



Integrated Stormwater Planning

Stormwater as a Resource

May 12, 2021 / 11:00 a.m. - 12:00 p.m. (Eastern)

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Today's Presenters



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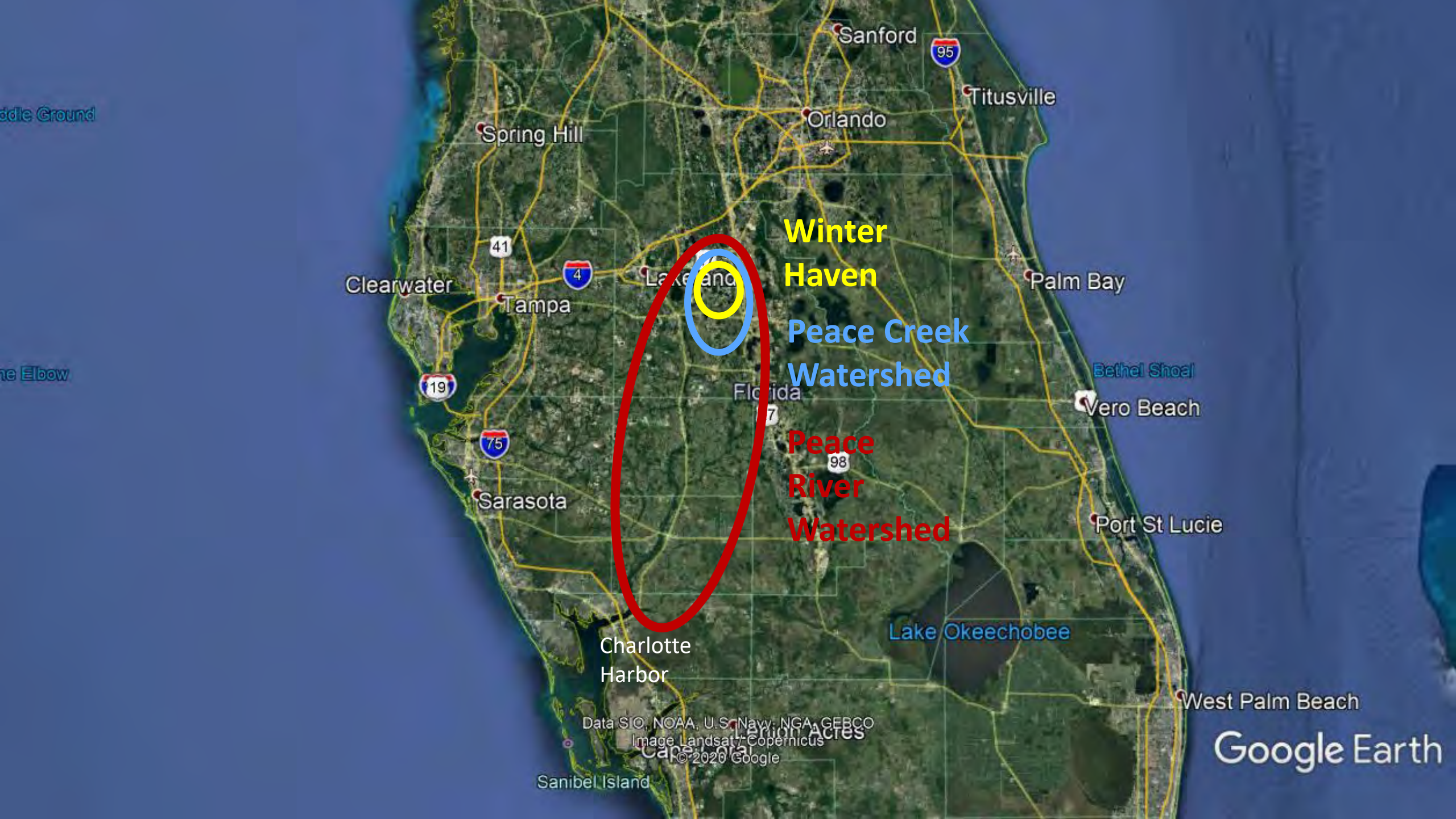
WINTER HAVEN
The Chain of Lakes City

