Sustainable Solutions for Integrated Watershed Management

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Today's Focus

- What is Integrated Watershed Management?
- IWM – Planning Concepts & Partnering Strategies
- Coastal Opportunities
- Project Example in Collier County

Integrated Watershed Management is.....

A comprehensive approach to balance water needs throughout a watershed as it relates to the natural resources, potable water supplies, stormwater management, agricultural uses, flood control and commercial processing.

“Smart Water”

Integrated Watershed Management

Basic Concepts

- Preserve the Natural Functions of the Watershed
- Support Land Use Planning
- Maintain/Restore Aquatic Ecosystems
- Preserve and Plan for Water Supply Needs
- Flood Control
- More Practical Stormwater Management

Integrated Watershed Management

Benefits

- Identify and Prioritize Critical Needs
- Promote Sustainable Practices and Technologies
  - Water Resources
  - Stormwater Management
  - Agricultural Activities
- Develop Solutions that Address More than One Need
- Streamline Permitting Efforts

Integrated Watershed Management

Difficulties

- Continuous Coordination amongst Stakeholders
- Cooperative Funding and Timing
- Impacts to Existing Infrastructure and Utilities
- Aligning Project Schedules amongst Stakeholders
- Permitting
- Leadership/Political Turn-over

IWM Concerns for Florida

Political lines are different from watershed boundary lines.

Too much water during the rainy season and how to store this resource during the “dry” season.

Maintaining Minimum Flow Limitations within Rivers and Streams.

