

WELCOME



Integrated 1Water Engineering / Business Approach to Solving FL Resource Water Challenges

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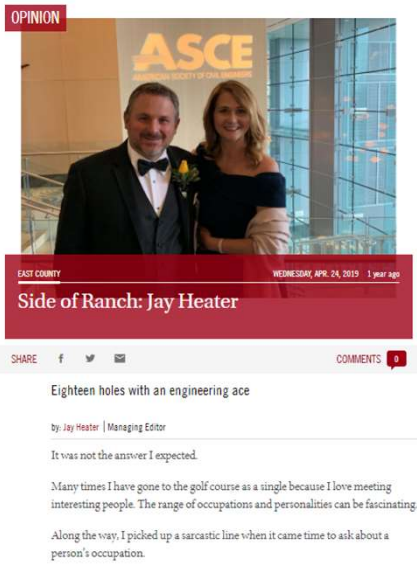
VEITH ENGINEERING & BUSINESS SOLUTIONS

1

AGENDA

## AGENDA

1. Introduction
2. Florida's Water Resource Challenges
3. What is and Why One Water?
4. Integrated Approach and Solutions
  - a) Framework
  - b) Technical, Business, & Stakeholder
5. Keys to Success
6. Case Studies



OPINION

ASCE  
AMERICAN SOCIETY OF CIVIL ENGINEERS

EAST COUNTY WEDNESDAY, APR. 24, 2019 1 year ago

Side of Ranch: Jay Heater

SHARE f t e COMMENTS 2

Eighteen holes with an engineering ace

by Jay Heater | Managing Editor

It was not the answer I expected.


Many times I have gone to the golf course as a single because I love meeting interesting people. The range of occupations and personalities can be fascinating.

Along the way, I picked up a sarcastic line when it came time to ask about a person's occupation.

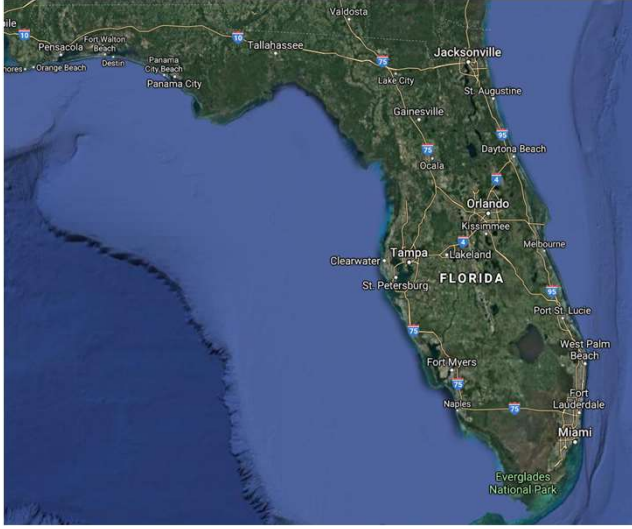
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INTRODUCTION




“Water, water everywhere in state of Florida!  
 50+ inches of rain annually, home to the second-largest freshwater lake wholly in the U.S. (Lake Okeechobee), and the state surrounded by water on three sides – is there really water resources to solve?”




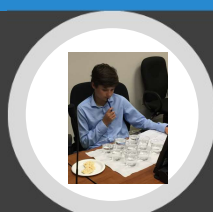
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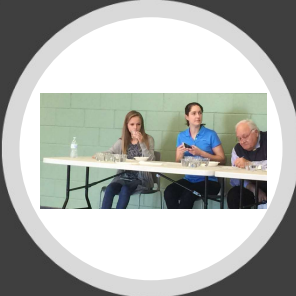
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FLORIDA WATER RESOURCE CHALLENGES











### Complex Water Resource & Environmental Challenges

- Population Growth
- Diminishing Water Supplies
- Saltwater Intrusion
- Evapotranspiration
- Highly Variable Seasonal and Yearly Weather Patterns
- Flooding / Drought
- Tropical Systems
- Water Quality
- Red Tide

4

4



5

WHAT IS ONE WATER?

