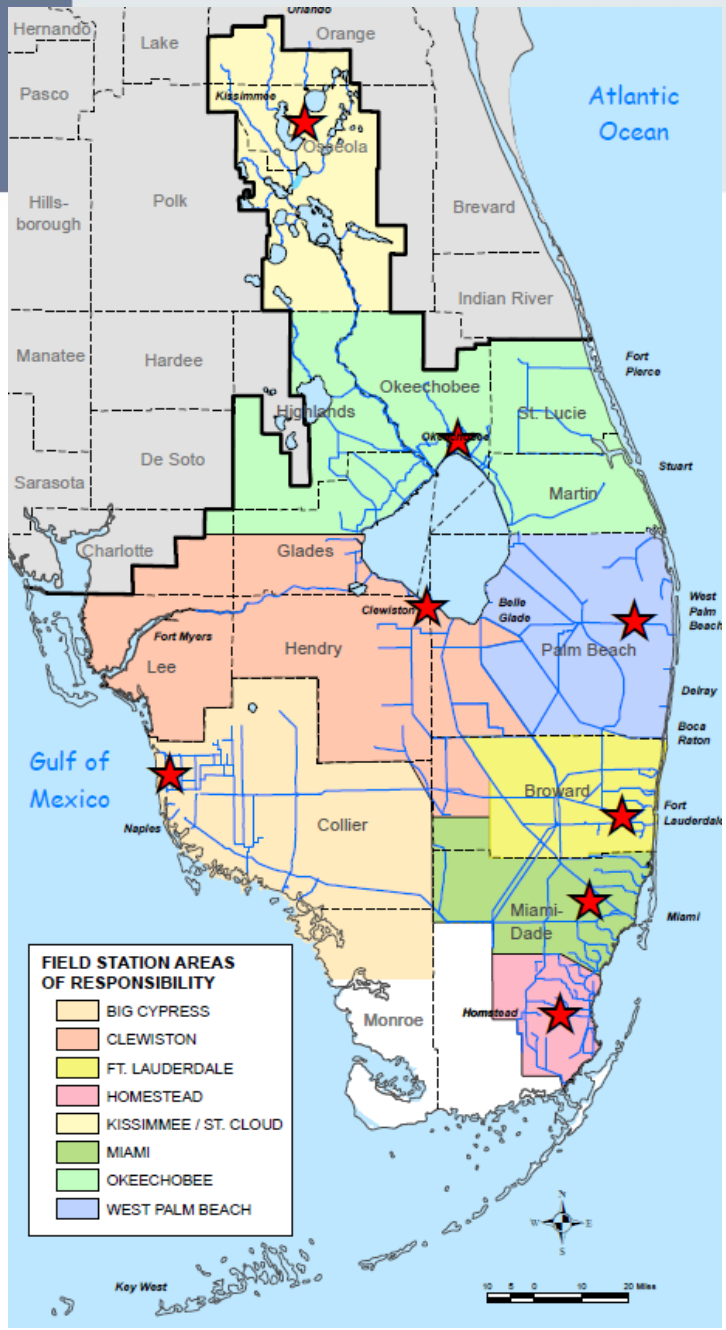
An ongoing, detailed, internal evaluation of OMC Field Operations, focusing on positioning ourselves to efficiently handle the challenges and changes of the next 50 years…

Field Operations Team

Technology Team

Financial Team

Storm / Emergency Response Team

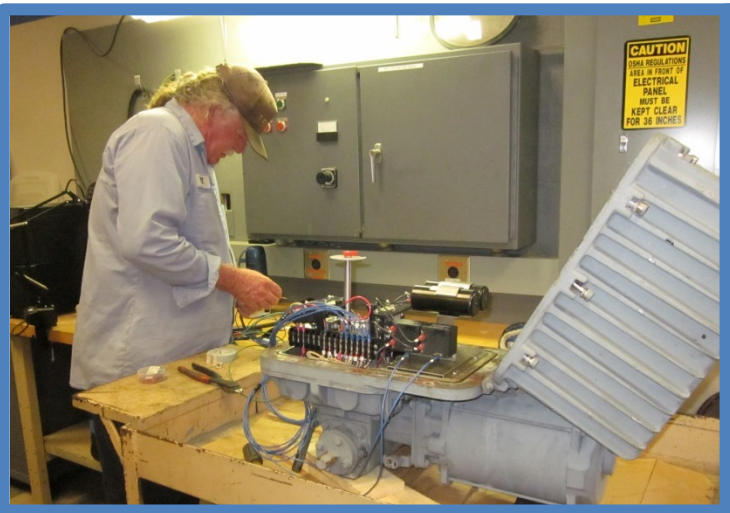


Current Field Station Areas of Responsibility

- **Field Operations – North**
  - St. Cloud
  - Okeechobee
  - Clewiston
  - West Palm Beach
- **Field Operations – South**
  - Ft. Lauderdale
  - Big Cypress
  - Miami
  - Homestead
- Locations are based on 2-hour response time
- Average age of field stations: ***36** years*

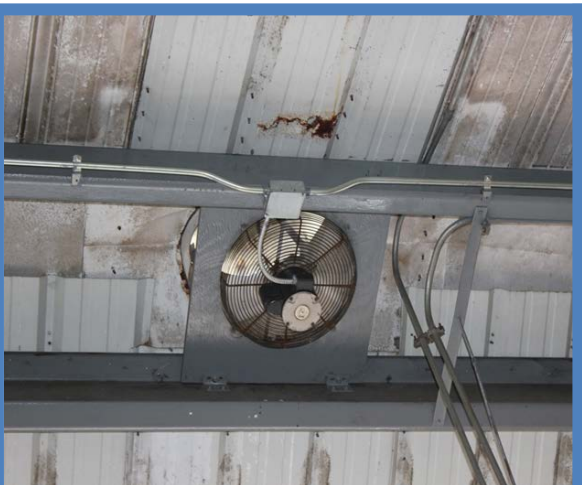
Field Stations – Present

In addition to maintaining critical infrastructure

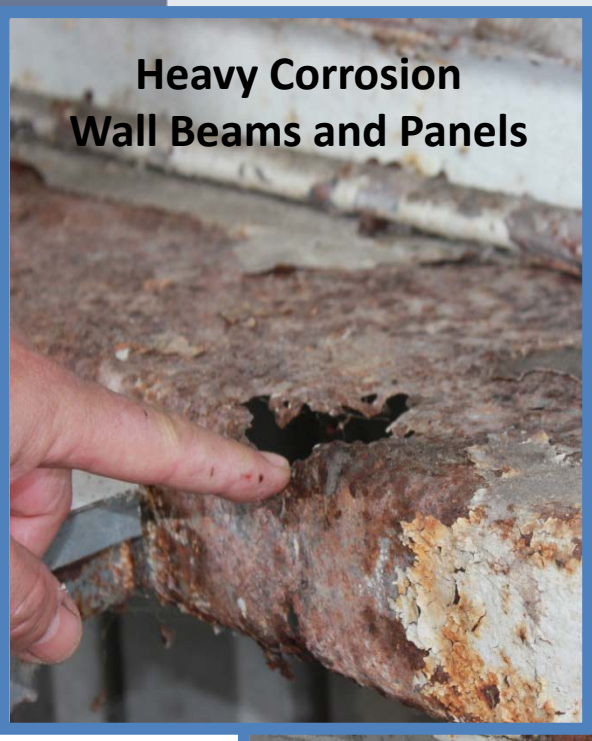


Field Stations – Present

Field Staff also spend time addressing these:



A "Do Nothing Scenario" is Inefficient



A "Do Nothing Scenario" is Inefficient

B33: Inadequate Stores Storage Space

Heavy Corrosion on all main frame ground connections - holes thru Beams

B33: Inadequate Work Space

Future Decisions for Field Stations

Refurbish…

Relocate…

Replace…

Restructure

We are preparing recommendations

OMC VISIONING

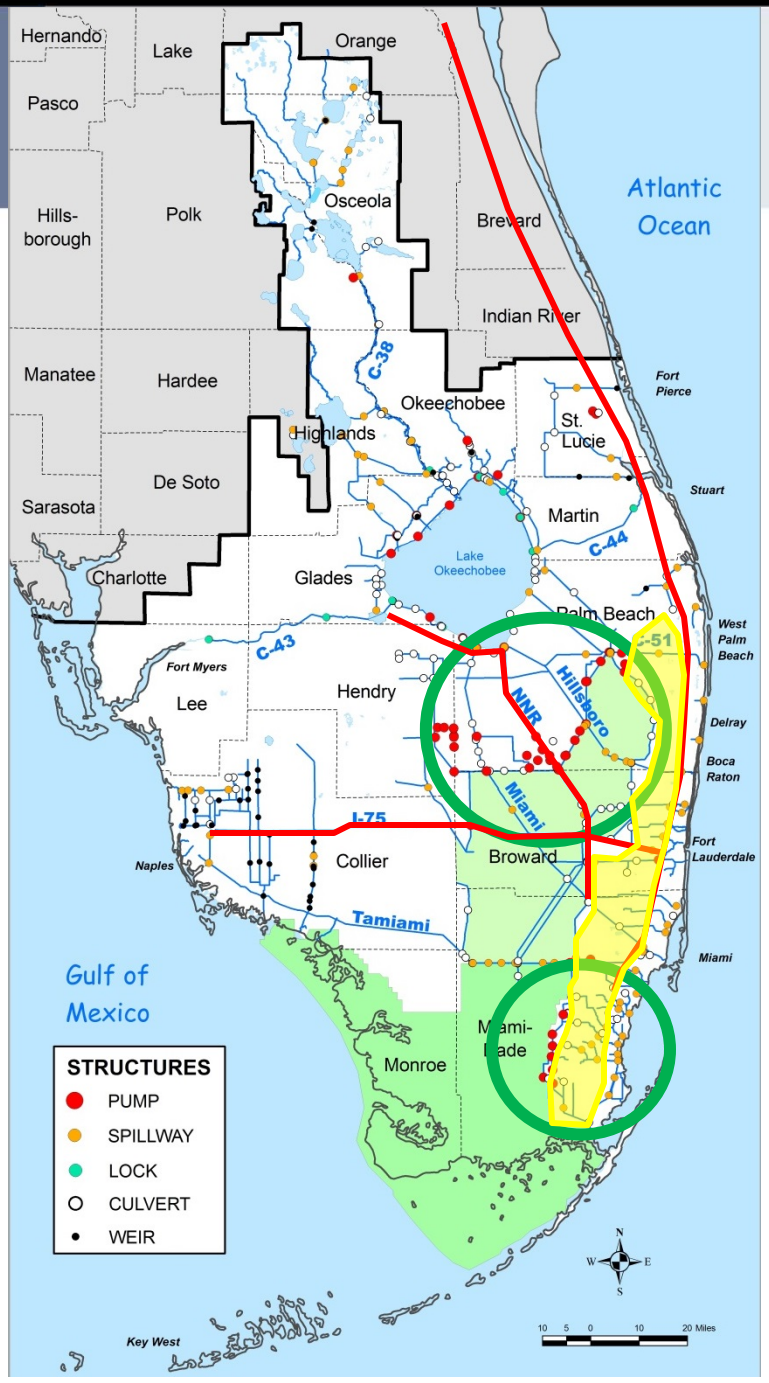
• Respond • Retool • Refurbish/Replace • Restore •

Logistics

(4) 10's improved efficiency, however, instead of this:

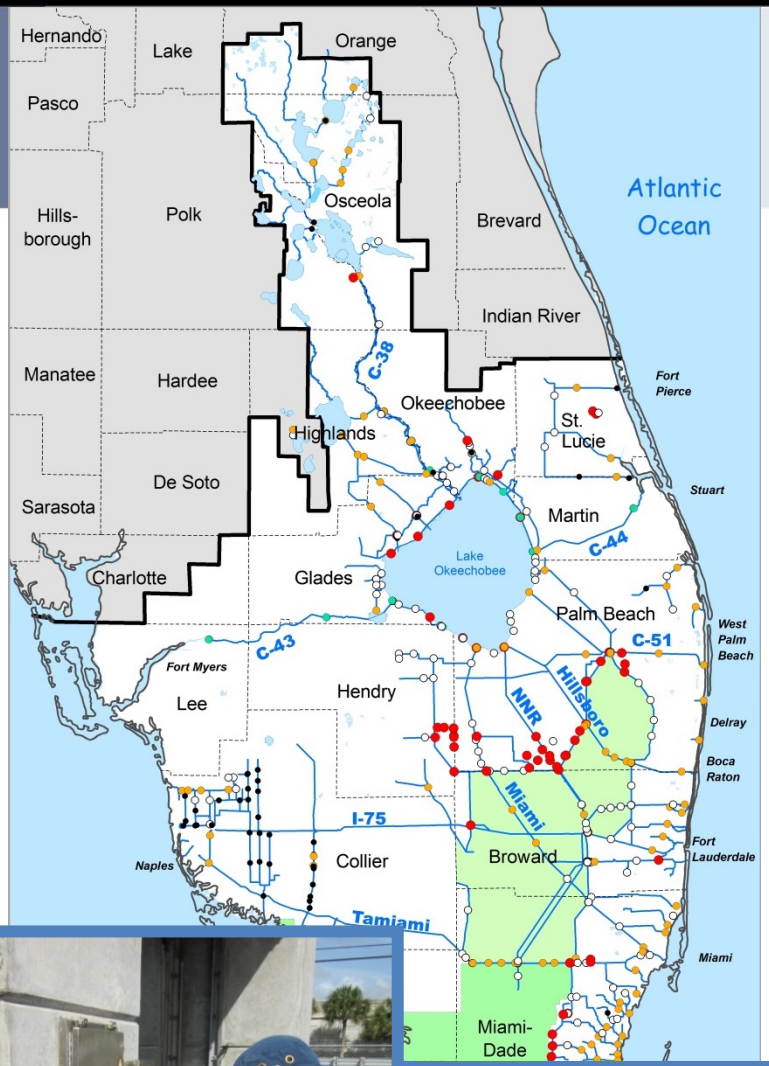
Logistics

48.30 FTE's = time Field Staff still spends seeing this:



Logistics

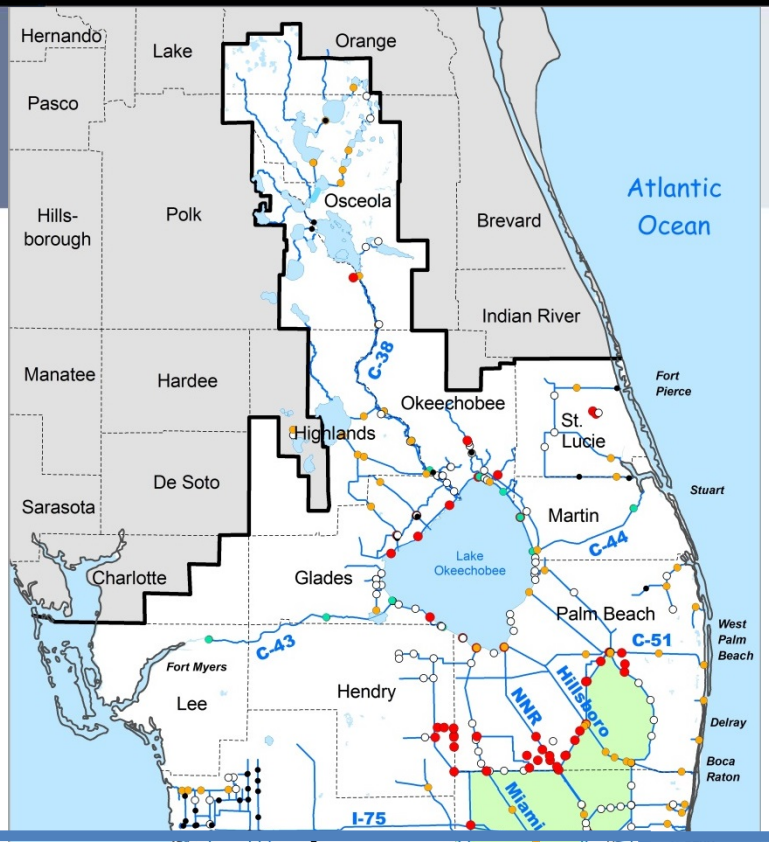
- Technology - Automation
- Infrastructure support
  - I-95, I-75, Sawgrass Exprwy, US27
  - Telemetry communications
  - More robust communications
    - Telephone (Mobile, Sat., etc.)
    - Internet
  - More robust electrical power distribution
- Distribution of new works
  - Remote areas
- Increased risk profile
  - Population growth in poorly drained areas
- Evaluated FPL and others to consider new options



Logistics

Improve materials management

- Centralized Warehousing
  - Separate procurement not needed in every Field Station
  - Overnight deliveries to pickup point
- Real Time / Mobile Platform for Work Order Entry
  - Start the day where the work is not at Field Station

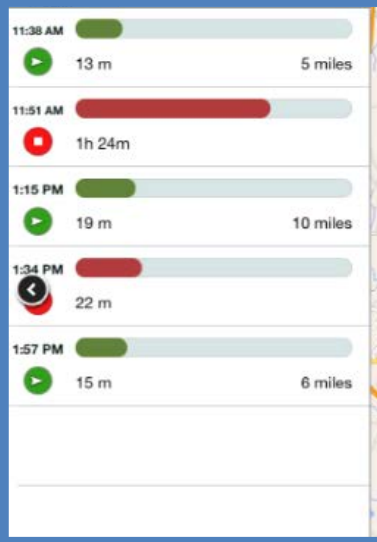


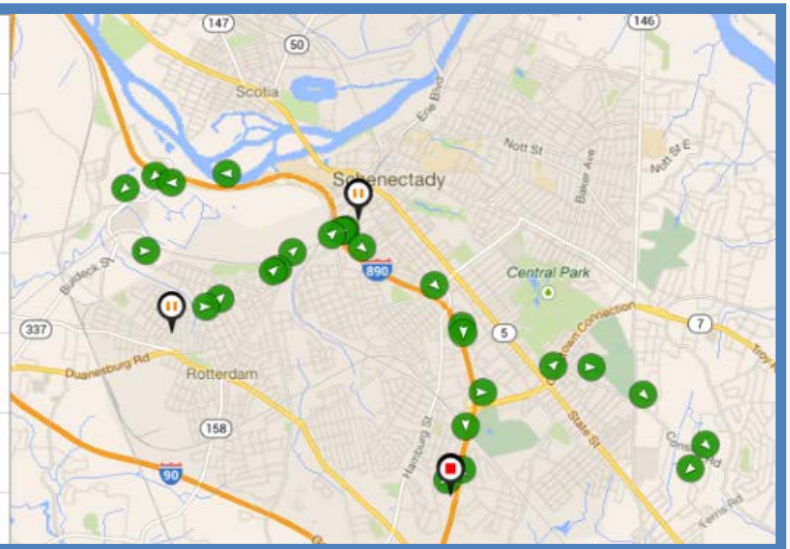
Logistics

Reduce traffic vulnerability

- Take home vehicles / Reporting directly
- Business intelligence (Fleetmatics)

Start Time	Distance (miles) Duration	Stop Location
02/25/2014		Starting from: [Arty's home] 130 Thimbleberry Road, Ballston Spa, NY 12020, USA
10:25 AM	1.5 03m 48s	[2501-2505 State Highway 9] 128-132 Dunning Street, Ballston Spa, NY 12020, USA
10:36 AM	25.32 29m 43s	543 North Pearl Street, Albany, NY 12204, USA
12:56 PM	0.51 02m 02s	[14 Broadway] 14 Broadway, Menands, NY 12204, USA





How does the infrastructure change?