Integrated Stormwater Planning - Stormwater as a Resource

May 12, 2021



BLACK & VEATCH

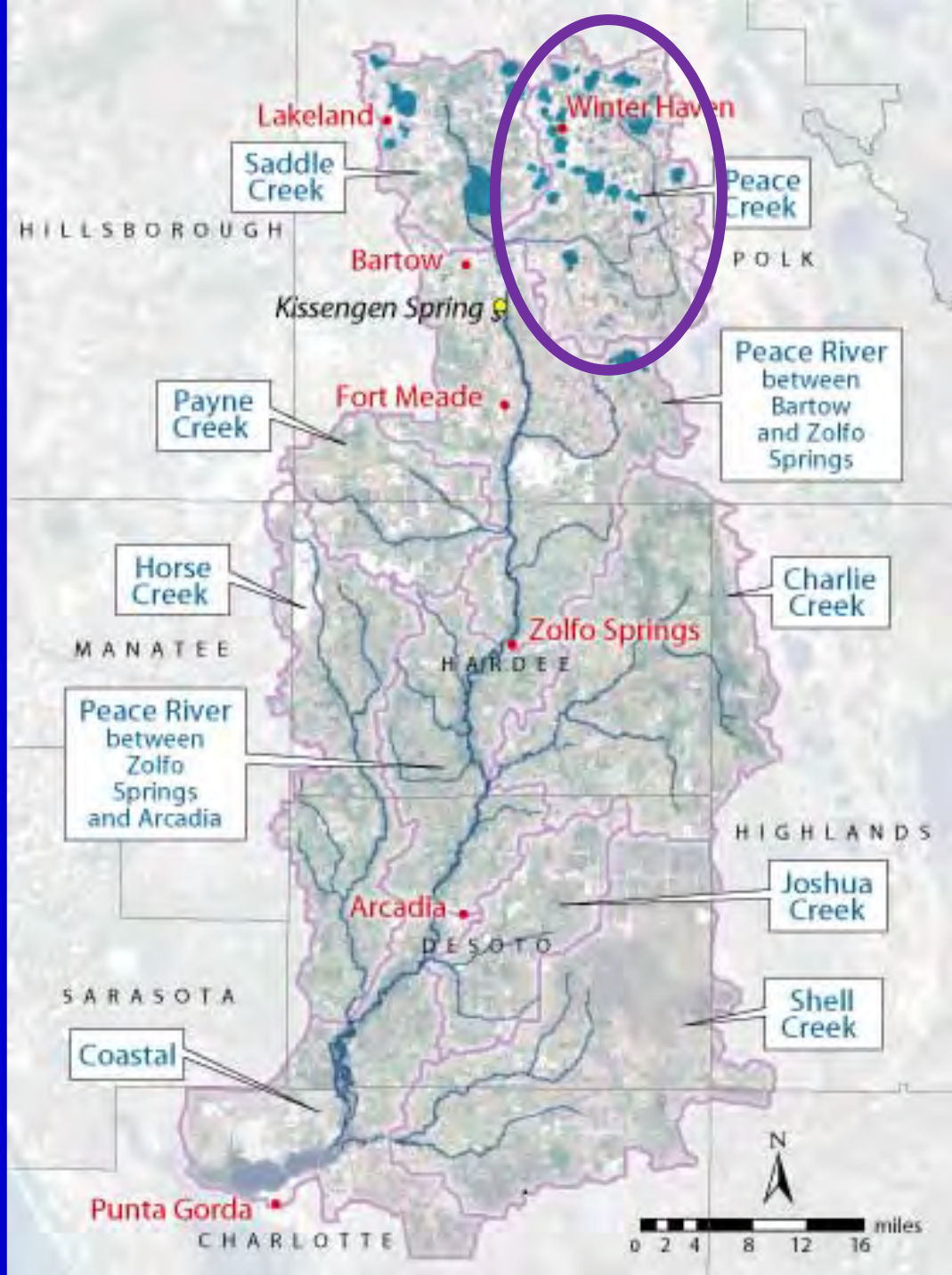


Winter Haven

Peace Creek Watershed

Peace River Watershed

Peace River/Peace Creek Watershed



Peace Creek Canal

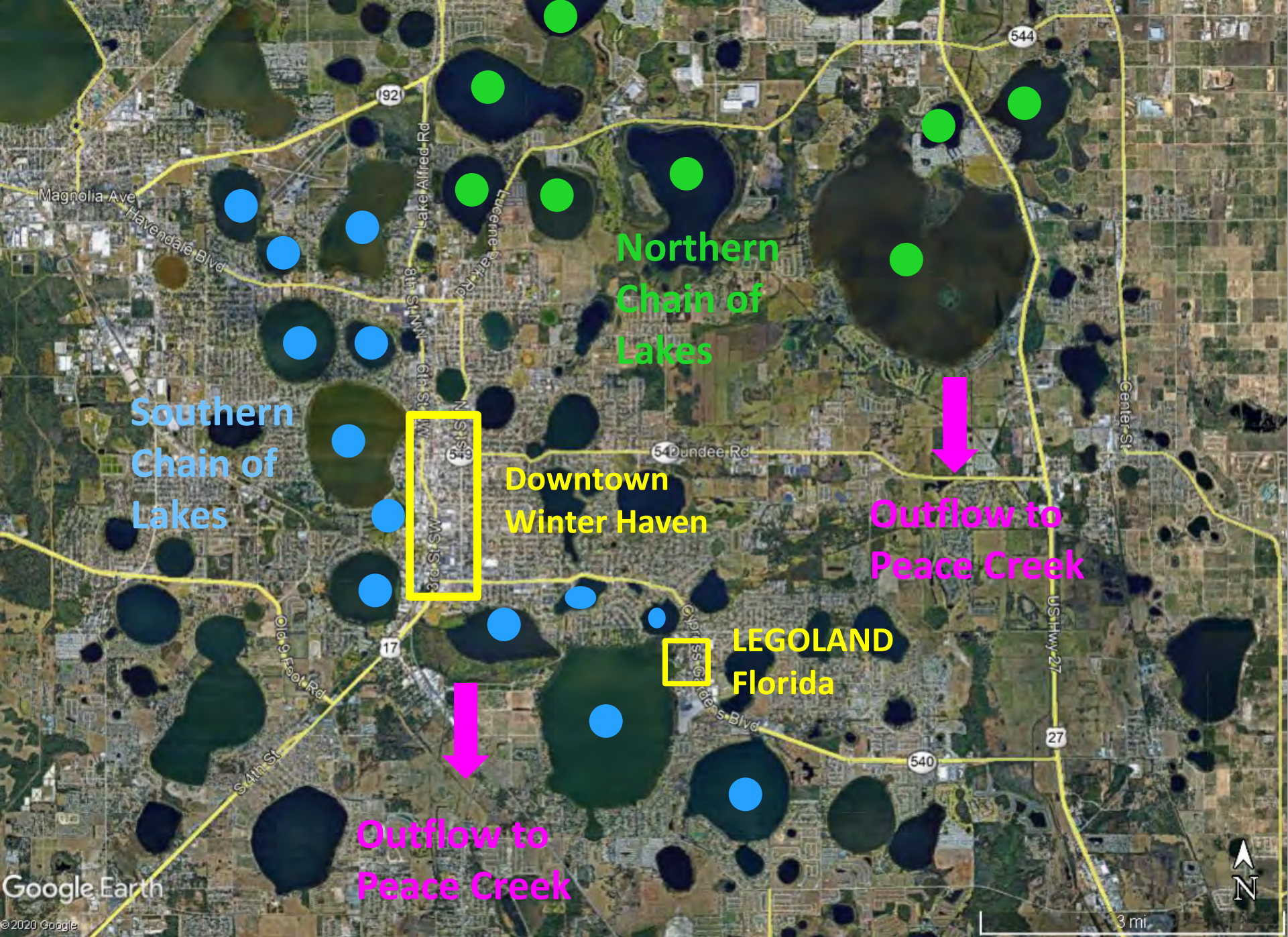


0 0.75 1.5 3 4.5 6 Miles

- Drainage Canals
- WH City Limits
- Peace Creek Basin

WINTER HAVEN
The Chain of Lakes City





Northern
Chain of
Lakes

Southern
Chain of
Lakes

Downtown
Winter Haven

LEGOLAND
Florida

Outflow to
Peace Creek

Outflow to
Peace Creek

May 1980 Potentiometric Surface of the Florida Aquifer in Peninsular Florida

Modified from Fisk (1983) and Johnson, Healy and Hayes (1981)



Ground-Water Basins (GWB)