## WHAT IS ONE WATER?

### One Water Defined

“One Water is an integrated planning and implementation approach to managing finite water resources for long-term resilience, sustainability and reliability, meeting both community and ecosystem needs.”  
*The Water Research Foundation*

“A collaborative and innovative water management approach to enhance sustainability of our essential resources and overall quality of life resulting in multiple local and regional benefits”  
*City of Winter Haven, 2019*

The One Water Cycle diagram illustrates the integration of water management across different sectors. It shows the flow of water from precipitation through various uses and treatment stages. The sectors depicted include Residential, Commercial, Industrial, and Sustainable Development. Key components include Rainwater Harvesting, Green Infrastructure, and Water Treatment. A legend on the right identifies four stages: 1. Water Treatment, 2. Wastewater Treatment, 3. Advanced Treatment, and 4. Stormwater Management. The diagram also shows the flow of water from the ground to the sea level, indicating the importance of maintaining water quality and quantity.

6

6



## WHY ONE WATER?

### Water is Essential!

Water is VITAL, PRECIOUS, and in need of our FOCUS and INVESTMENT

“The One Water Approach is applied using science and engineering-based assessment approach and tools along with cost-risk-benefit business analytics resulting in sustainable and innovative solutions that promote responsible stewardship of social, economic, and environmental resources.”

*Bryan Veith, 2019*

“Water is essential to everything we do, from the water we need to brush our teeth and make coffee in the morning, to the water farmers need to grow crops, and firefighters need to keep us safe. But the systems that deliver this essential resource are at risk.”

*US Water Alliance*



## WHY ONE WATER?

### Recognized Benefits

Achieve Efficiencies with Finite Resources (i.e. accomplish more as one, by sharing resources)