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Reliability Centered Maintenance & Technology

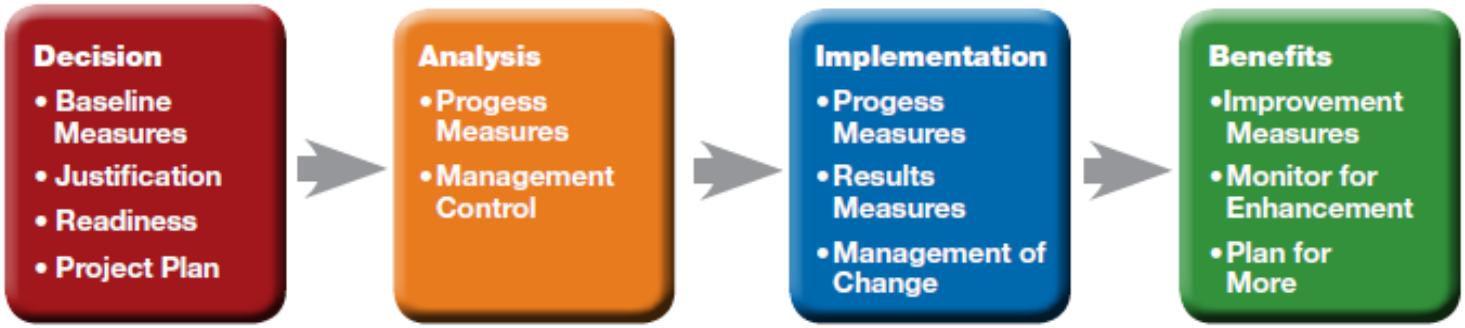


Figure 1: Four phases of an RCM project

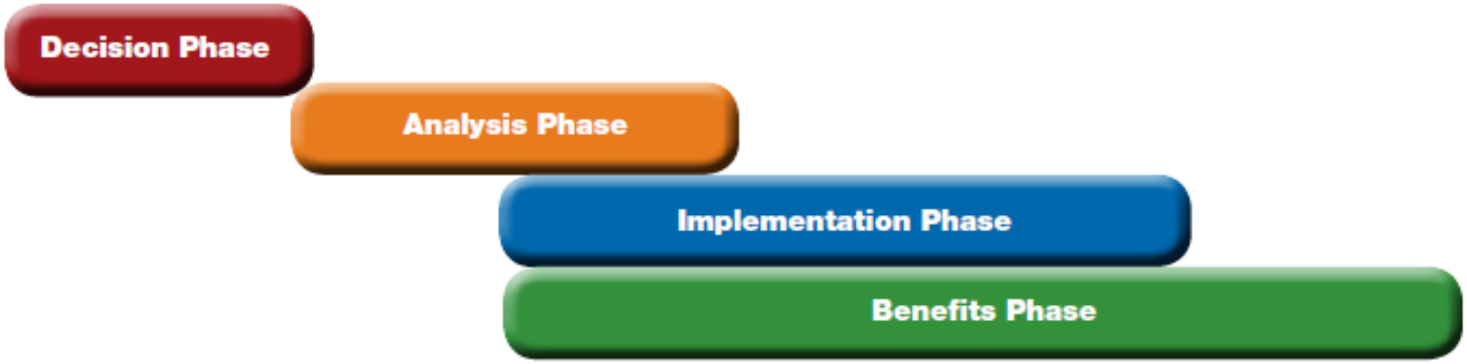
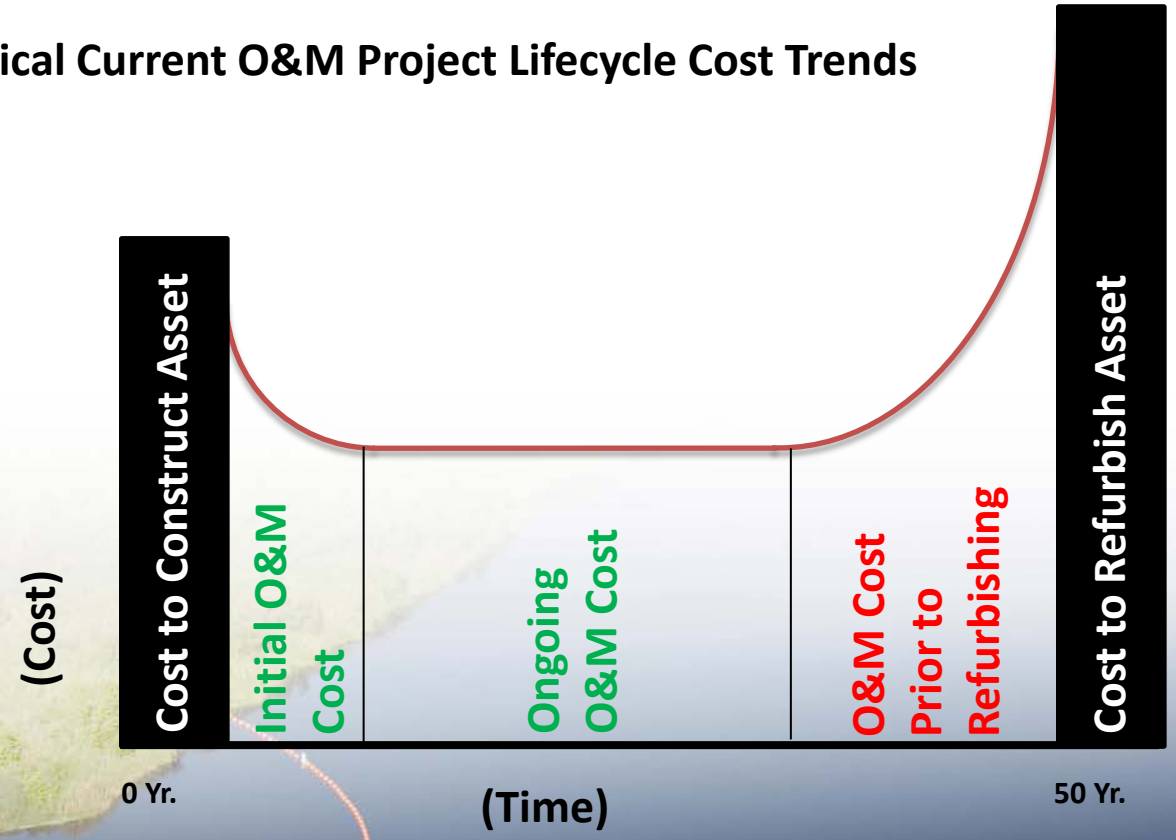


Figure 2: Phased timeline of an RCM project for early impact

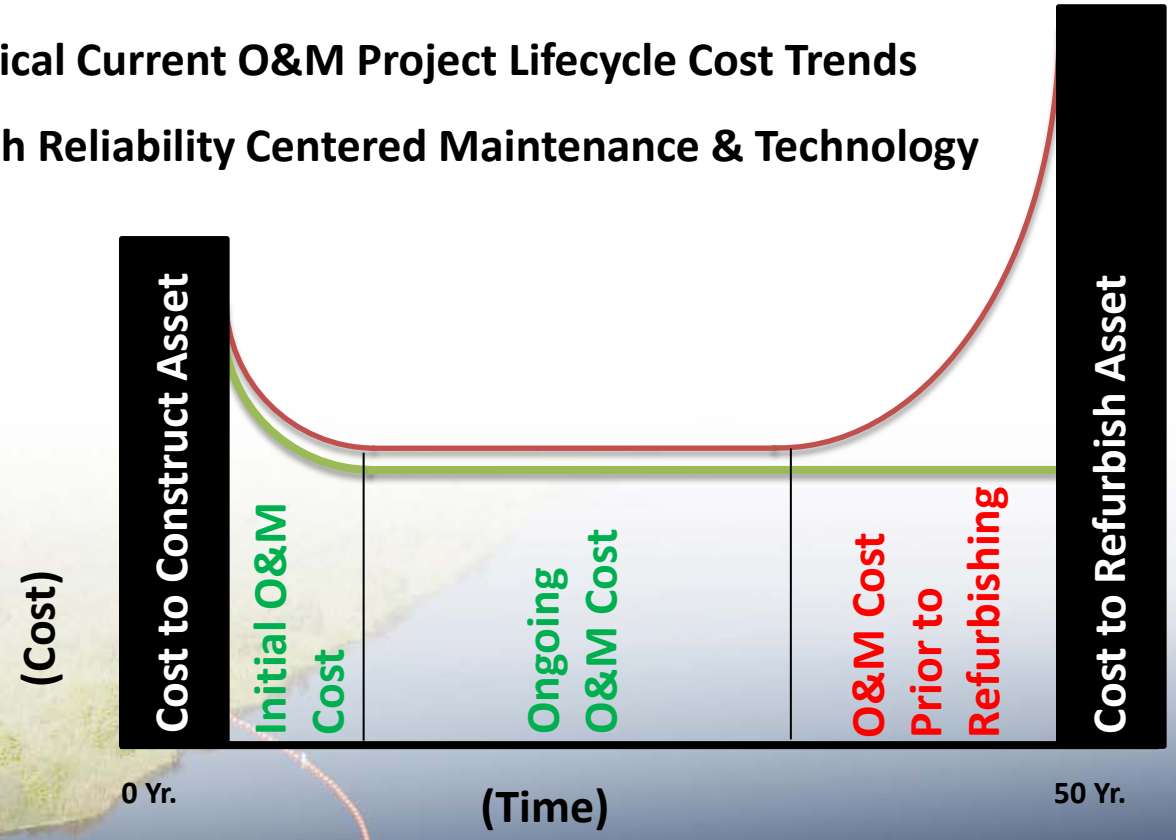
How does the infrastructure change?