Potentiometric Contour

Northern West-Central Florida GWB

Central West-Central Florida GWB

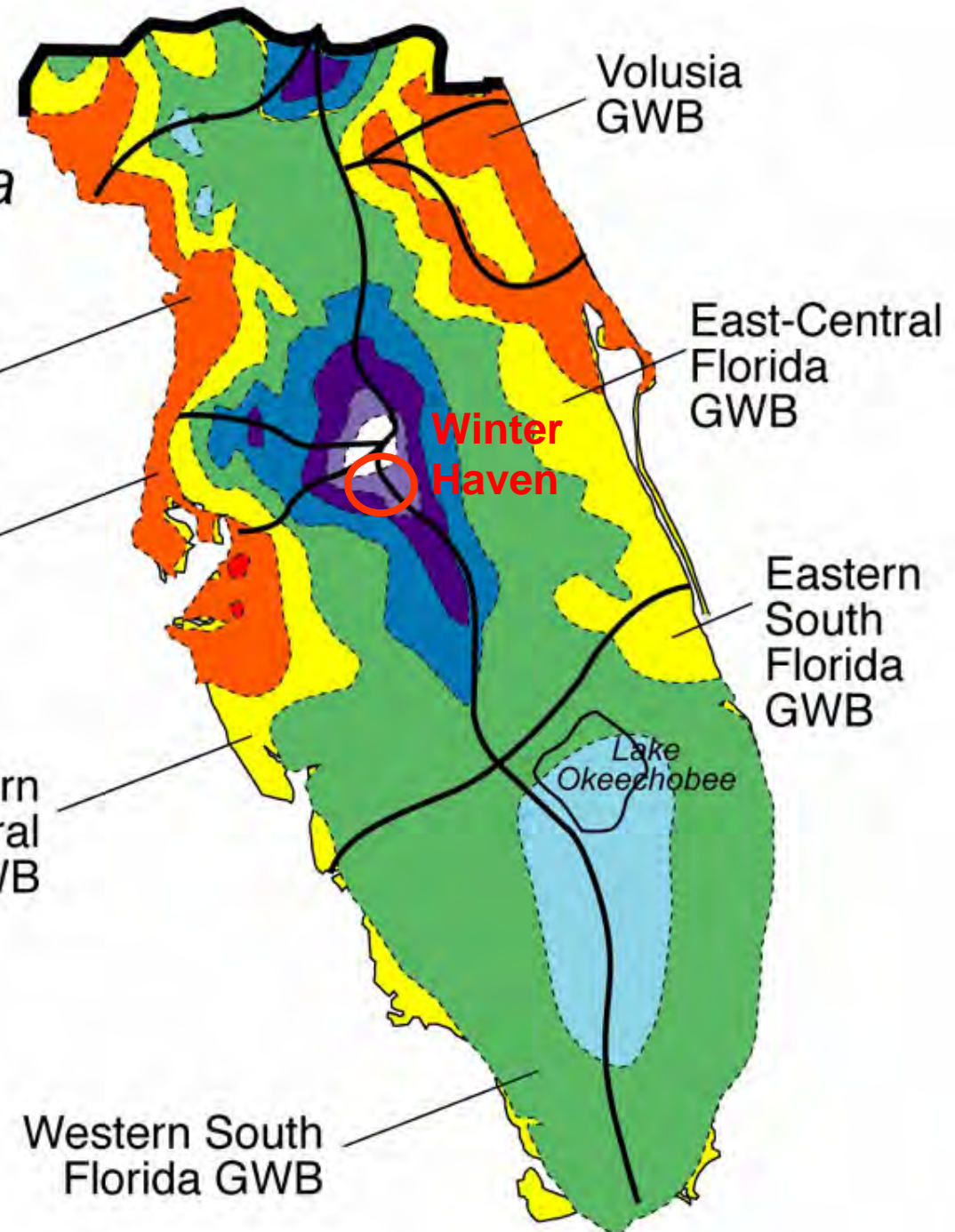
Southern West-Central Florida GWB

Western South Florida GWB

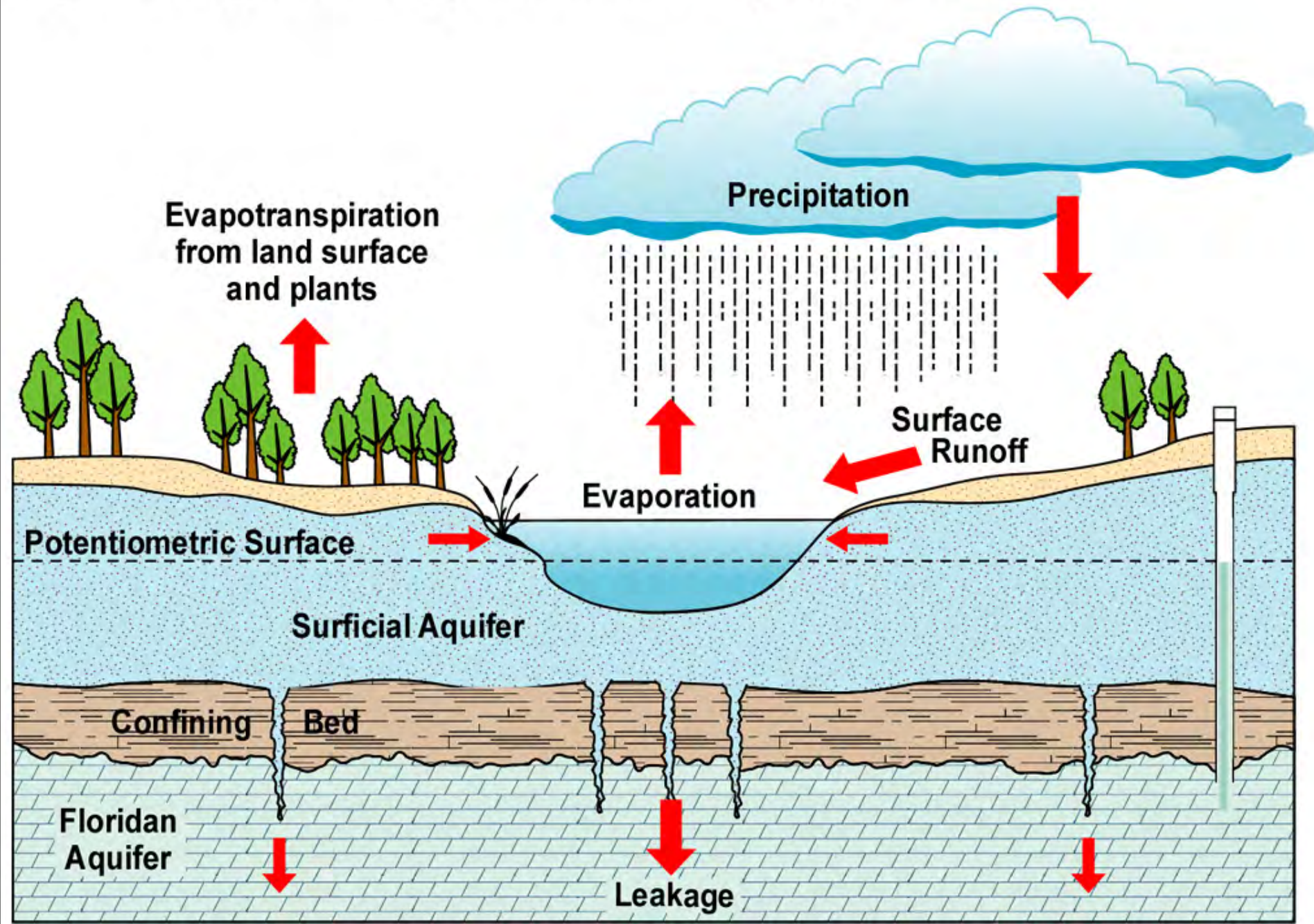
Volusia GWB

East-Central Florida GWB

Eastern South Florida GWB

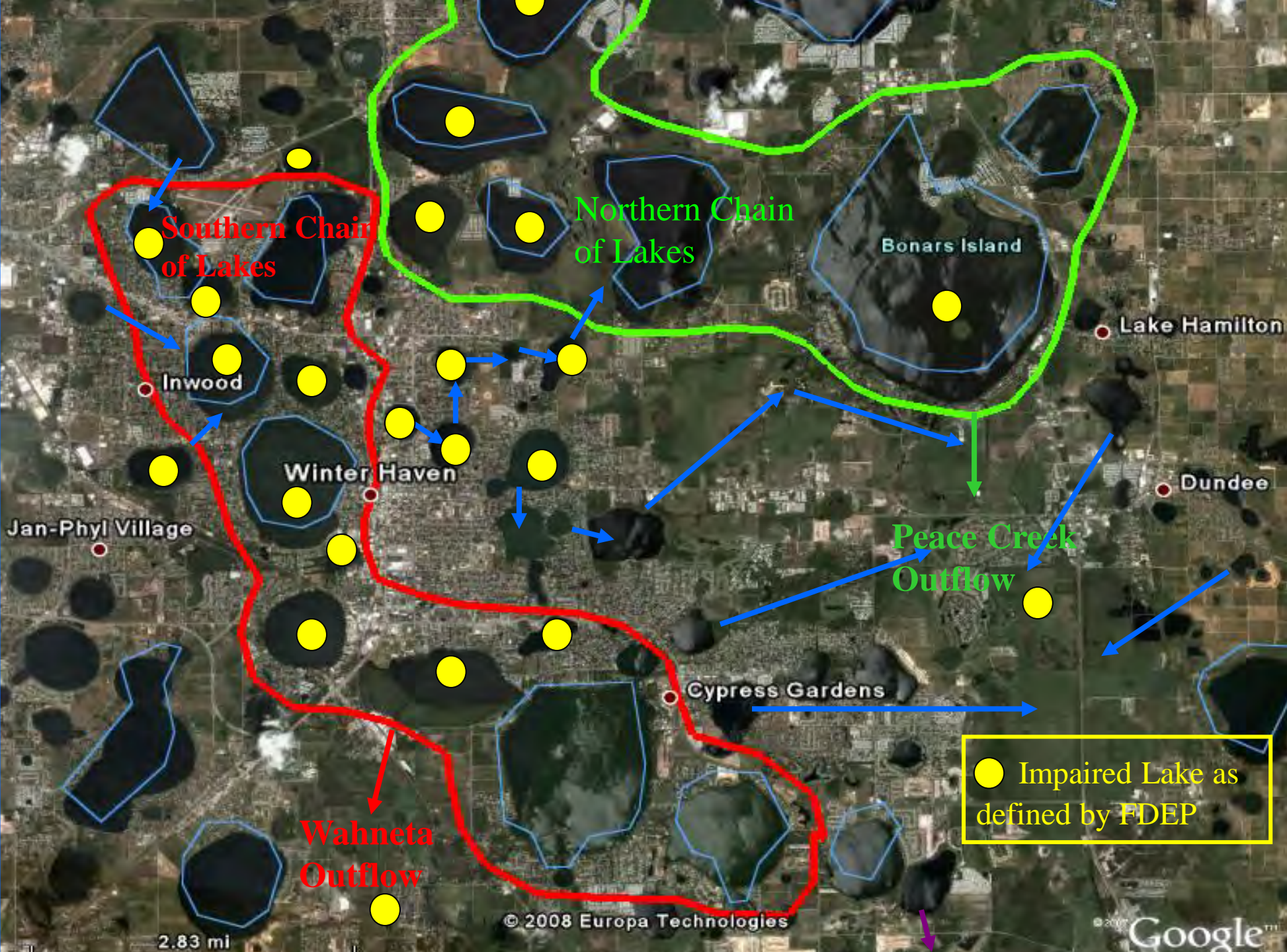


Hydrologic Budget for a Seepage Lake









Southern Chain of Lakes

Northern Chain of Lakes

Bonars Island

Lake Hamilton

Inwood

Winter Haven

Dundee

Jan-Phyl Village

Peace Creek Outflow

Cypress Gardens

Wahneta Outflow

● Impaired Lake as defined by FDEP

2.83 mi

© 2008 Europa Technologies

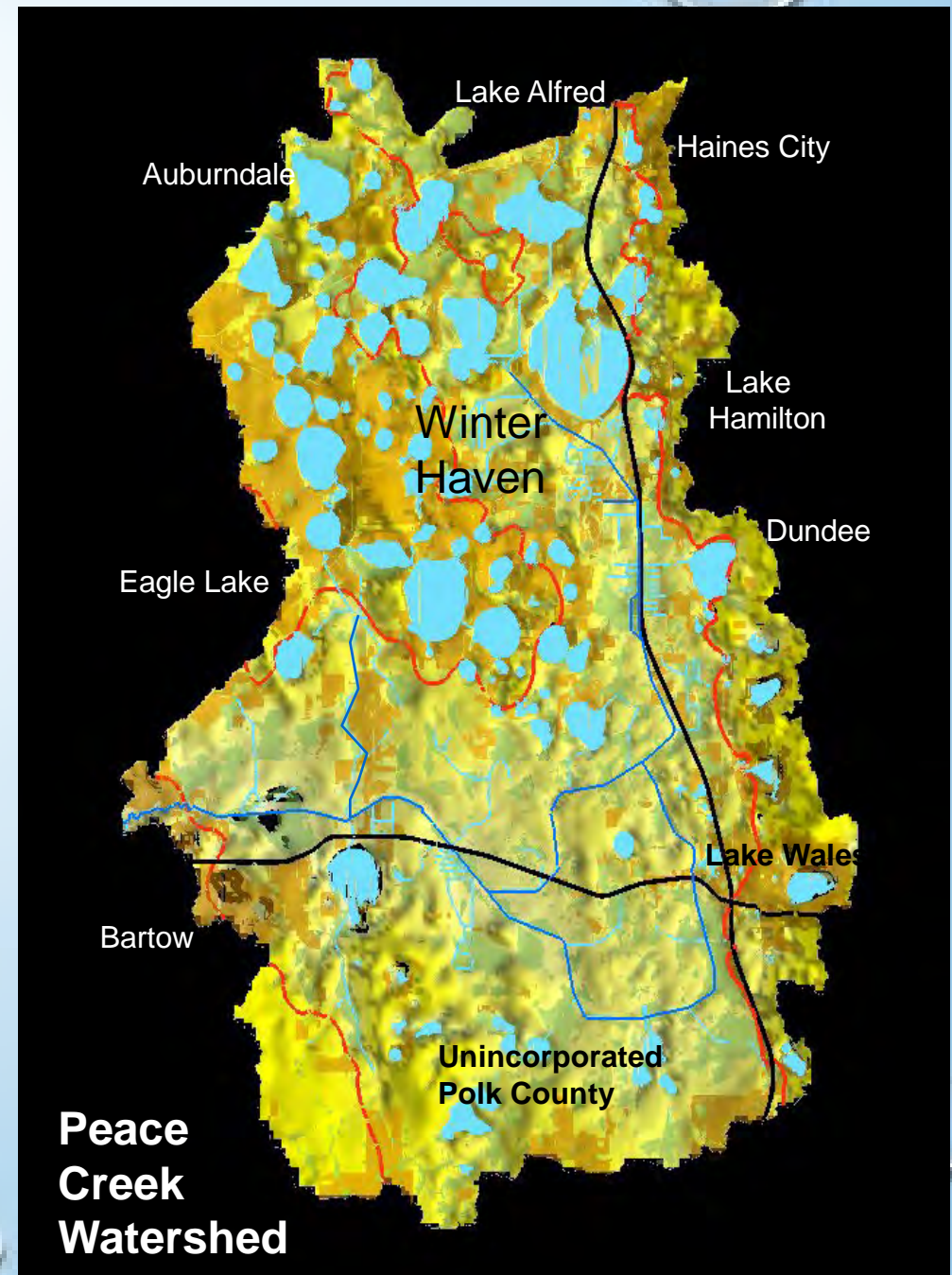
Google™

Current Peace Creek Watershed Impacts:

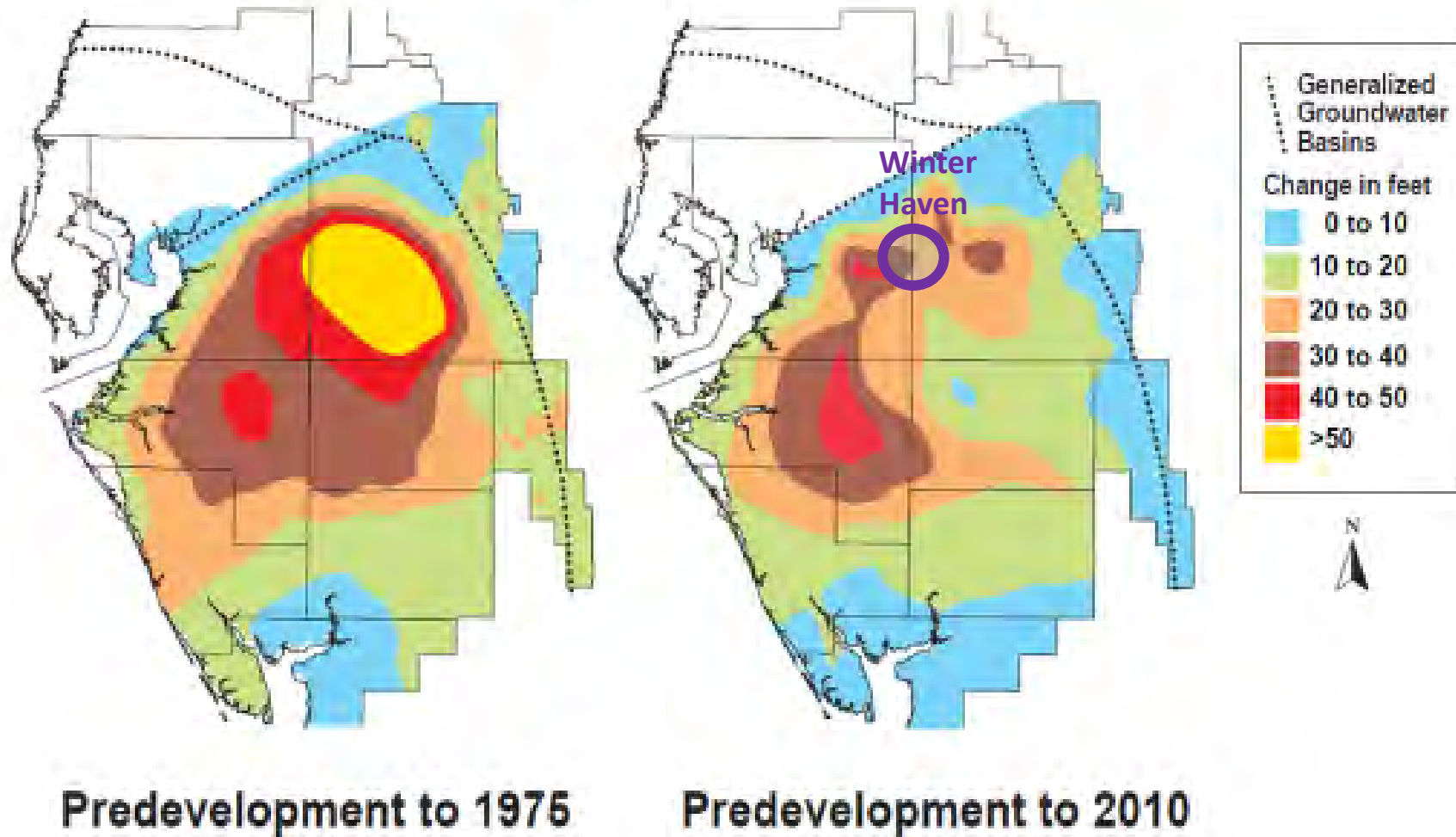
- Drainage Ditches
- Urbanization
- Regional and Local Pumpage



WINTER HAVEN
The Chain of Lakes City



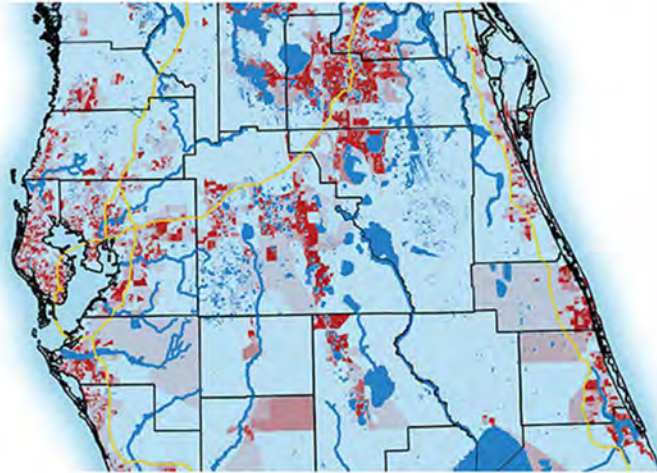
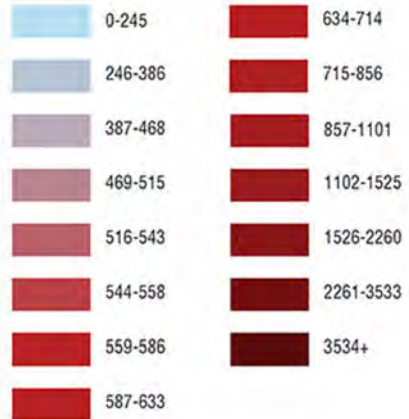
Long Term Changes in the Potentiometric Surface of the Upper Floridan Aquifer



Peace Creek
Drainage Canal:
Perpetually
Drains the
Watershed, but
Provides Limited
Flood Control

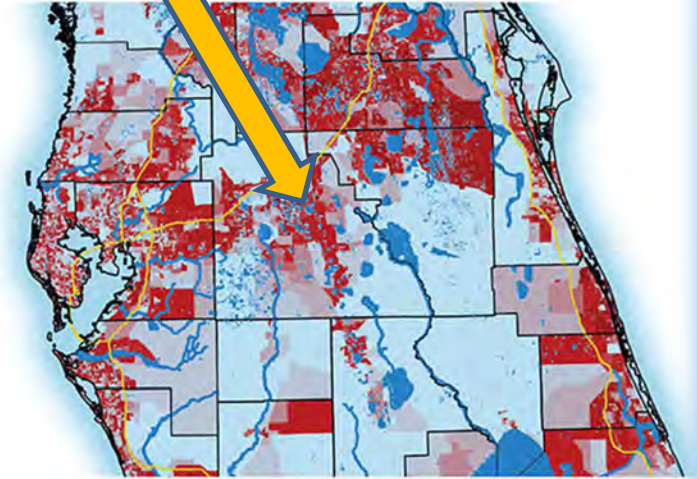
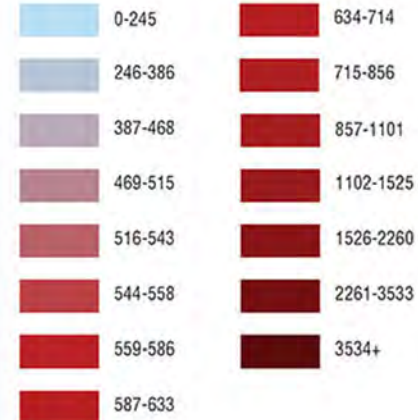


Winter Haven



Central Baseline

(Total demand by census block in gallons per day per acre)



Central Trend

(Total demand by census block in gallons per day per acre)



A joint project of...



This map uses a mathematically-generated geometric scale to better visualize the results due to the wide range in values. Each category has roughly the same number of data entries.