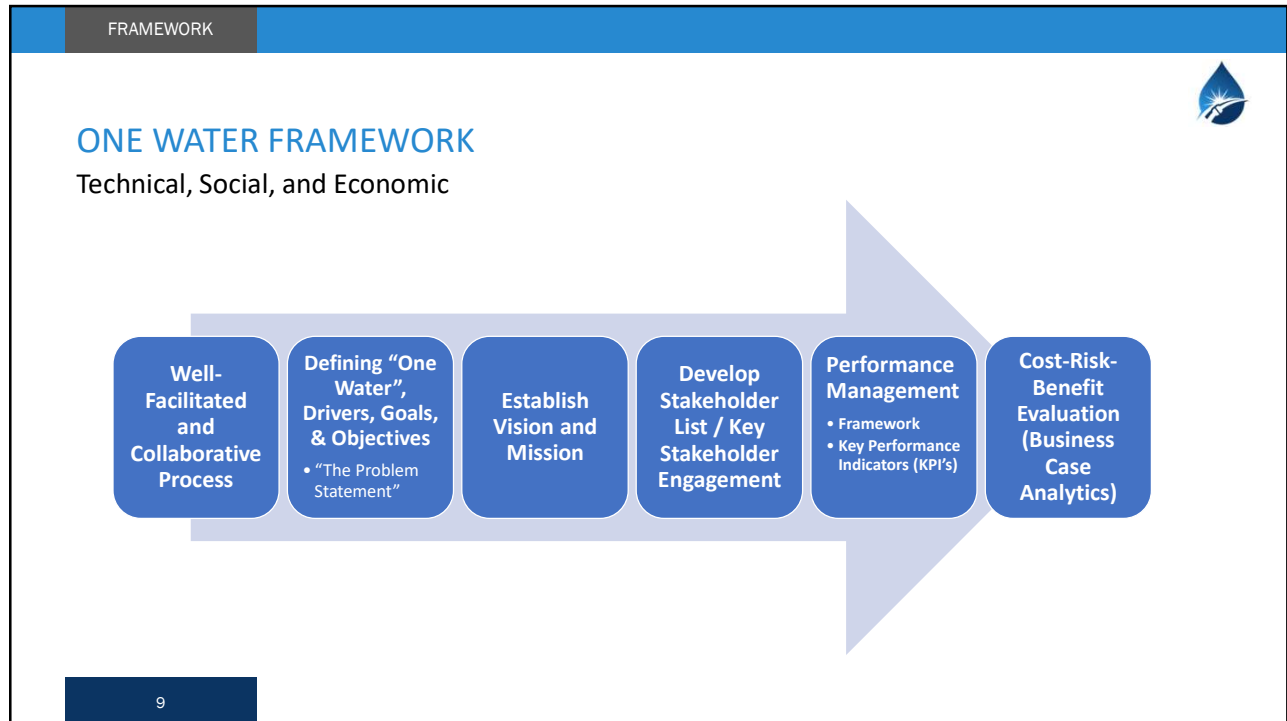
Minimizes Competing Interests

Enhanced Collaboration and Communications

Opens More Doors for Outside Funding

Solve Complex Problems with One Integrated Solution

One Water Framework Helps Align Water Agency Departments for Success and Maximize Return on Investment (ROI)



9

**ONE WATER FRAMEWORK – WELL-FACILITATED AND COLLABORATIVE PROCESS**


One Water Framework is Key to Establishing Your "Plan's" Foundation

- External Workshops For Early and Timely Stakeholder and Public Engagement
- Collaborative and Fully Integrated Planning Process
- A Series of Interactive Internal Workshops to Establish the Strong Foundation and Guiding Principles

10


10

FRAMEWORK



## ONE WATER FRAMEWORK – DEFINING “ONE WATER”, DRIVERS, AND GOALS

What, Why, Who, How, Where – Defining the Attributes



- **What** is the Approach and **Who** is executing it?
- **How** are the Benefits realized?

Water is **VITAL, PRECIOUS**, and in need of our **FOCUS** and **INVESTMENT**

“The One Water Approach is applied using science and engineering-based assessment approach and tools along with cost-risk-benefit business analytics resulting in sustainable and innovative solutions that promote responsible stewardship of social, economic, and environmental resources.”

*Bryan Veith, 2019*

11

11

FRAMEWORK



**S M A R T**



Specific    Measurable    Attainable    Relevant    Time Based

12

12



## ONE WATER FRAMEWORK – STAKEHOLDER ENGAGEMENT

Steps to Project Success

Stakeholder Identification and Categorization

Initial Communication(s)

Develop Clear/Concise

- Project Overview
- Message
- Engagement Rules and Timing

Stakeholder Questionnaire and Evaluation

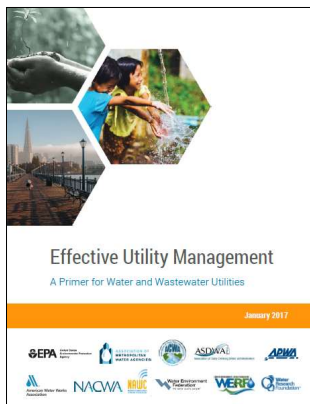
Stakeholder Plan Development and Engagement

13

13



## EFFECTIVE UTILITY MANAGEMENT (EUM) FRAMEWORK



Effective Utility Management is a  
Proven Utilities Based Framework

- Product Quality
- Customer Satisfaction
- Employee & Leadership Development
- Operational Optimization
- Financial Viability
- Infrastructure Strategy and Performance
- Enterprise Resiliency
- Community Sustainability
- Water Resource Sustainability
- Stakeholder Understanding and Support

14

14

Performance Management

## PERFORMANCE MANAGEMENT FRAMEWORK

A Balanced Perspective of Public Organization's Performance Measures



 Customer	<ul style="list-style-type: none"> <li>• Customer Satisfaction</li> <li>• Community Sustainability</li> <li>• Stakeholder Understanding and Support</li> </ul>
 Employee Learning & Growth	<ul style="list-style-type: none"> <li>• Employee and Leadership Development</li> <li>• Enterprise Resiliency</li> </ul>
 Financial	<ul style="list-style-type: none"> <li>• Financial Viability</li> <li>• Infrastructure Strategy and Performance</li> </ul>
 Internal Processes	<ul style="list-style-type: none"> <li>• Water Resource Sustainability</li> <li>• Operational Optimization</li> <li>• Product Quality</li> </ul>