- **Typical Current O&M Project Lifecycle Cost Trends**



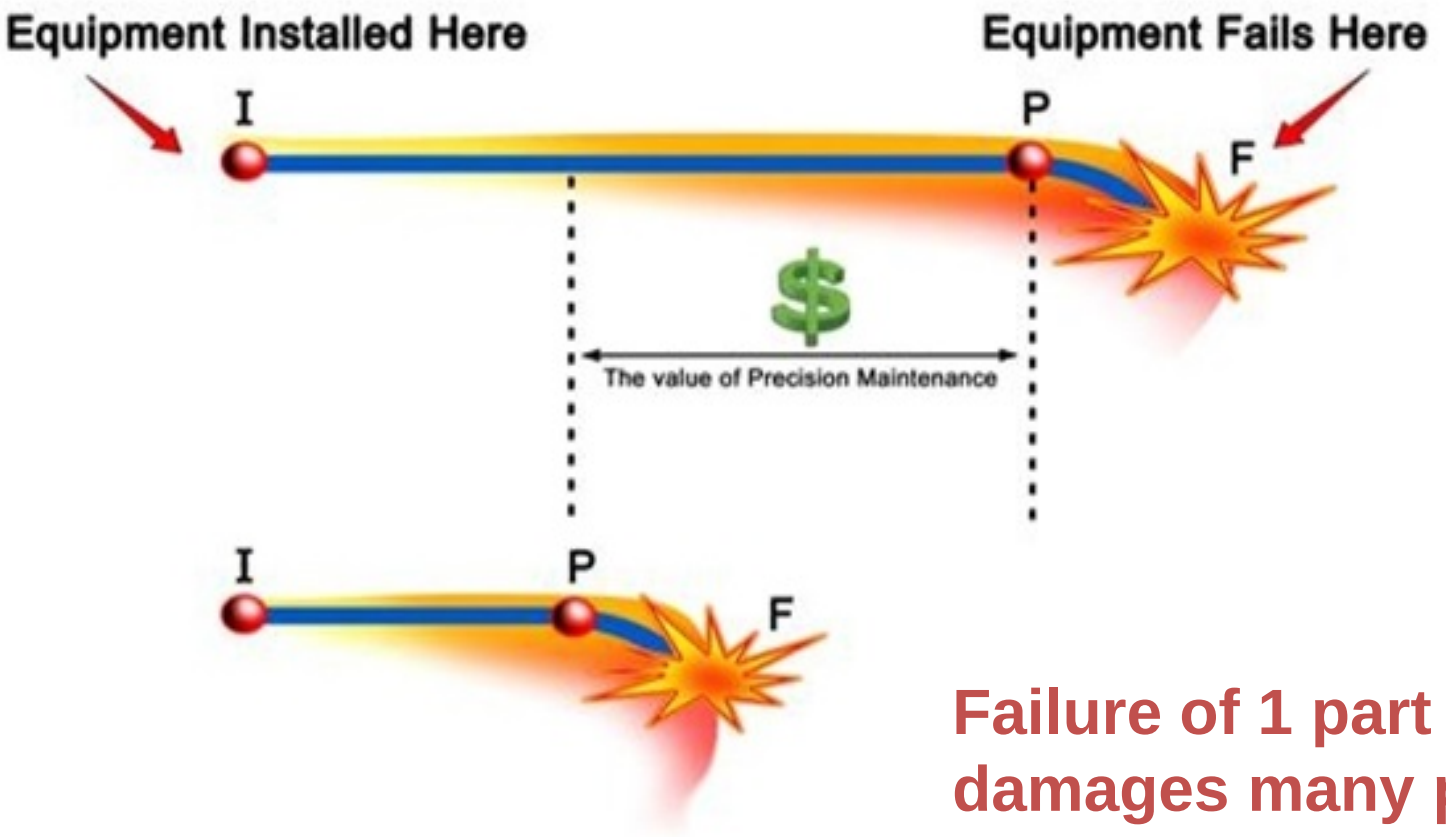
How does the infrastructure change?

- Typical Current O&M Project Lifecycle Cost Trends
- With Reliability Centered Maintenance & Technology



How does the infrastructure change?

Reliability Centered Maintenance & investments in Technology also extend the life of the equipment



Failure of 1 part often damages many parts

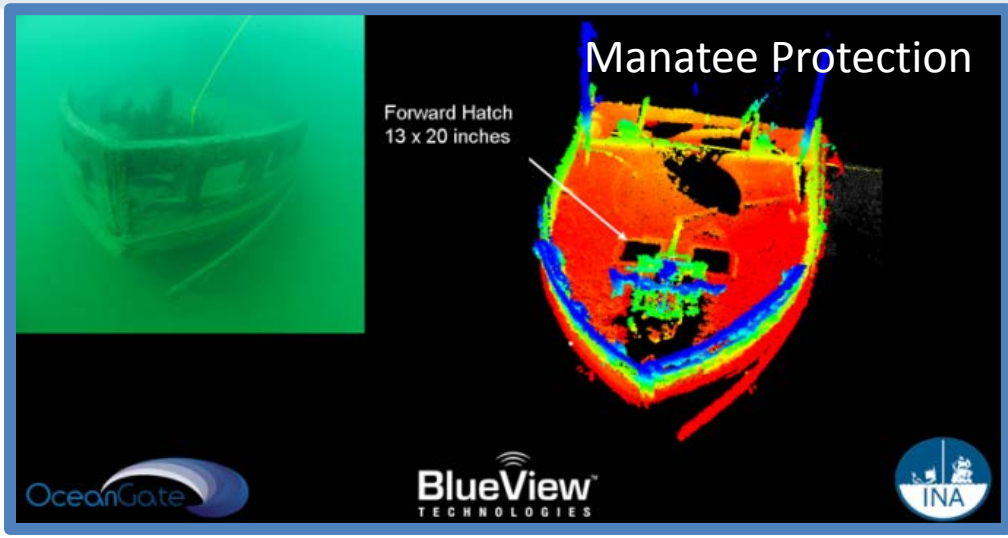
Pump Stations – RCM & Technology

Failure of 1 part can do $1M in damage overall!

: it's not just timing of a 250 gallon oil change…

Vibration analysis: continuous vs. yearly…

Water Control Structures – Technology

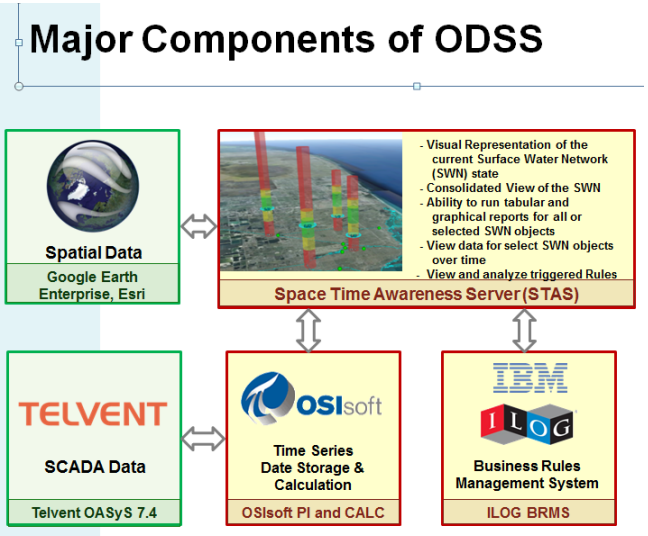


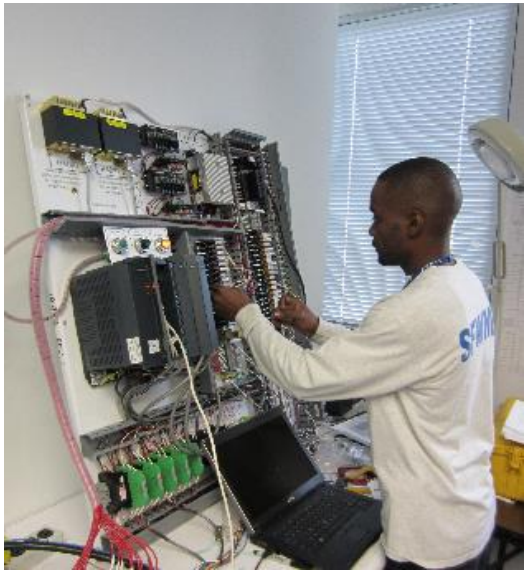
Water Control Structures – Technology

SCADA – Supervisory Control & Data Acquisition

- 1999: **360** remote telemetry sites
- 2014: **1,084** remote telemetry sites
- 201% increase