Aquifer Recharge

What is Integrated Watershed Management

Water Supply Demand

Resiliency

Alternative Sources

Source Security

What is Integrated Watershed Management

Wastewater Processing

New Treatment Technology

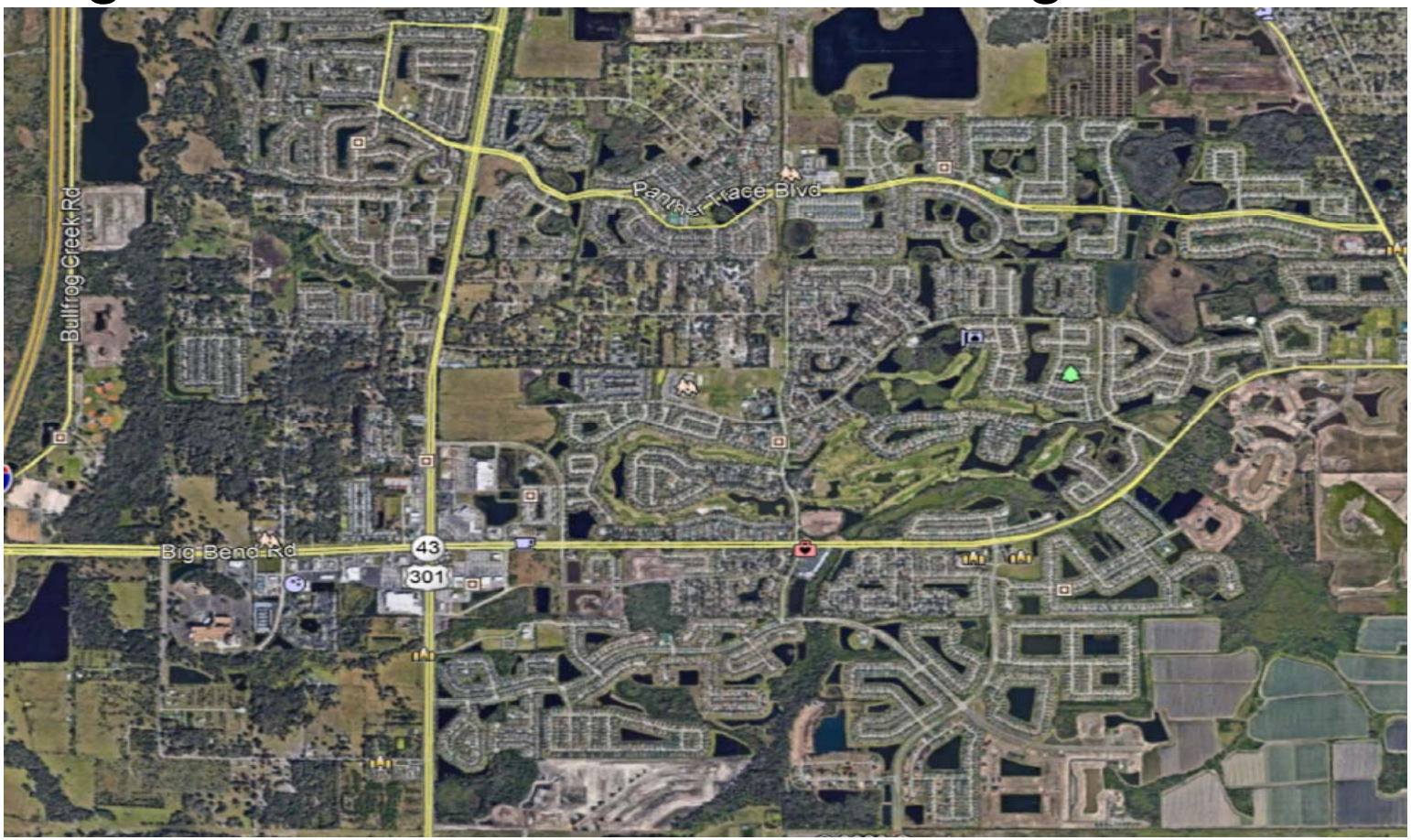
Potable Supply Considerations

What is Integrated Watershed Management

Stormwater Management

Regional Solutions

More Purposeful Use of Real Estate



What is Integrated Watershed Management

Restoration Projects

Promote Recharge

Water Quality Enhancements

Create Habitat

What is Integrated Watershed Management

Flood Control

Plan Infra-structure Upgrades

Prevent Future Repair Costs

What is Integrated Watershed Management

Groundwater Recharge

Natural Opportunities as Opposed to Reservoirs

Water Quality Improvements

Future Supply

Coastal Opportunities and Considerations

Competing Interests within Coastal Areas

Tax Revenue for Local Municipalities ($$$$)

Provide and Maintain Access and Safety ($$$$)

MONEY Versus MONEY

King Tide Flooding on Indian Creek Drive at 32nd Street

Miami Beach, September 2015

Design Considerations

- Desired Service Life, i.e. 25, 50 or 100-Year
- Appropriate Design Frequency, i.e. 3, 5, 10, or 25-Year LOS for Shared Outfalls
- Tailwater Considerations & SLR Projection
- Tropical Systems and Storm Surge
- Coastal FEMA Floodplain Map Updates