15

15


FRAMEWORK

## PERFORMANCE MANAGEMENT

Goals and KPIs



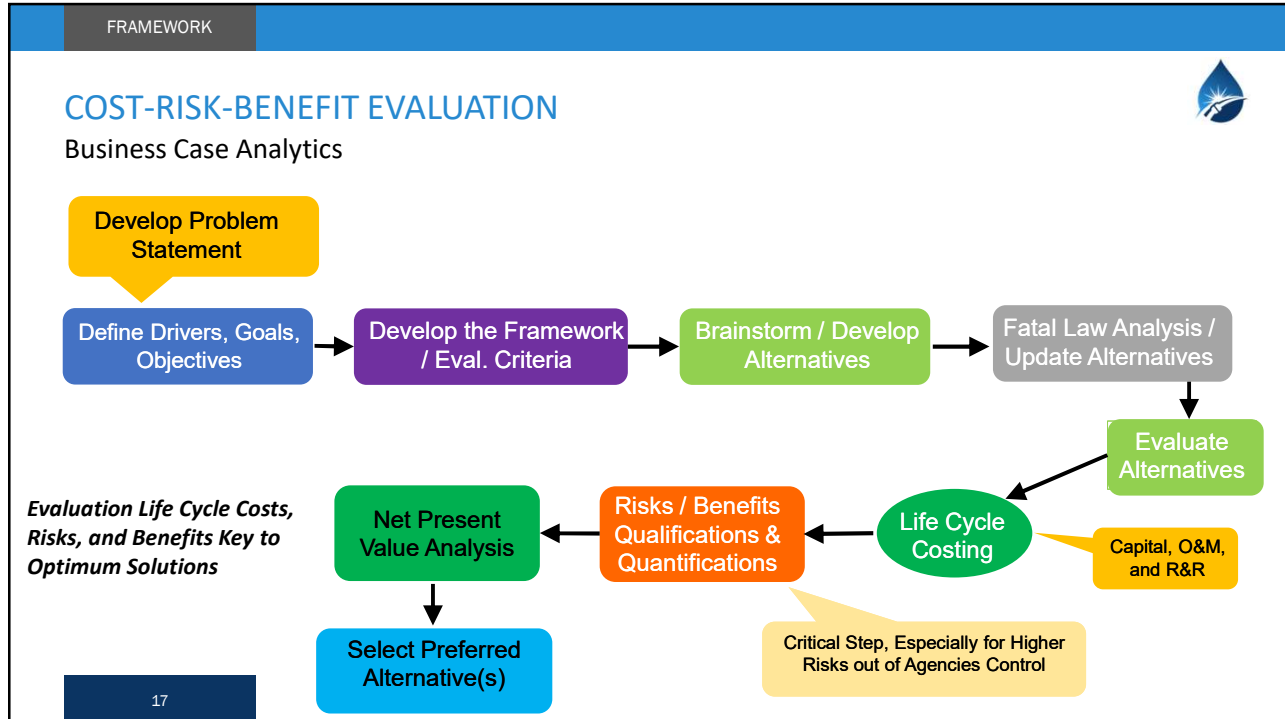
- Develop goals and corresponding KPIs to help the establish One Water program / project priorities and direction.
- Update Goals/KPI's for alignment with implementation and to track programs' / projects' progress.
- Develop Performance Metrics Definitions
  - Target
  - Description / Definition
  - Collection Method
  - Historical Data
  - Benchmarking Data
- Track performance measures via dashboards (SMART UTILITY)



16

16





17

FRAMEWORK

## ONE WATER FRAMEWORK – KEYS TO SUCCESS


Key Elements of the Approach to Follow

**Apply One Water Framework Approach Focusing on Sound Fundamentals**

- Technical
- Business
- Stakeholder Engagement

**To Achieve Local and Regional Benefits**

- Social
- Economic
- Environmental




18

18






19

CASE STUDY 1



## HERITAGE HARBOUR GOLF LODGING AND VILLA DEVELOPMENT

Manatee County, Florida

**NEWS**

**Bold plan rises for Heritage Harbour Golf Club in Bradenton**

EAST COUNTY WEDNESDAY, JAN. 6, 2020 9 months ago

SHARE f t v COMMENTS 4

Lodge and villas will create a "stay-and-play" destination to help assure the course's longterm stability.