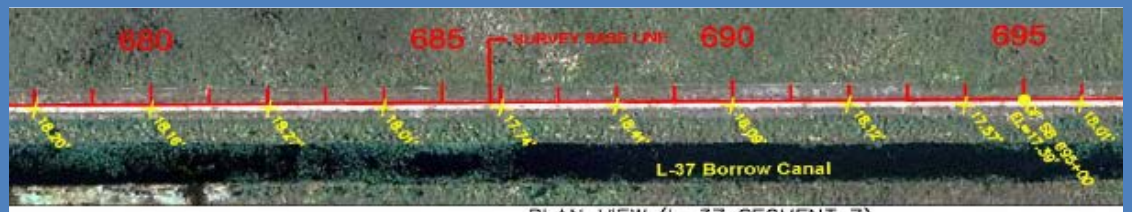
SCADA – Technology



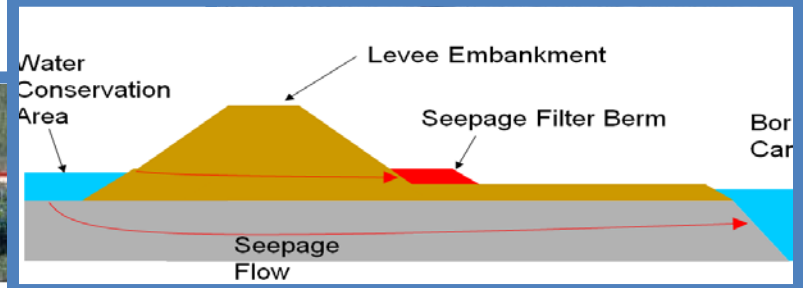


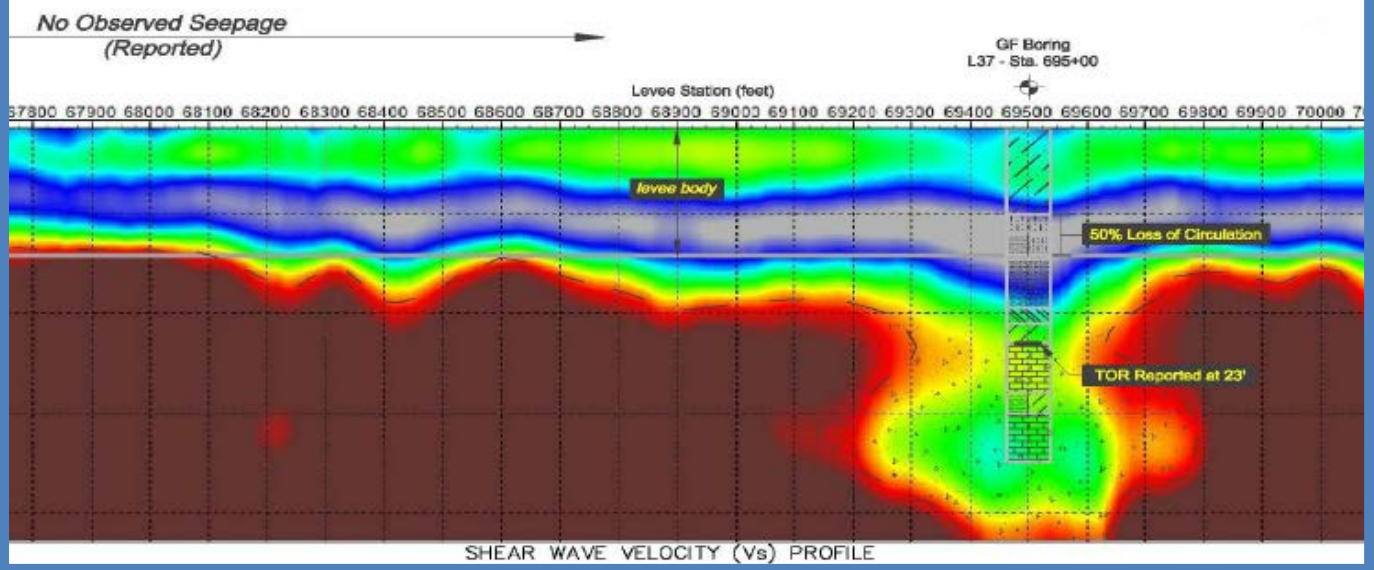
Levees – Technology

Multi-channel Analysis of Surface Waves (MASW) seismic method along ECPL



PLAN VIEW (L-37 SEGMENT 7)

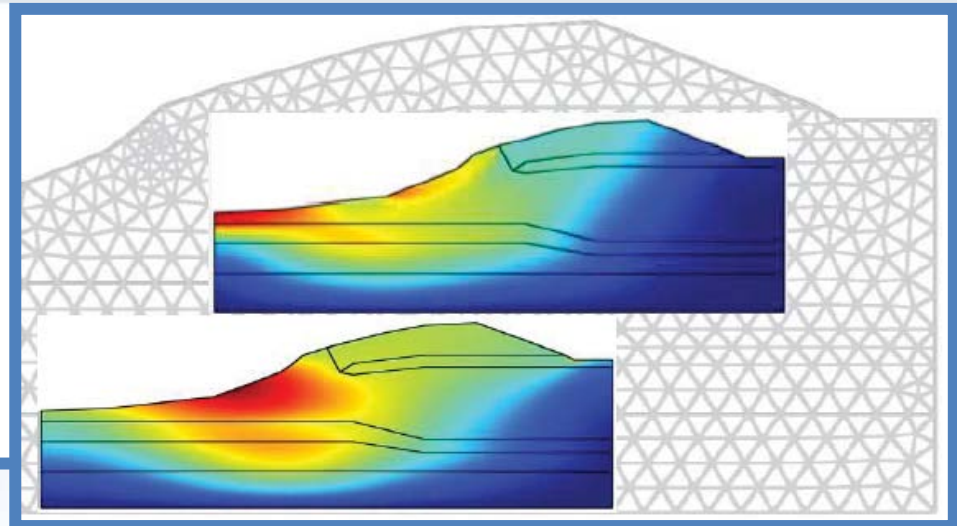




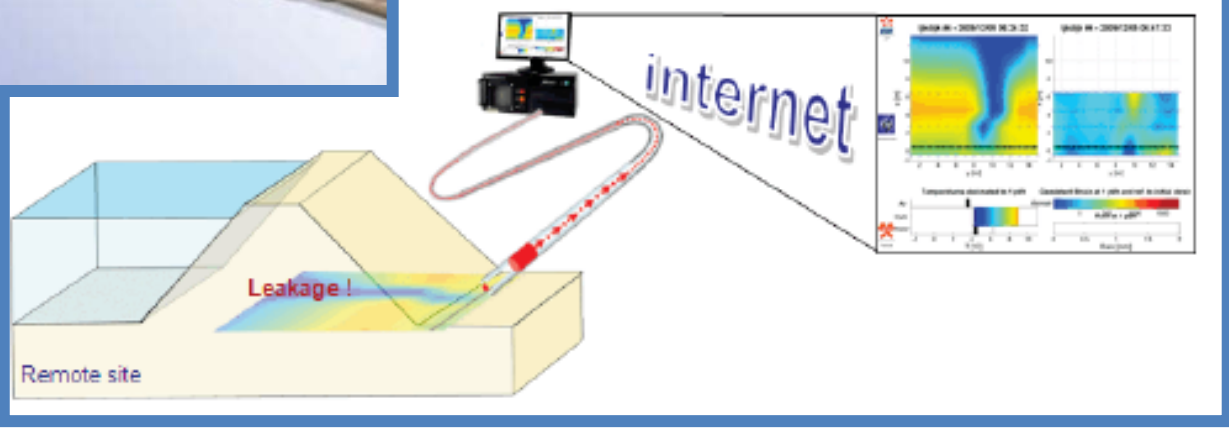
SHEAR WAVE VELOCITY (Vs) PROFILE

Levees – Technology

GPS based real-time grading



Real-time conditions sensors



Credit: UrbanFlood.eu

Levees – Technology

Credit: UrbanFlood.eu

Canals and Vegetation Management – Technology

Technology (& Biotechnology)