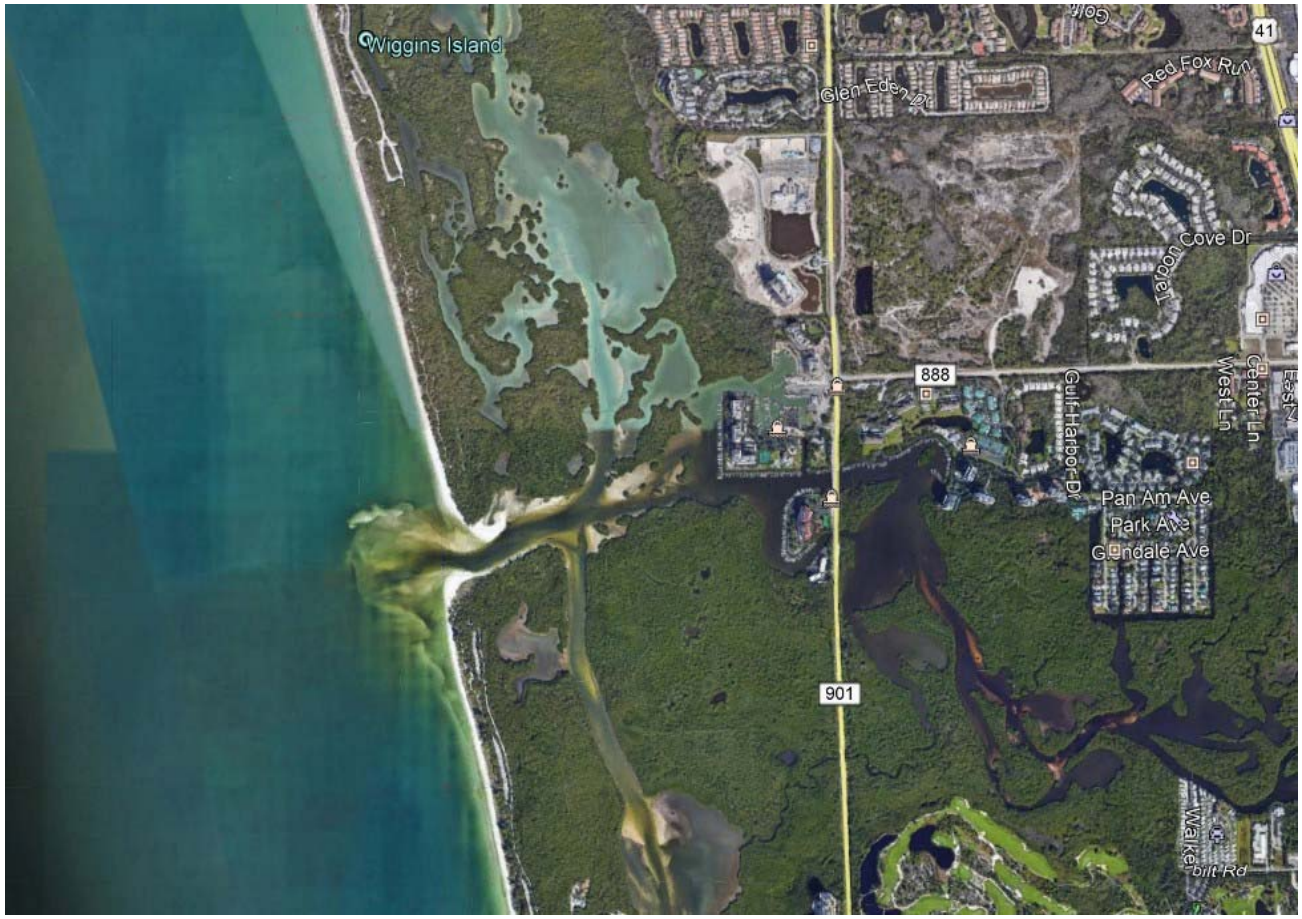
King Tide Flooding on Indian Creek Drive at 30th Street
Miami Beach, September 2015

Long Term Strategies for Resilience

- Collaborative Planning to address Coastal Management and Associated Costs
- Risk Tolerance
- First Responder Needs
- Infra-Structure and Utility Upgrades

Long Term Strategies for Resilience

- Restore Coastal Inlets and Relief Passes
- Adaptive Designs to respond to localized SLR Trends
- Stormwater Designs to Protect Against Saltwater Intrusion
- Protection for Registered Estuaries



Long Term Planning Strategies

- Utility Relocations
- Infra-Structure Improvements and Relocations
- More Robust Land Development Codes (LDC)
- Consistency Amongst the Regulatory Agencies
- Greater Stakeholder Engagement

Wastewater Plant on Virginia Key, Miami

Risk Allowance

- Site Specific
- Temporary Utility Impacts
- Importance of Protection versus Environmental Impacts
- Estimated Costs to Upgrade the Infra-structure, which includes roadways, utilities, right-of-way, etc.