by Jay Weather | Managing Editor

20

20

CASE STUDY 1



## PROJECT BACKGROUND

**18-hole Championship Golf Course Built in 2001**

**Master Planned Mixed-Use Community**

- Single Family
- Commercial
- Recreation

**Existing Development Regional Impact (DRI)**


**Tourism and Meeting Space**





21

CASE STUDY 1




## GOALS

**Integrated and Sustainable Solution Benefiting:**

- ✓ Golf Course (Private & Public)
- ✓ Local Community (Public)
- ✓ Manatee County (Government)
- ✓ Environment (Regional)
- ✓ Local Economy (Private and Public)

“Our success will be the community’s success, and vice versa,” he said. “This is a resurrection story of a golf course. Nationally, golf courses were once thought of as the easiest business in the world, . . . and that’s just not so. The cost of maintenance would make your chin drop. We have to figure out a formula here as to how to make this business sustainable for the long term.

“This will be a new beginning of sorts for the Heritage Harbour and Stoneybrook communities, creating several benefits for everyone living or wanting to live in this great community.”



Rule, Joy, Trammell and Rubio architects of Atlanta did renderings of how the lodge and villas could be situated.

22

# INTEGRATED APPROACH - Challenges



## Golf Course

- ✓ Address Conditions and Infrastructure of Aging Golf Course
  - Turf / Sand Traps
  - Irrigation
  - Rising O&M Costs

## Community's Needs

- ✓ Quality of Life
- ✓ Economic

## Environmental

- ✓ Ecosystem Preservation
- ✓ Water Conservation
- ✓ Water Quality
- ✓ Flood Protection



# INTEGRATED APPROACH & SOLUTIONS



Benefits – Golf Course, Community, County, Local Economy



HERITAGE HARBOR GOLF CLUB LODGING, VILLA & AMENITY EXPANSION PROJECT PRELIMINARY CONCEPT MANATEE COUNTY, FLORIDA

CASE STUDY 1



# INTEGRATED APPROACH & SOLUTIONS

Benefits – Golf Course, Community, County, Local Economy, Businesses

25

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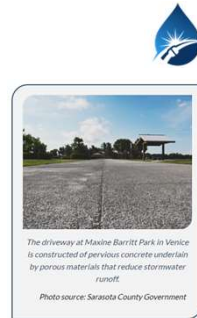
CASE STUDY 1

## INTEGRATED APPROACH & SOLUTIONS

Solution -> Low-Impact Design (LID)



<https://sarasota.wateratlas.usf.edu/lid/#green-infrastructure-home>




26


<https://www.epa.gov/green-infrastructure/green-infrastructure-design-and-implementation>

26

CASE STUDY 1

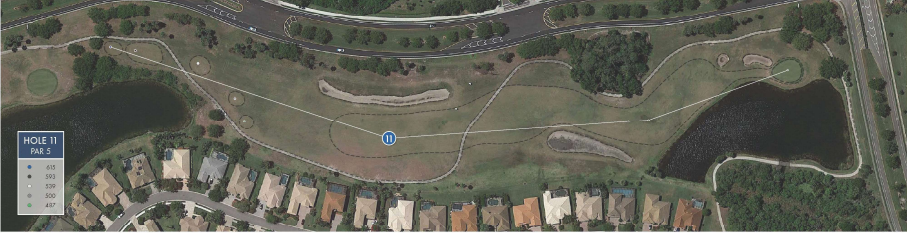


CONCEPT OVERVIEW




**INTEGRATED  
APPROACH  
&  
SOLUTIONS**

**ONE WATER**



EXISTING CONDITIONS



PROPOSED CONDITIONS

**BENEFITS**

- Water Quality
- Water Conservation
- Flood Protection


27


27

CASE STUDY 1

**INTEGRATED APPROACH & SOLUTIONS**


Benefits – Environment





HERITAGE HARBOUR  
HOLES 11-18  
TURF REDUCTION PLAN  
APRIL 12, 2019

HOLE	GRY TURF REDUCED
11	79,812 SF / 1.84 AC
12	84,432 SF / 1.94 AC
13	6,240 SF / 0.14 AC
14	47,280 SF / 1.07 AC
15	100,200 SF / 2.31 AC
16	36,287 SF / .81 AC
17	30,288 SF / .69 AC
18	90,288 SF / 2.06 AC
TOTAL	501,727 SF / 11.48 AC