- Continue to Invest in Research


Grass Carp delivery at C-102

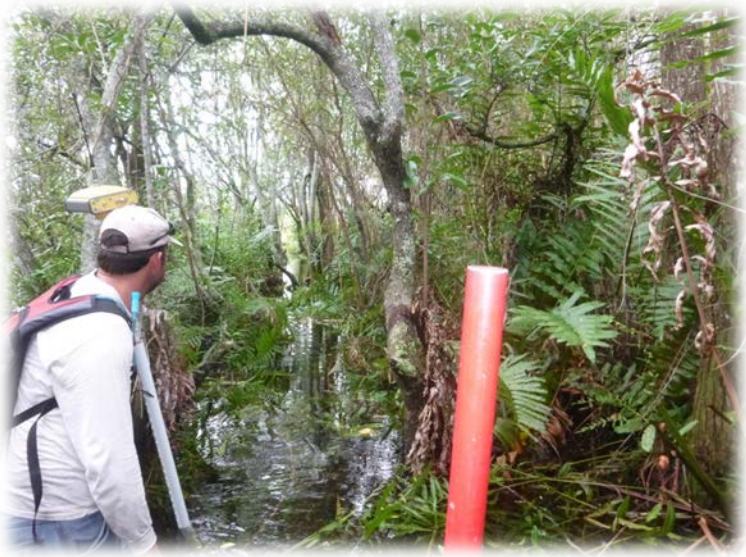

Melaleuca - Mass Rearing Annex

Canals and Vegetation Management – Technology

Single-operator Conver in BCB canal

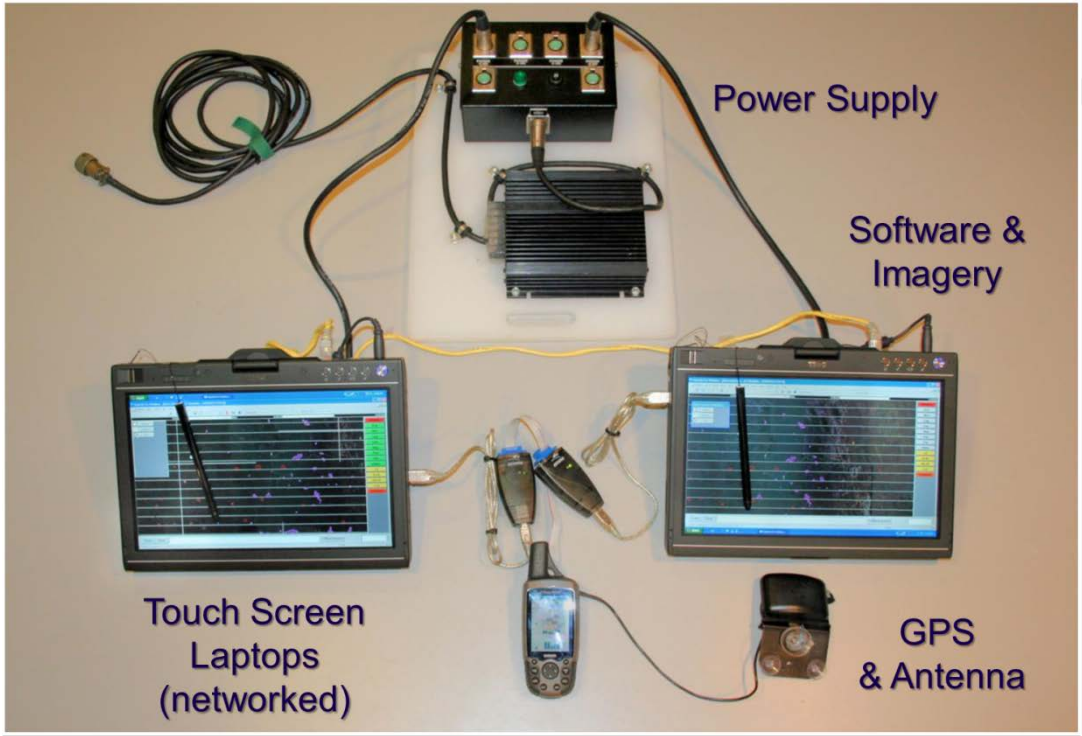
Land Management & Technology

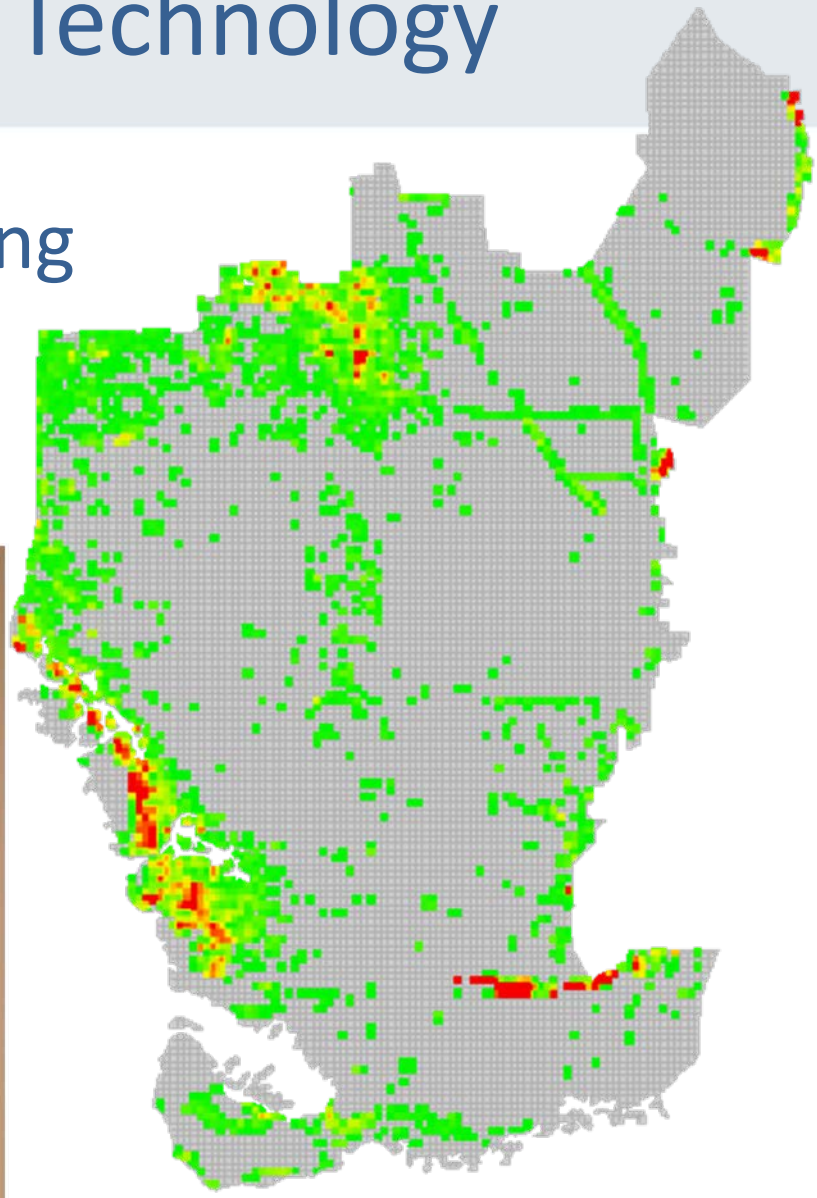
Adapting techniques learned from US Forest Service



Land Management & Technology

Digital Aerial Sketch Mapping (DASM)