Risk Allowance

- Extent of Inundation
- Business/Tourism Impacts
- First Responder Coordination
- Daily Service Interruptions
- Agricultural Impacts

King Tide Flooding on Indian Creek Drive at 30th Street

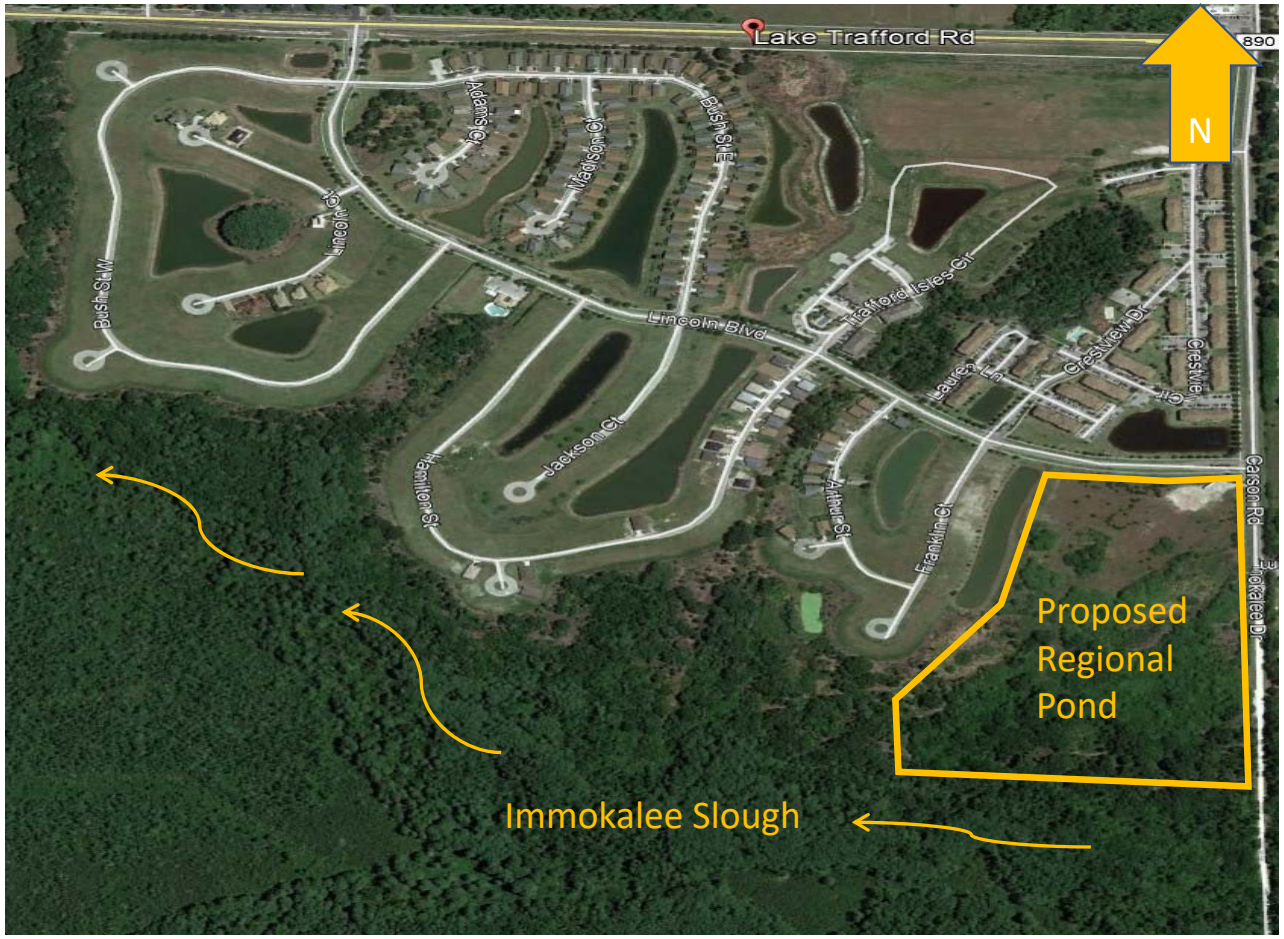
Miami Beach, September 2015

Lake Trafford Stormwater Improvements

IWM Approach for Water Quality

Lake Trafford Regional Stormwater Pond

- Regional Approach to Improve Water Quality for Lake Trafford