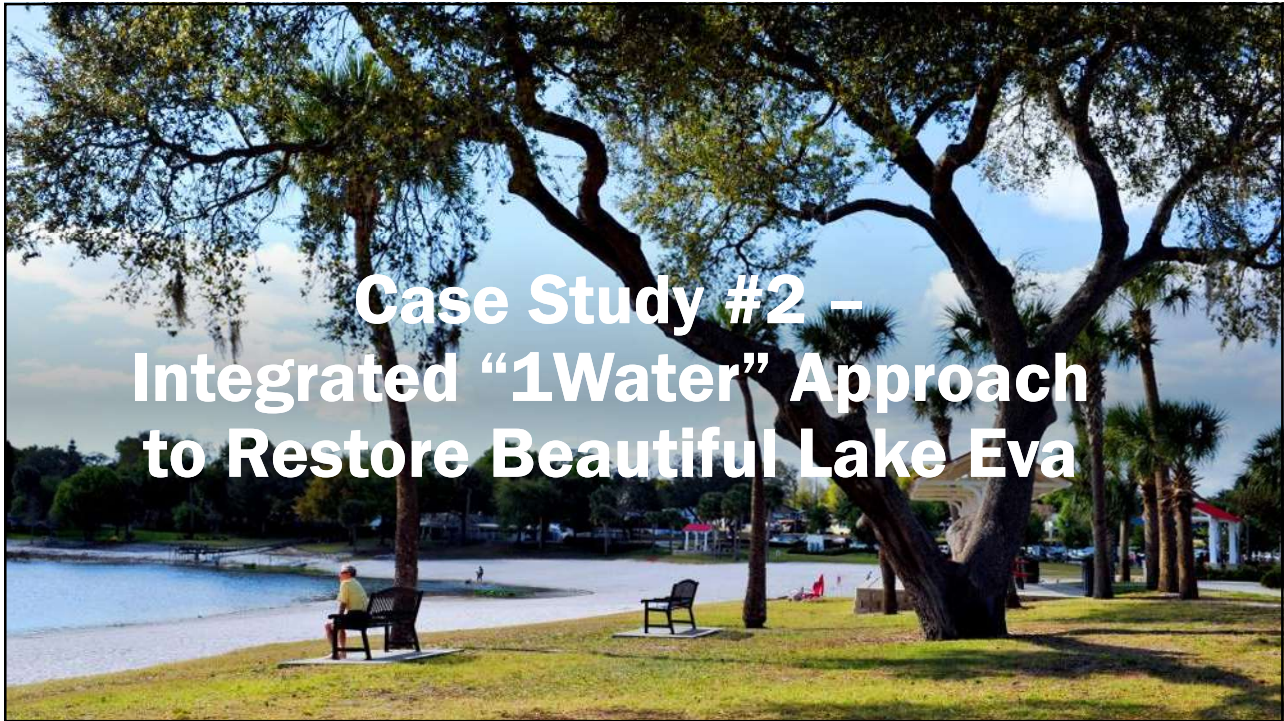
HERITAGE HARBOUR  
HOLES 1-10  
TURF REDUCTION PLAN  
APRIL 12, 2019

HOLE	GRY TURF REDUCED
1	48,720 SF / 1.11 AC
2	175,200 SF / 3.98 AC
3	142,800 SF / 3.24 AC
4	130,800 SF / 2.97 AC
5	140,280 SF / 3.18 AC
6	93,240 SF / 2.12 AC
7	222,000 SF / 5.04 AC
8	82,740 SF / 1.87 AC
9	48,720 SF / 1.11 AC
10	42,720 SF / .95 AC

- ✓ **Water Quality** Improvements through Nutrient Reduction (N & P)
- ✓ **Water Conservation** through less Irrigable Turf & Native Xeriscape Plants & Trees
- ✓ **Flood Protection & Ecosystem Restoration**