November 2016



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November 2016

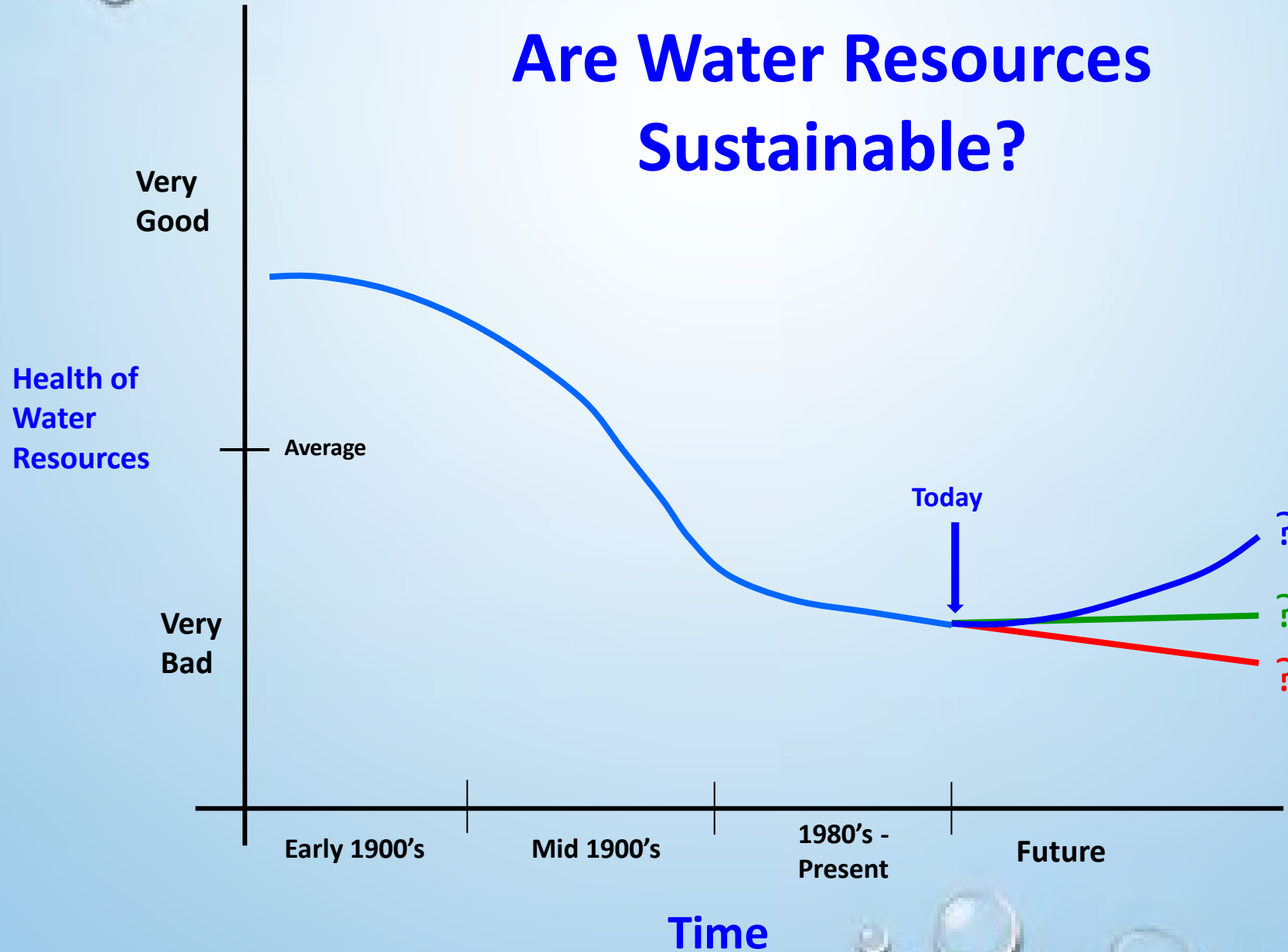
Four Stormwater Wetland Treatment Storage Nature Parks



Implementation: 43 Raingardens to Date



Are Water Resources Sustainable?

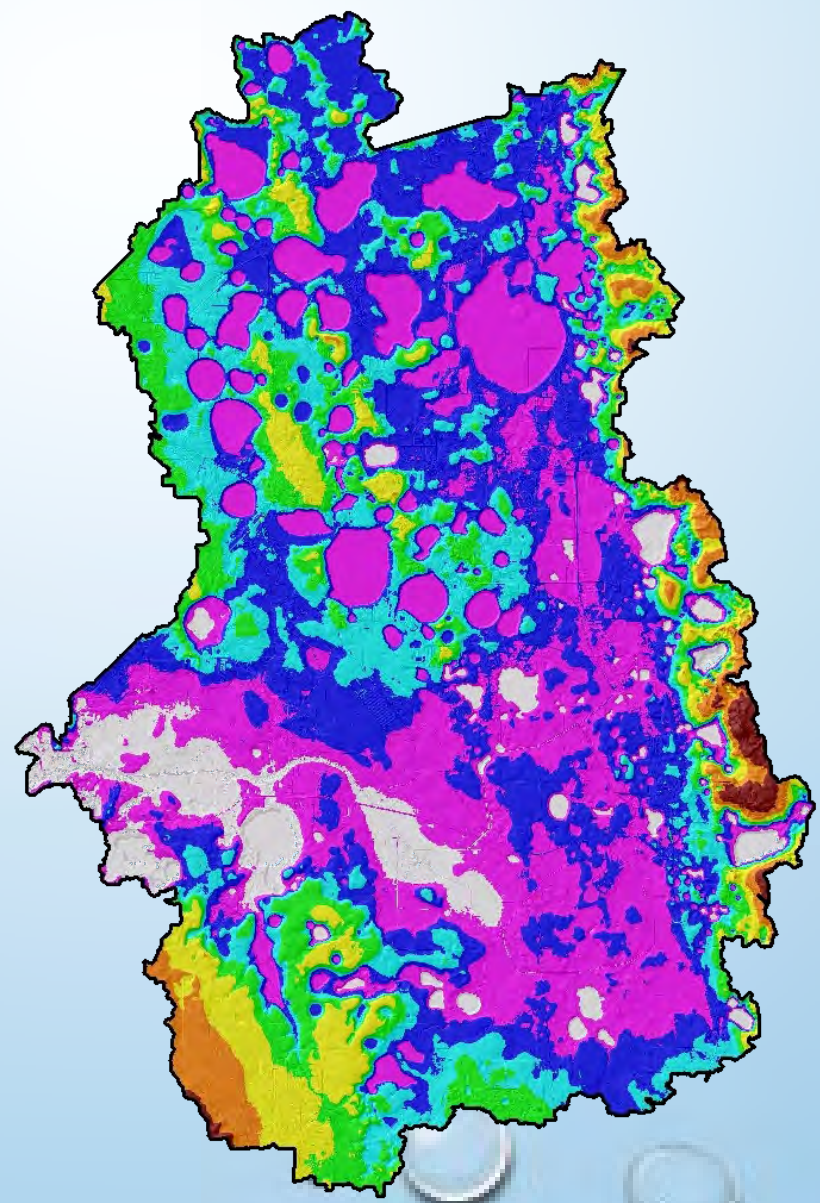


Natural Functions of Peace Creek Watershed

- 2005 Polk LiDAR dataset
- Max Elevation = 297 ft NAVD88
- Min Elevation = 49 ft NAVD88

**Peace Creek Terrain
Ft NAVD88**

White	49.3 - 109
Magenta	110 - 122
Blue	123 - 135
Cyan	136 - 148
Green	149 - 164
Yellow	165 - 183
Orange	184 - 212
Brown	213 - 297



***Natural Functions of
The Peace Creek
Watershed:***

Ridge Areas:

Infiltration/Recharge

Polk Upland/Valley

Areas:

Storage/Treatment



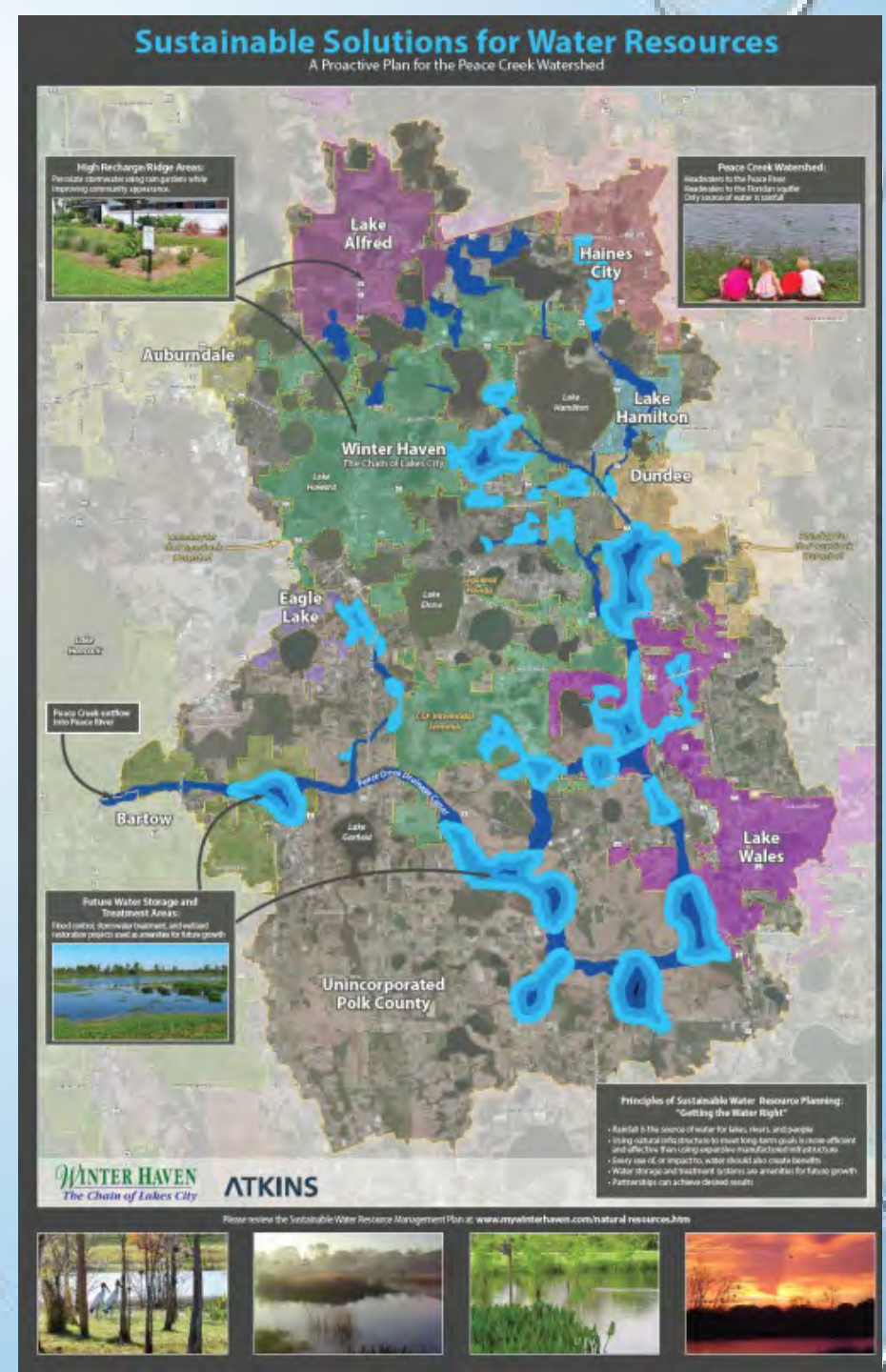


Future by Design Community Vision (2000):
"Water benefits all aspects of our *Economy,*
Culture and Environment"



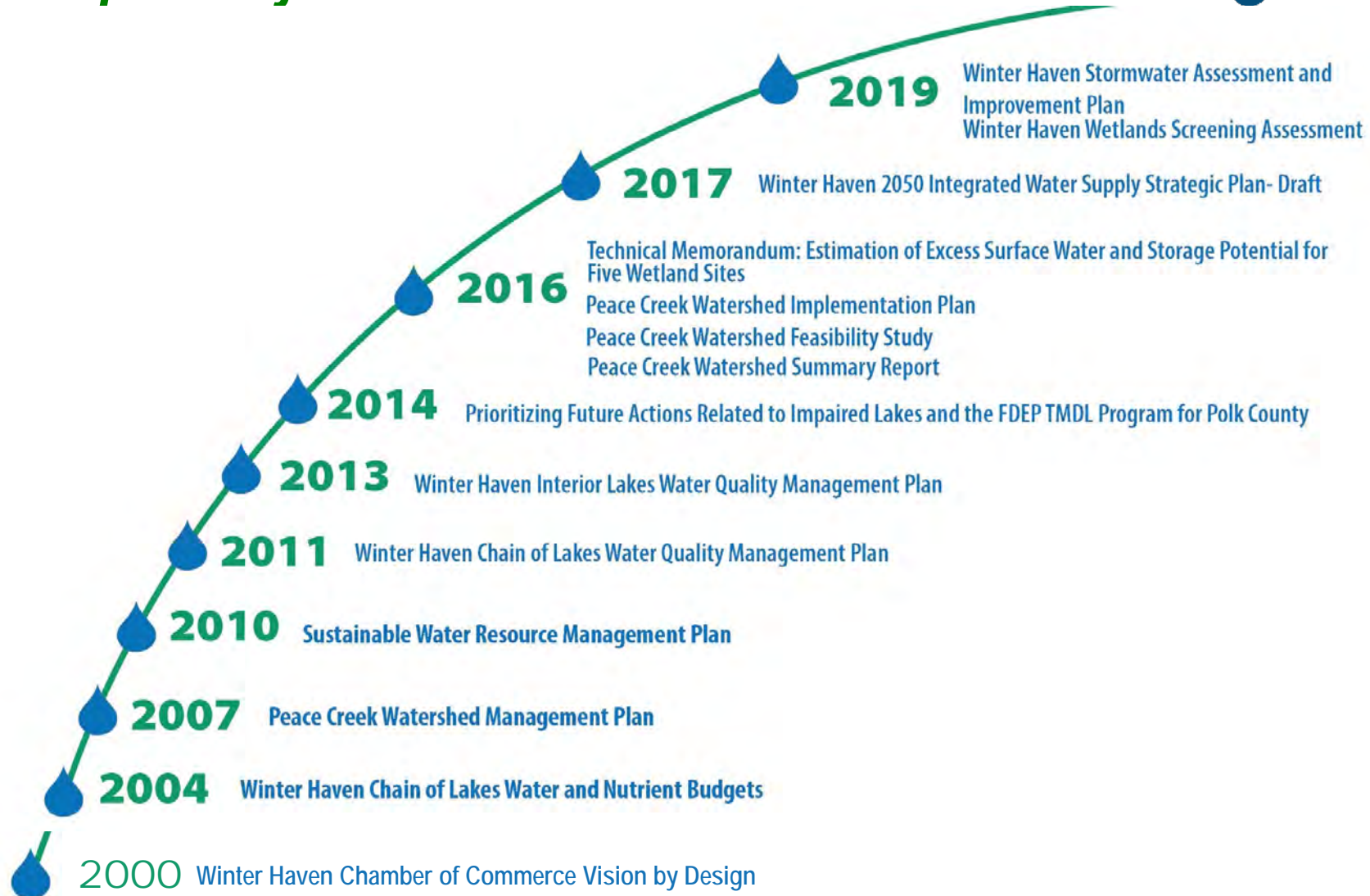
December, 2010 Winter Haven's Sustainable Water Resource Management Plan

- Adopted by City Commission
- “Under the Current Approach, Water is not Sustainable”
- Store More Water in Headwaters
- Restore Natural Wetland Storage
- Multiple Benefit/Natural Infrastructure Approach



Winter Haven is prepared:

To distinguish itself as a community that values all aspects of water.

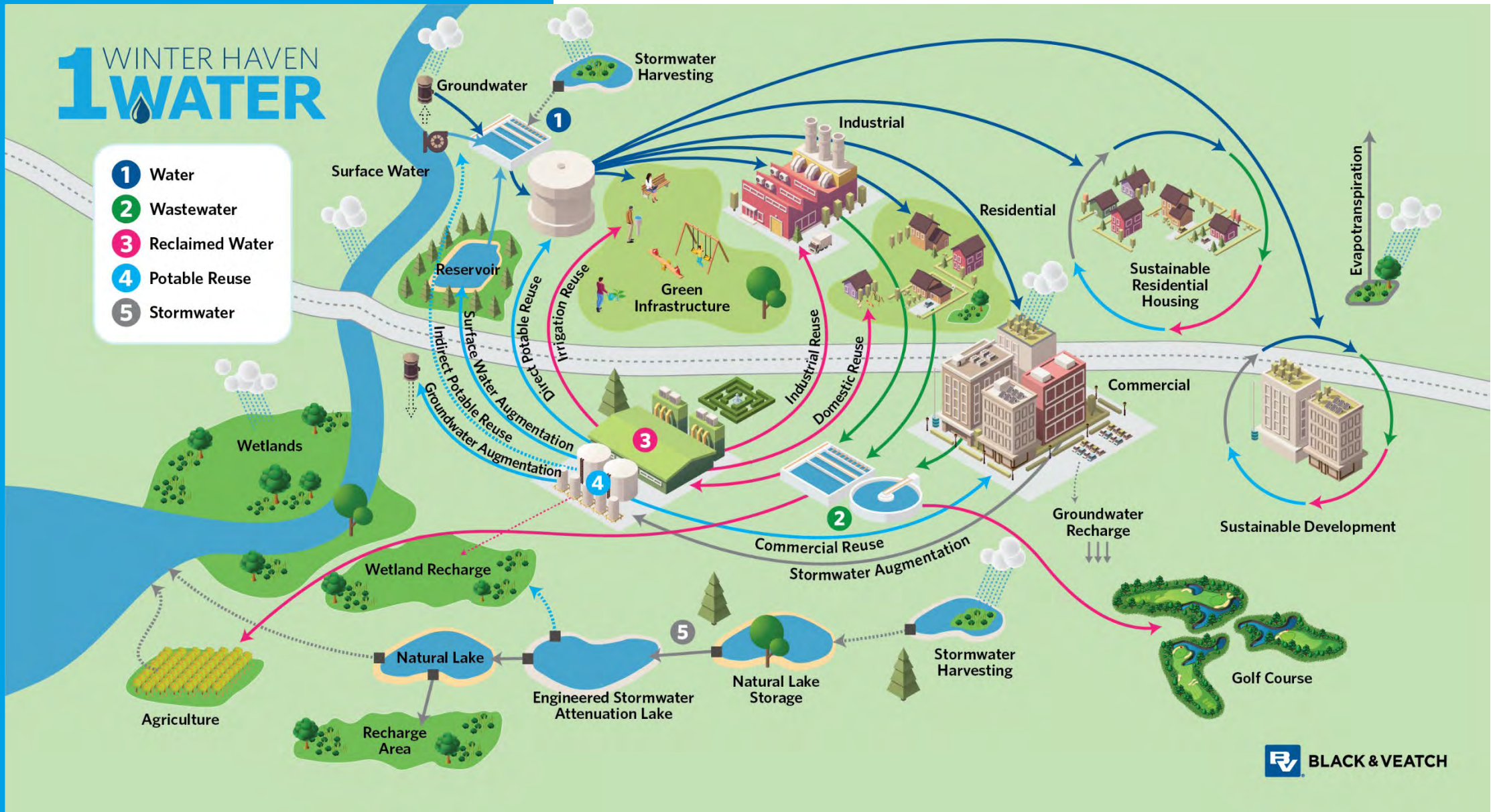


WHERE IS THE WATER?