- Achieve Dual Goal of Flood Relief with Restoration of Lake Trafford Basin Runoff
- Create an Environmentally Friendly Park for Education and Recreational Purposes

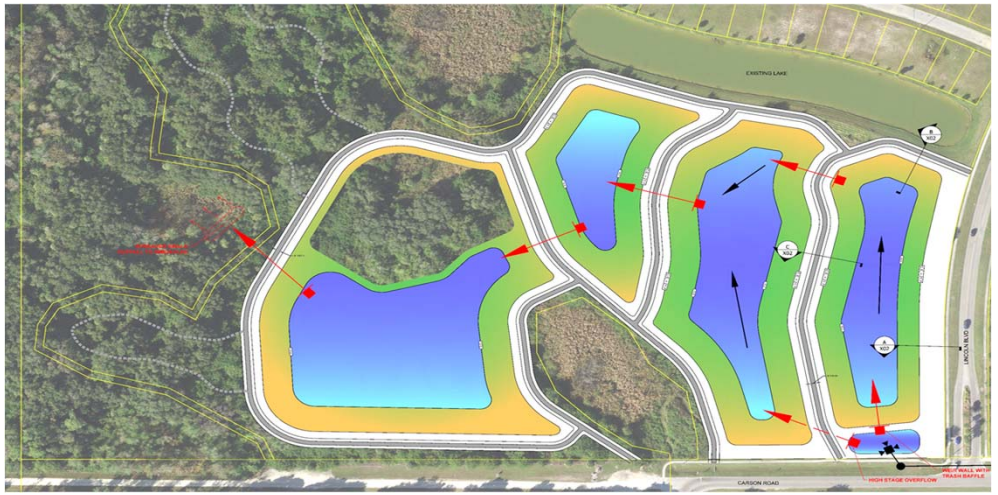


Lake Trafford Regional Stormwater Pond

- Maximize Nutrient Load Reductions
- Highlight Benefits of Capturing Untreated Runoff to Slough
- Regional Pond Design to Establish Appropriate Groundwater Stages to Preserve Intended Function