28

28




29









30

CASE STUDY 2

## PROJECT OBJECTIVES



-  Address Lake Eva **Minimum Flow and Level (MFL)** and SWFWMD guidance levels
-  Improve **water quality** in Lake Eva
-  Improve **flood protection** in the vicinity of Lake Henry, while protecting water recreation opportunities
-  Improve **groundwater recharge** and potentially obtain water supply credits from SWFWMD
-  **Natural systems** enhancement/improvement




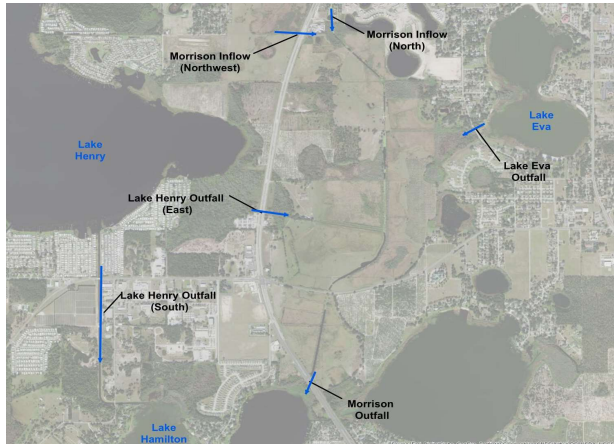
Lake Eva 2011

31

31

CASE STUDY 2

## EXISTING CONDITION MODEL RESULTS

**Project Area Water Availability – Average Annual**

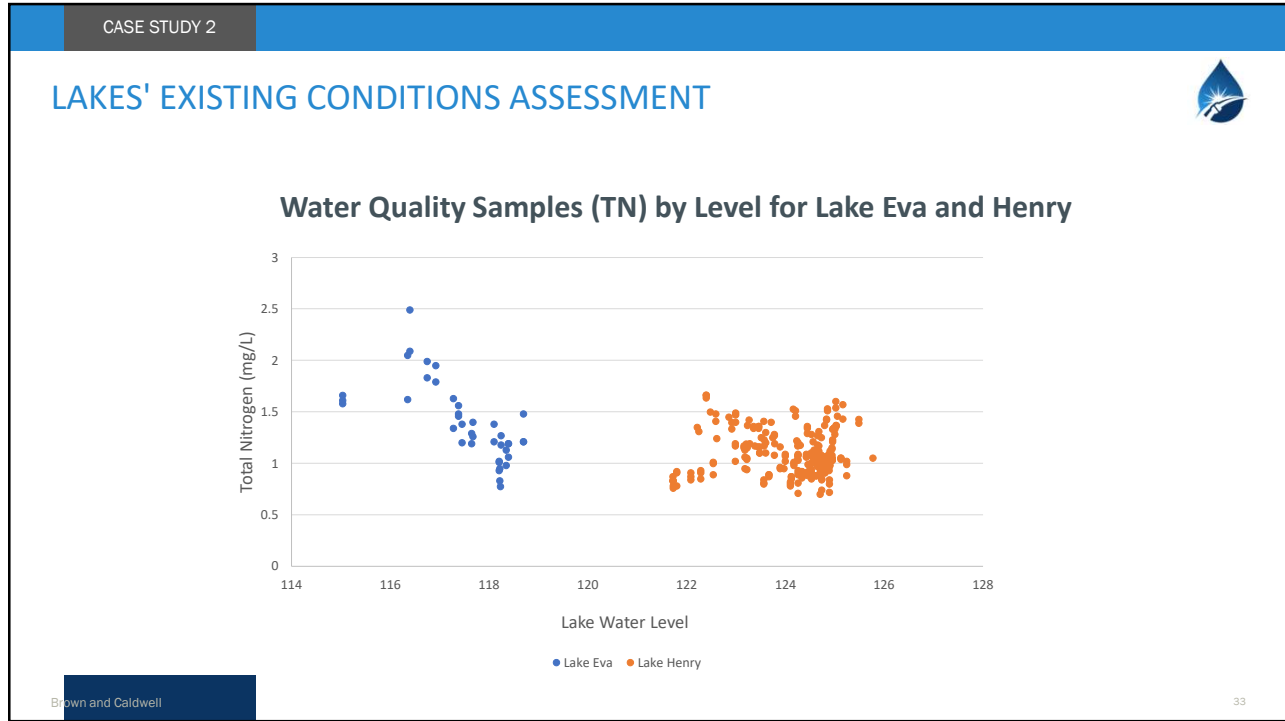
Water Availability in the Lake Eva - Lake Henry Study Area Based on ICPR Modeling Results (average annual water volume from 6/1/2002 to 5/31/2016)