- Freshwater lakes and rivers
- Liquid fresh water
- Water in, on, and above the earth

Integrated/One Water Approach



To Meet Current Challenges – One Water Shifts How We Manage Our Water Resources



Winter Haven

One Water Vision – To be a vibrant, innovative community embracing a One Water culture that promotes responsible stewardship of social, environmental and economic resources.



Winter Haven

One Water Definition: 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.

Winter Haven

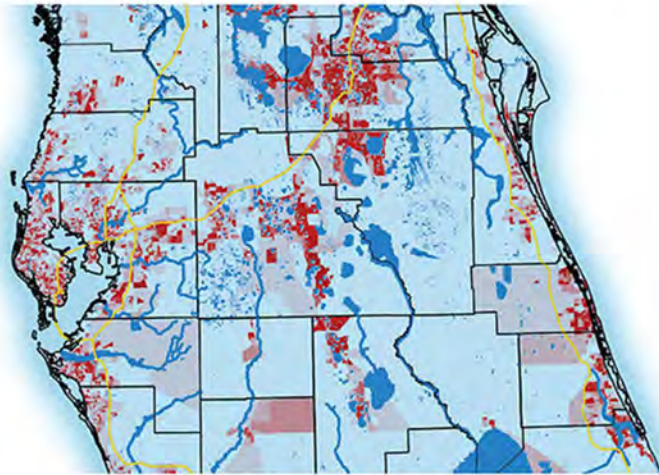
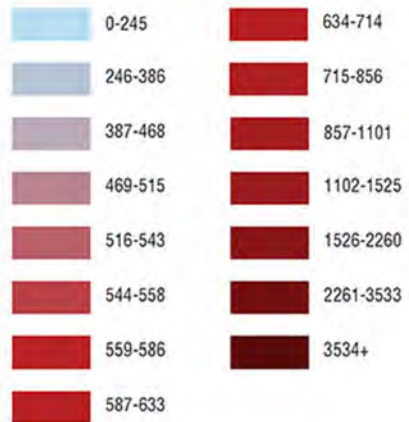
One Water Revelation: The character and quality of our natural systems directly indicate the availability of resources to support our social, economic and built environment needs

WINTER HAVEN
1 WATER



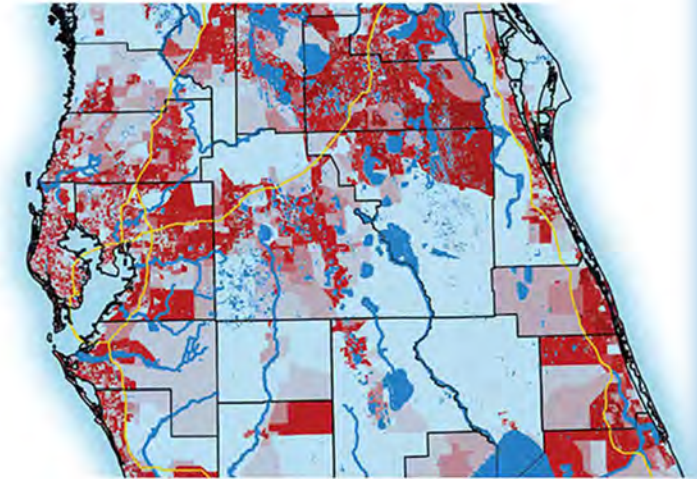
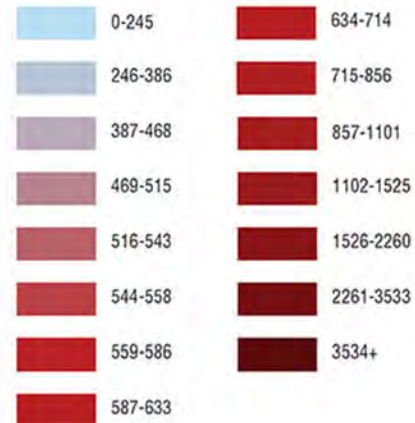
Winter Haven One Water Master Plan





Central Baseline

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Central Trend

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November 2016

It all starts with **WATER**



1 WINTER HAVEN
WATER

 **The Ledger**

Polk ranks among nation's fastest-growing metro areas

By Sara-Megan Walsh
Posted Apr 23, 2019 at 5:58 PM
Updated Apr 24, 2019 at 9:18 AM

Lakeland-Winter Haven's 3.2% annual population increase trailed just Midland, Texas; Myrtle Beach-Conway area of the Carolinas; and St. George, Utah.

LAKELAND — Polk County's population grew fast enough last year to fill every seat in the RP Funding Center's George Jenkins Arena, Jaker Marchant Stadium and still leave a crowd for Thomas Bryant Stadium, according to U.S. Census data.

More than 22,000 people moved to the Lakeland-Winter Haven metropolitan area from July 1, 2017 to July 1, 2018, according to the U.S. Census Bureau. The 3.2% annual population increase earned it the fourth spot on U.S. Census's Top 10 Metropolitan Areas in Percentage Growth list. The area was outpaced only by Midland, Texas; Myrtle Beach-Conway area of the Carolinas; and St. George, Utah.

"It's not that surprising, this is a super nice place to live," Winter Haven Mayor Brad Dantzier said. "The roads are more crowded than they've ever been and the restaurants are harder to get into. We've seen everything that goes along with a larger population."

Sean Malott, president and CEO of the Central Florida Development Council, said that the county is experiencing tremendous growth along its Interstate 4 corridor, particularly in the northeast.

"People are locating to Polk County that want to have access to the Tampa and Orlando job markets while being able to afford more home and more conveniences," he said.

Deric Feacher, the city manager for Haines City, said he has certainly seen "a large influx" as the city issued 126 permits for construction of single-family homes last month. Three years ago, he said there were roughly four builders active in the city where now there are 14 different companies who have invested in more than 40 construction projects.



Comprehensive Approach

- **Public engagement - Communications/Stakeholder Plans**
- **Water Conservation Plan**
- **Water, Wastewater, and Reuse Master Plans**
- **Master Planning for stormwater and restoration**
- **Hydrologic Model & Optimization**
- **Cost/Benefit Analysis of Nature-Based Solutions**
- **Future Land Use Planning**
- **Funding Strategies and Support**
- **Economic Evaluation Framework & Tool**

Economic Evaluation Framework

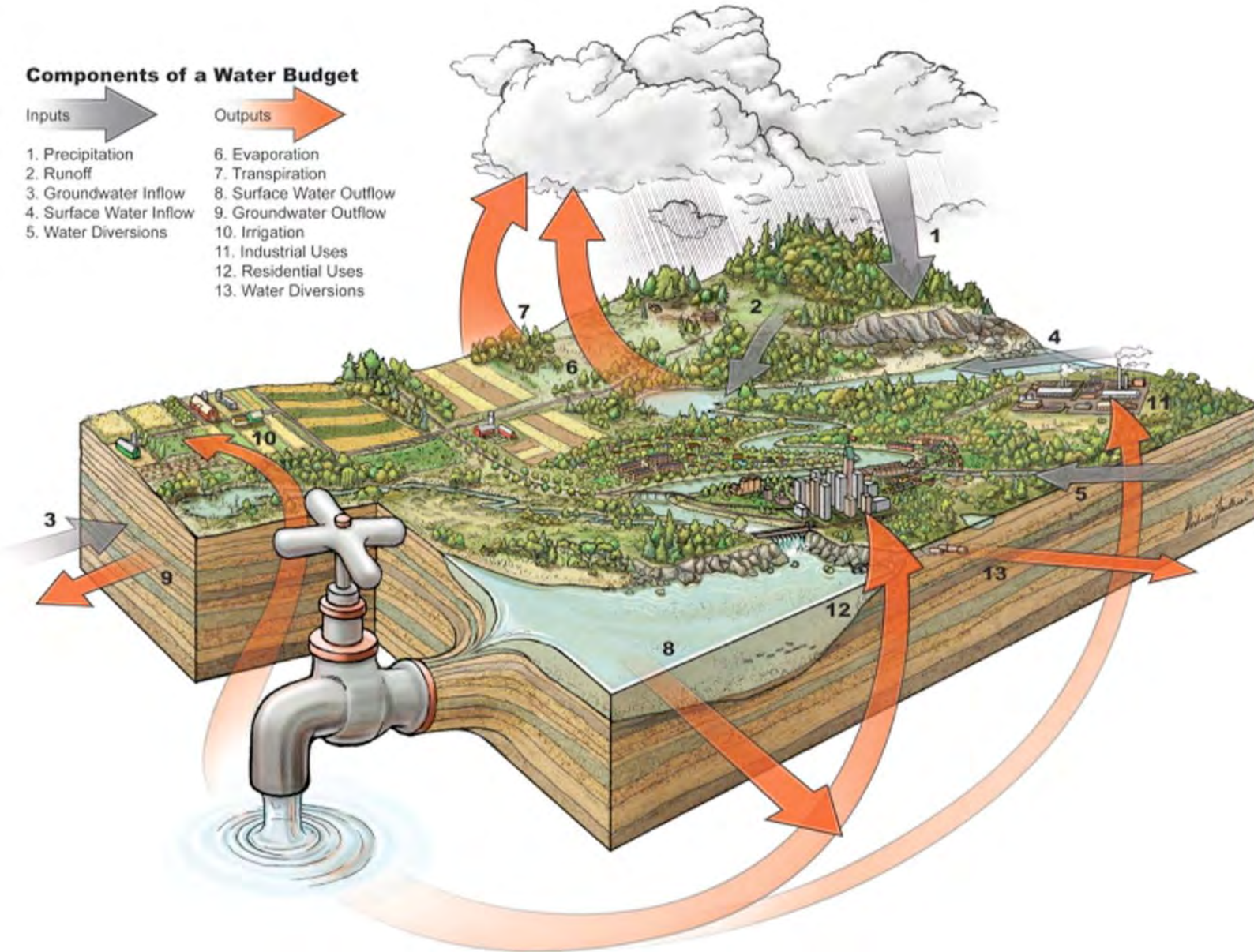
- Quantify benefits of nature-based solutions
- Compare to status quo
- Cost/benefit analysis
- Decision-support tool