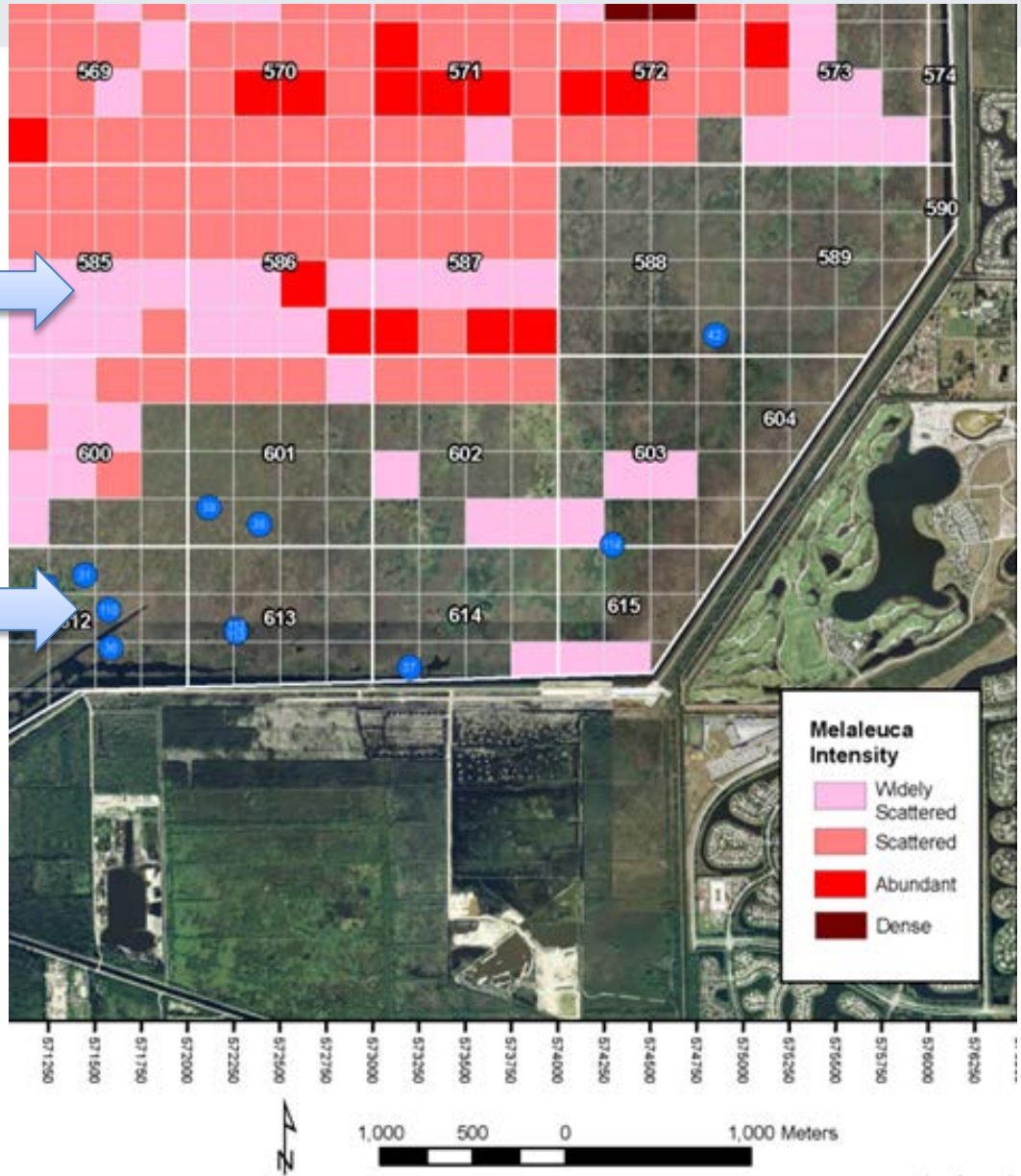


Land Management & Technology

DASM

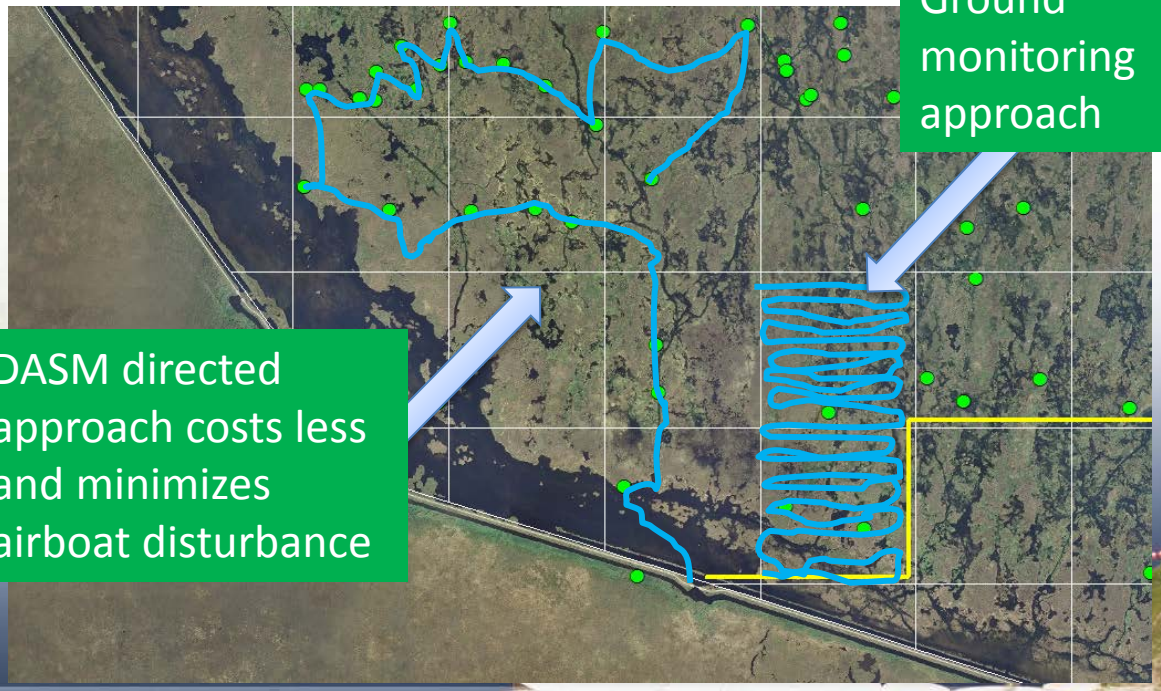
Widely scattered to abundant

Outliers



Land Management & Technology

Cost-effective Collection of Plant Coordinates



Ground monitoring approach

DASM directed approach costs less and minimizes airboat disturbance

Other Data Gathering Technology

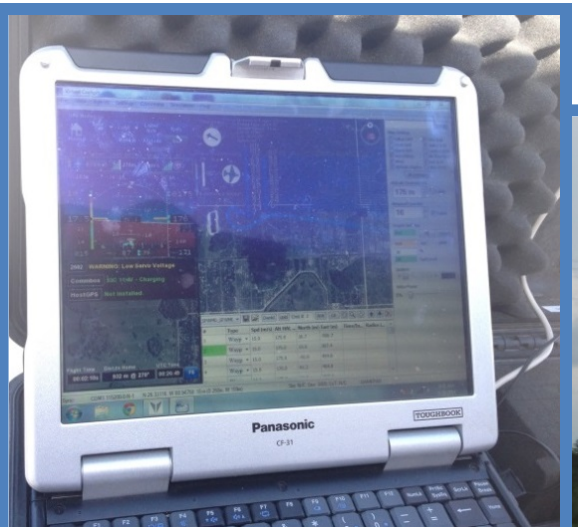
Multiple FTE's support a Diver

Subaqueous Technology

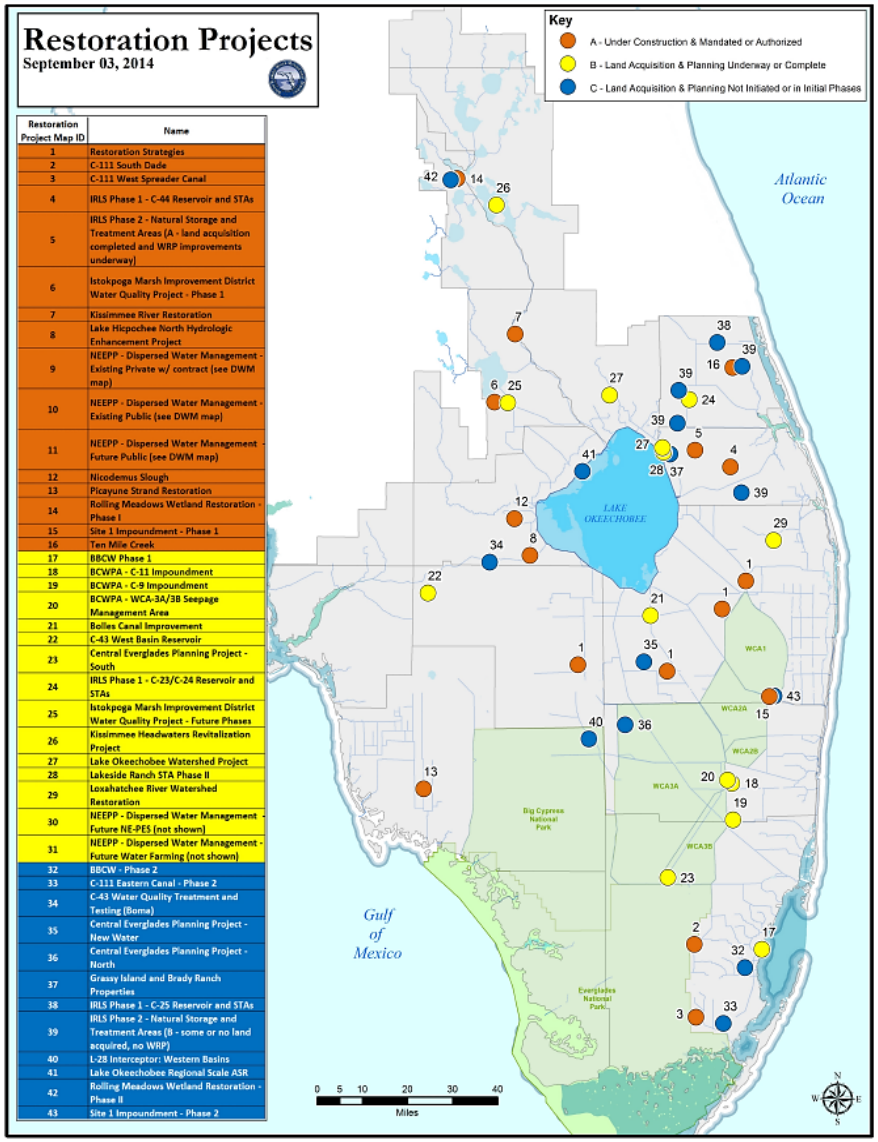
Other Data Gathering Technology

Remote-piloted Aerial Systems

- Pre-storm and post-storm reconnaissance
- Canal and levee safety inspections
- Remote site data acquisition
- Construction documentation