Lake Eva Outfall (West to Morrison) Ac-ft/yr	Lake Henry Outfall (South to Hamilton) Ac-ft/yr	Lake Henry Outfall (East to Morrison) Ac-ft/yr	Morrison Outfall (South to Hamilton) Ac-ft/yr	Morrison Inflow (from North) Ac-ft/yr	Morrison Inflow (from Northwest) Ac-ft/yr
0	213	413	2,752	1,661	91

32

32





33

CASE STUDY 2

## COLLABORATIVE PROCESS FOR CRITERIA PRIORITIZATION

**Evaluation Criteria and Priority**  
*City / District / BC Team Final Prioritization Meeting - January 14, 2019*

Selection Criteria	Priority	Description
Improve Lake Eva Water Quality	1	Achieve Lake Water Quality Improvement for Key Parameters including Total Phosphorus and Chlorophyll-a
Address Lake Eva Low Water Level Concerns	2	Address Regulatory Requirements for Maintaining Minimum Level and Flow (MFL) in Lake Eva
Meet Regional Integrated Water Resources Needs including Groundwater Recharge and Water Supply Credits	3	Follow Central Florida Water Initiative (CFWI) guidelines, use regional approach to solving multi-jurisdictional "One Water" needs. Infiltrate "Excess" Water into project area groundwater system with the goal of generating water supply credits
Minimize Need for Land Acquisition and Easements / Utilize Existing Infrastructure & Natural Conveyances	4	Maximize the use of existing public lands and easements for project improvements and minimize the need to acquire additional private land or easements. Maximize natural conveyance and maintain existing drainage system infrastructure in such a way that it's compatible with maximizing natural conveyance.
Public / Stakeholder Acceptance	5	Consensus of acceptance by Stakeholders, Residences, and Businesses
Life-Cycle Cost	6	Lowest combined Capital and O&M Costs for 20-year life
Provide Natural Systems Enhancement, Recreational Benefits, Social Benefits	7	Improve ecosystem form and function within the project area. Maintain or improve Lake Recreational Benefits (Swimming, boating, fishing, etc.). Provide public benefits such as increased property value, economic development, educational opportunities, aesthetics, etc.
Reduce Lake Henry Flooding During Wet Weather Periods	8	Reduce extent/depth of flooding for residents adjacent to Lake Henry for the 100-year, 24-hour event based on existing flood maps
Minimize Impacts (temporary/permanent) to residences and businesses	9	Construction and Operation of Proposed Improvements has minimal impact on residences and businesses
Likelihood or Ease of Permitting	10	Regulatory Acceptability and Less Time/Lower Cost for Project Permitting
Proven Treatment/Recharge Approach	11	Use project elements which are effective and meet regulatory requirements

Blown and Caldwell

34

34

## LAKE EVA and LAKE HENRY RESTORATION CONCLUSIONS



- Model results show there is sufficient water (avg. basis) reaching Morrison Ranch property (project area) to evaluate alternatives to meet project objectives
- No need to alter Lake Henry water inflow, elevation or water quality
- Flooding in the vicinity Lake Henry appears to be limited
- Statistical Analysis indicates Lake Eva WQ improves at higher lake levels
- Options to improve Lake Eva water quality include wetland treatment (west), LIDs (north and east), and Pretreatment (Alum)
- Areas exist for wetland rehydration and enhancement
- Options to improve Lake Eva water level include improving conveyance systems and storing/rerouting inflows from North

## CONCLUSIONS



Integrated 1Water  
Engineering / Business  
Approach to Solving FL  
Resource Water Challenges

1. Think Holistically to Address Water Resource Challenges (1Water)
2. Define the Problem Before Developing Solutions
3. Develop the Framework and Engage Stakeholders
4. Integrate Business Case Analysis & Risk Management w/Technical



37