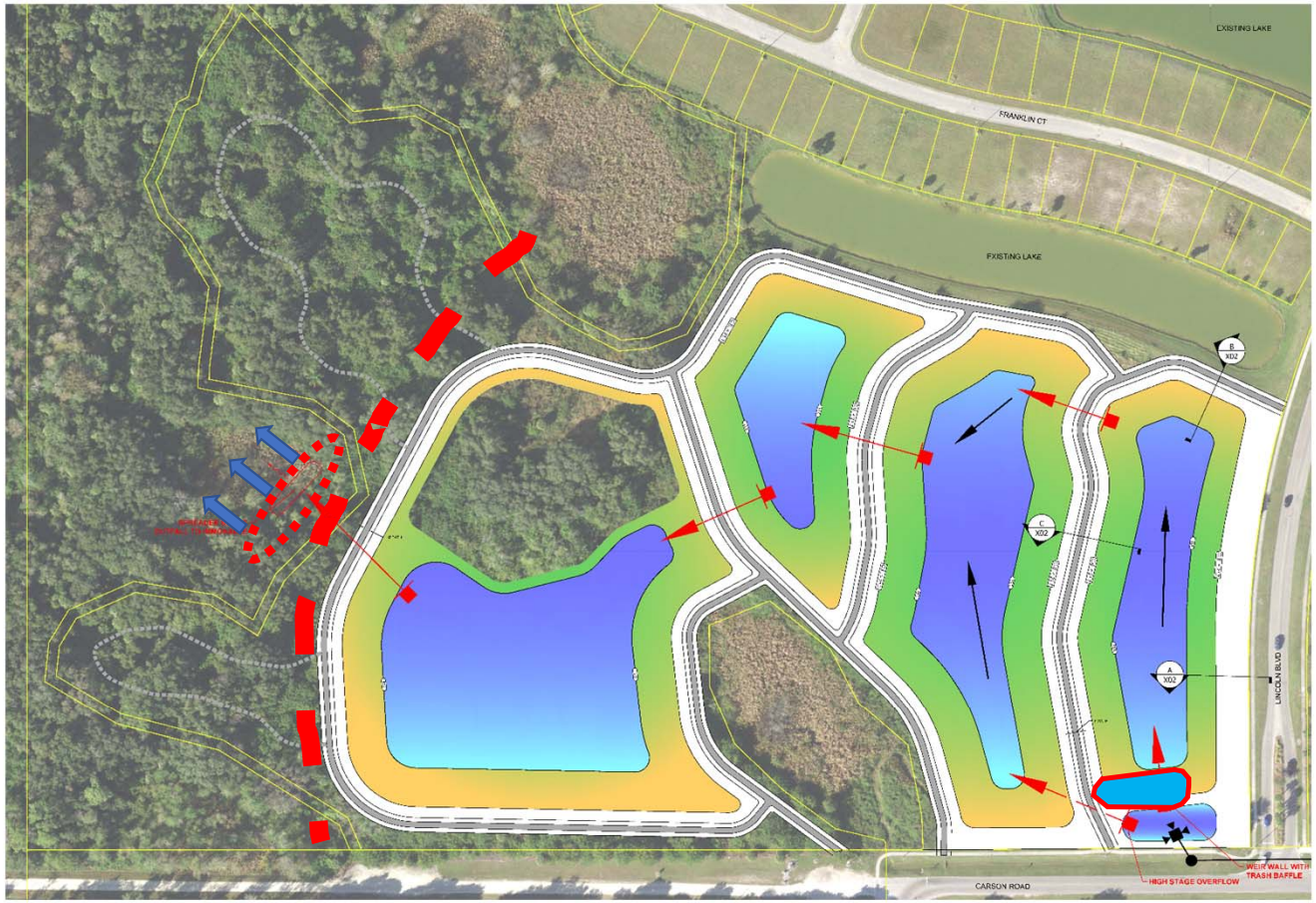
Pond Design General Concepts

- Determination of Low Water Elevation Will Be Crtitical
- Shallow with Gradual Slopes for Safety, Maintenance, Plant Growth
- Pond Excavation Volume to Offset Road Filling Needs
- Design Must Consider Available County Maintenance Resources
- Set Excavation Depth for Wading Bird Foraging



Regional Pond Design Strategy

- Separate Into Lower and Upper Bays by Receiving Area
- Extend Flow Path For Increased Settling Time in Typical Storms
- Trash Removal
- Allow Larger Storm Events to Bypass Flow Path to Maintain Tailwater



Existing Residential Stormwater Pond

- Conservation Land to the Associated with Lake Trafford
- Minimize Impacts to Existing Wetlands
- Address Recurring Flooding to the Community

Stormwater Pond Retro-Fit

- Expand the Existing Pond for Water Quality Improvements
- Incorporate Existing Wetlands into the Ultimate Design
- Develop Solutions that are Maintenance Friendly

Concluding IWM Thoughts

- Requires Dynamic Thinking, Planning and Coordination
- Ability to Target Watershed Specific Needs
- More Efficient and Effective Use of Financial Resources
- Practical, Permittable, and Ecological Driven Solutions

Further need to consider IWM???

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