Restoration Projects

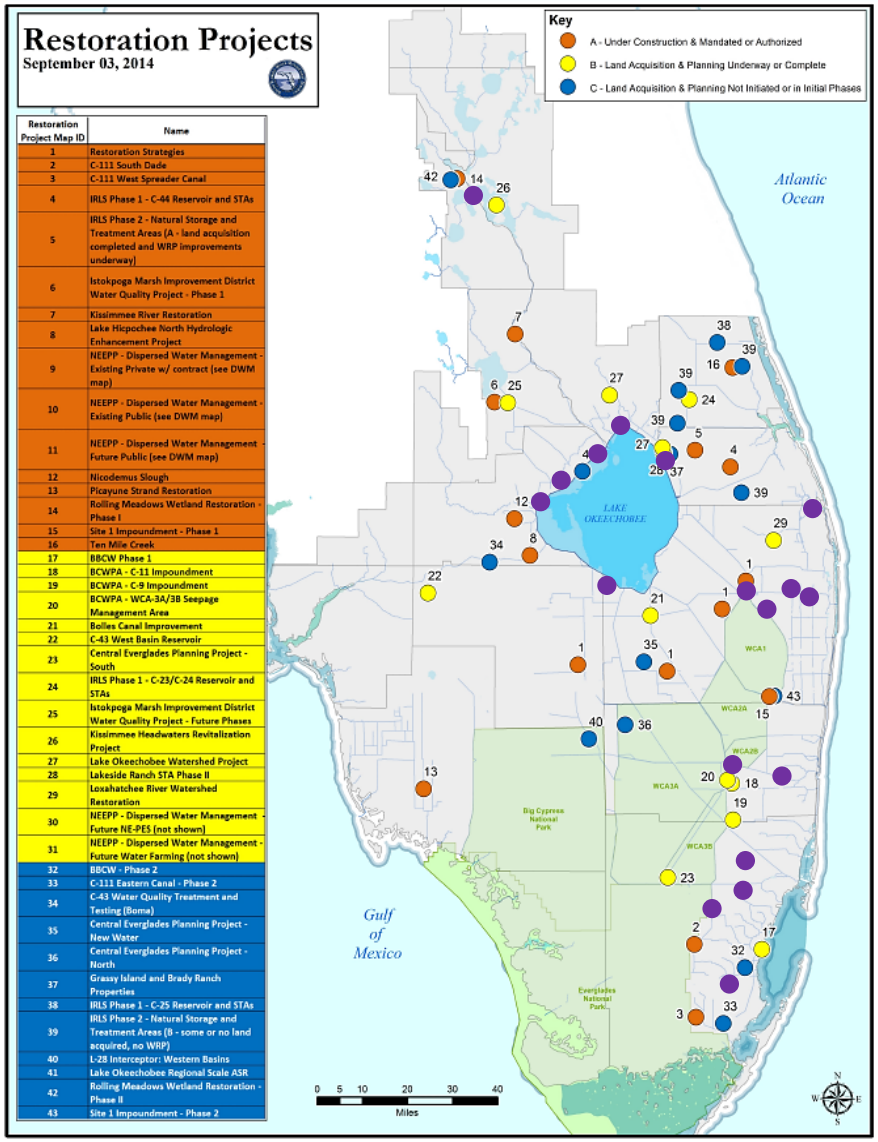


Restoration Project Map ID	Name
1	Restoration Strategies
2	C-111 South Dade
3	C-111 West Spreader Canal
4	IRLS Phase 1 - C-44 Reservoir and STAs
5	IRLS Phase 2 - Natural Storage and Treatment Areas (A - land acquisition completed and WRP improvements underway)
6	Istokpoga Marsh Improvement District Water Quality Project - Phase 1
7	Kissimmee River Restoration
8	Lake Hicpochee North Hydrologic Enhancement Project
9	NEEPP - Dispersed Water Management - Existing Private w/ contract (see DWM map)
10	NEEPP - Dispersed Water Management - Existing Public (see DWM map)
11	NEEPP - Dispersed Water Management - Future Public (see DWM map)
12	Nicodemus Slough
13	Picayune Strand Restoration
14	Rolling Meadows Wetland Restoration - Phase I
15	Site 1 Impoundment - Phase 1
16	Ten Mile Creek
17	BBCW Phase 1
18	BCWPA - C-11 Impoundment
19	BCWPA - C-9 Impoundment
20	BCWPA - WCA-3A/3B Seepage Management Area
21	Bolles Canal Improvement
22	C-43 West Basin Reservoir
23	Central Everglades Planning Project - South
24	IRLS Phase 1 - C-23/C-24 Reservoir and STAs
25	Istokpoga Marsh Improvement District Water Quality Project - Future Phases
26	Kissimmee Headwaters Revitalization Project
27	Lake Okeechobee Watershed Project
28	Lakeside Ranch STA Phase II
29	Loxahatchee River Watershed Restoration
30	NEEPP - Dispersed Water Management - Future NE-PES (not shown)
31	NEEPP - Dispersed Water Management - Future Water Farming (not shown)
32	BBCW - Phase 2
33	C-111 Eastern Canal - Phase 2
34	C-43 Water Quality Treatment and Testing (Berna)
35	Central Everglades Planning Project - New Water
36	Central Everglades Planning Project - North
37	Grassy Island and Brady Ranch Properties
38	IRLS Phase 1 - C-25 Reservoir and STAs
39	IRLS Phase 2 - Natural Storage and Treatment Areas (B - some or no land acquired, no WRP)
40	L-28 Interceptor: Western Basins
41	Lake Okeechobee Regional Scale ASR
42	Rolling Meadows Wetland Restoration - Phase II
43	Site 1 Impoundment - Phase 2

Restoration Projects:

- Under Construction & Mandated or Authorized
- Land Acquisition & Planning Underway
- Land Acquisition & Planning Not Initiated or in Initial Phases

$50M O&M Capital Projects



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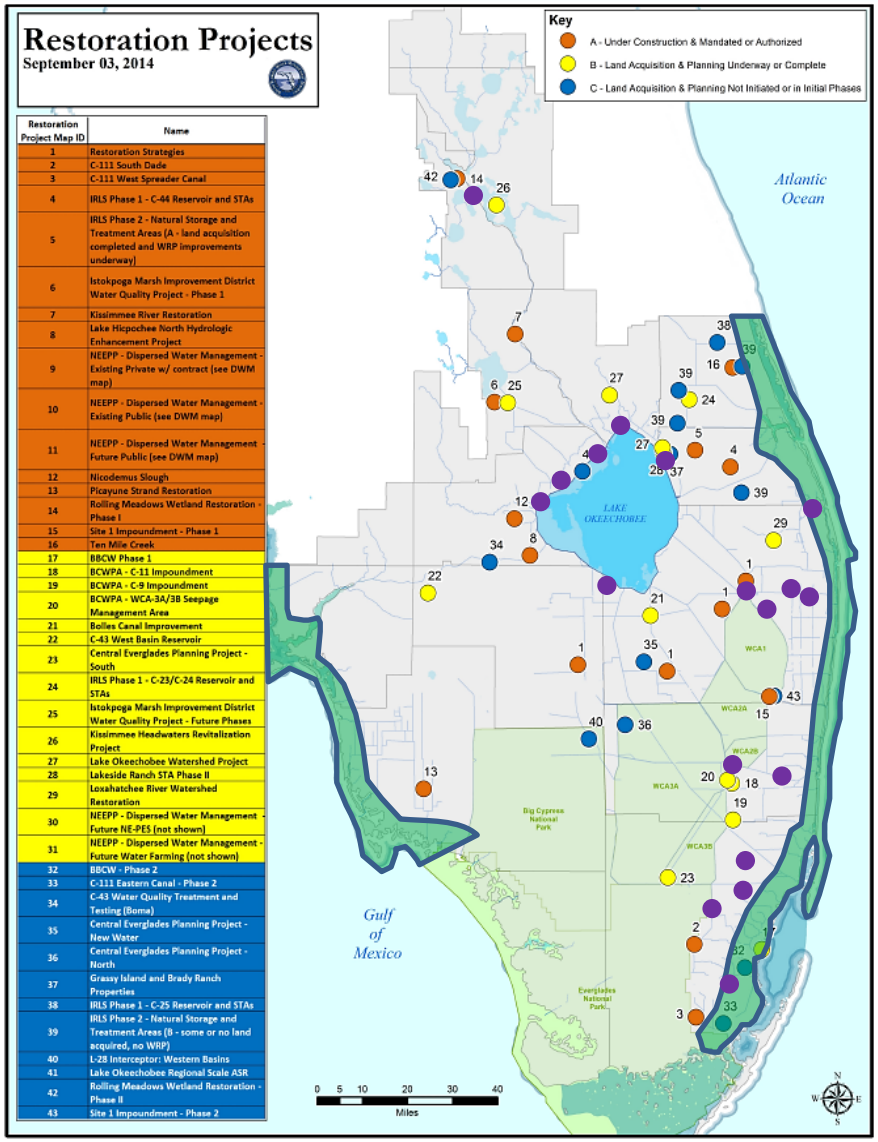
FY16 O&M Construction

- Key Capital Projects

Future - Coastal, Sea Level Rise



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FY16 O&M Construction

- Key Capital Projects

Potential Future Project Areas:

- To Address Coastal, Sea Level Rise

Discussion

- Potential Initiatives to offset O&M increases:
  - Central Warehousing
  - Expand real time / mobile platform work order usage
  - Fleetmatics dispatch and accountability platform
  - Take home vehicles / Direct reporting to sites
  - Reliability based maintenance capabilities
  - Equipment & Technology improvements on managing existing infrastructure
    - SCADA – Remote Operation
    - Canals & Levees
    - Vegetation Management
    - Other?

Next Steps

- Capital Refurbishment to offset long term O&M Cost
  - Field Stations (February Governing Board)
  - Canals & Levees
  - Supplemental Pump Stations
  - Improvements to Water Management