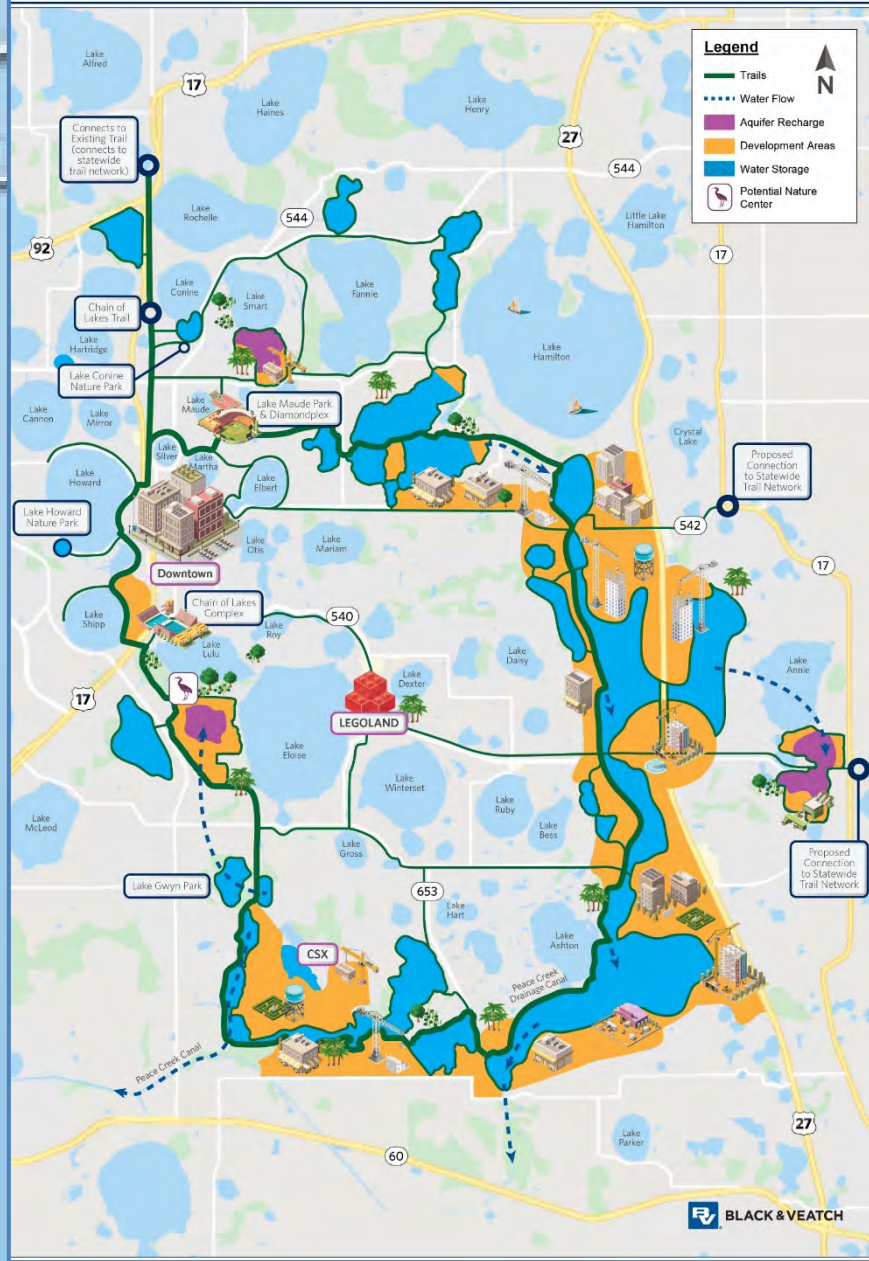


It all Starts with WATER

Water Budget = The relationship between the inflow and outflow of water through a specified region.

- How much do you have?
- How much does it cost?
- What is the quality of the Resource?
- What choices does Winter Haven have to meet current and future needs?
- How shall Winter Haven invest its economic resources for the next 50 yrs?
- What will be the Value Proposition?





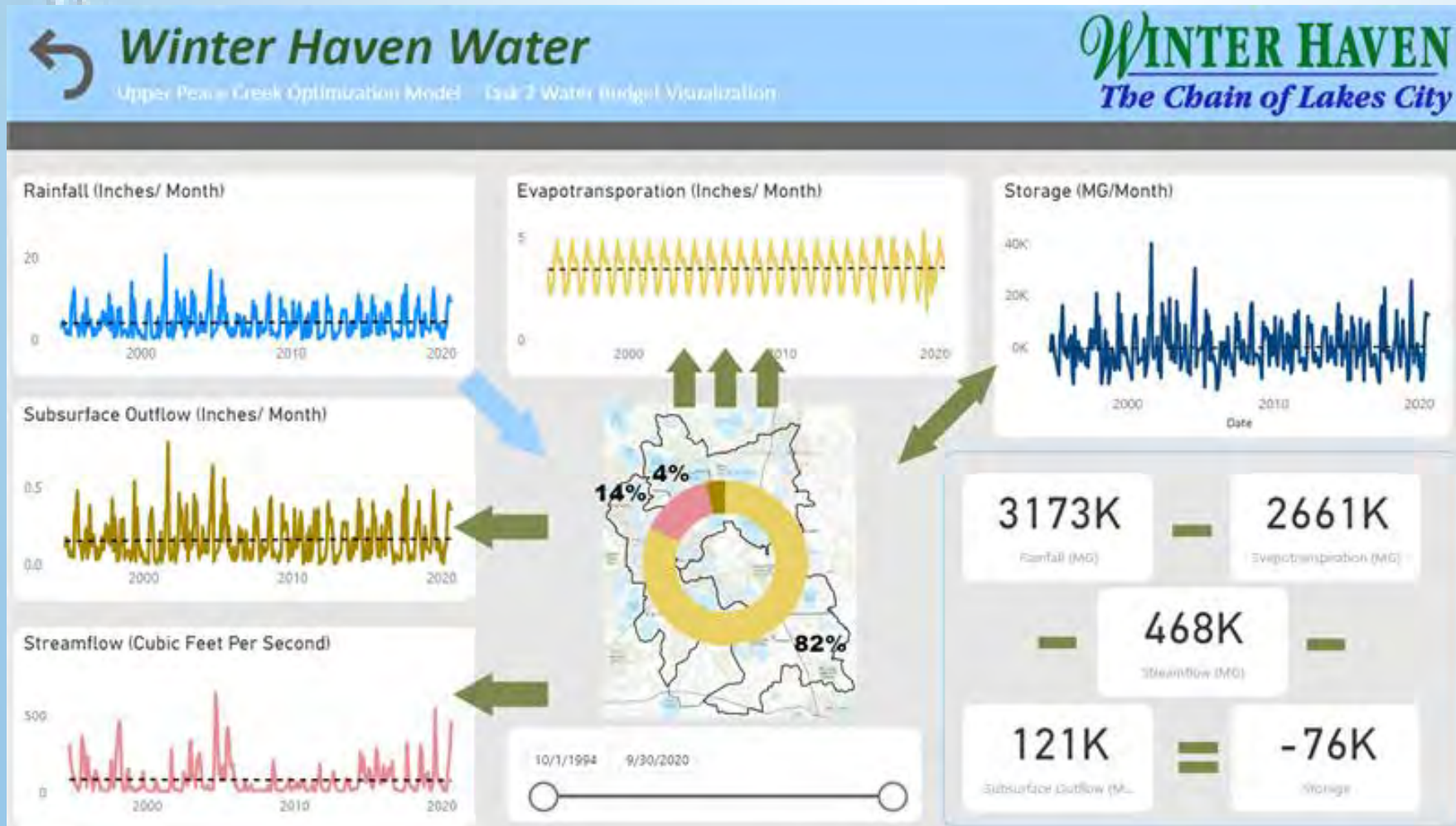
WINTER HAVEN

The Chain of Lakes City

Winter Haven's "Sapphire Necklace"
Restoring Water Resources, Adding Community Value

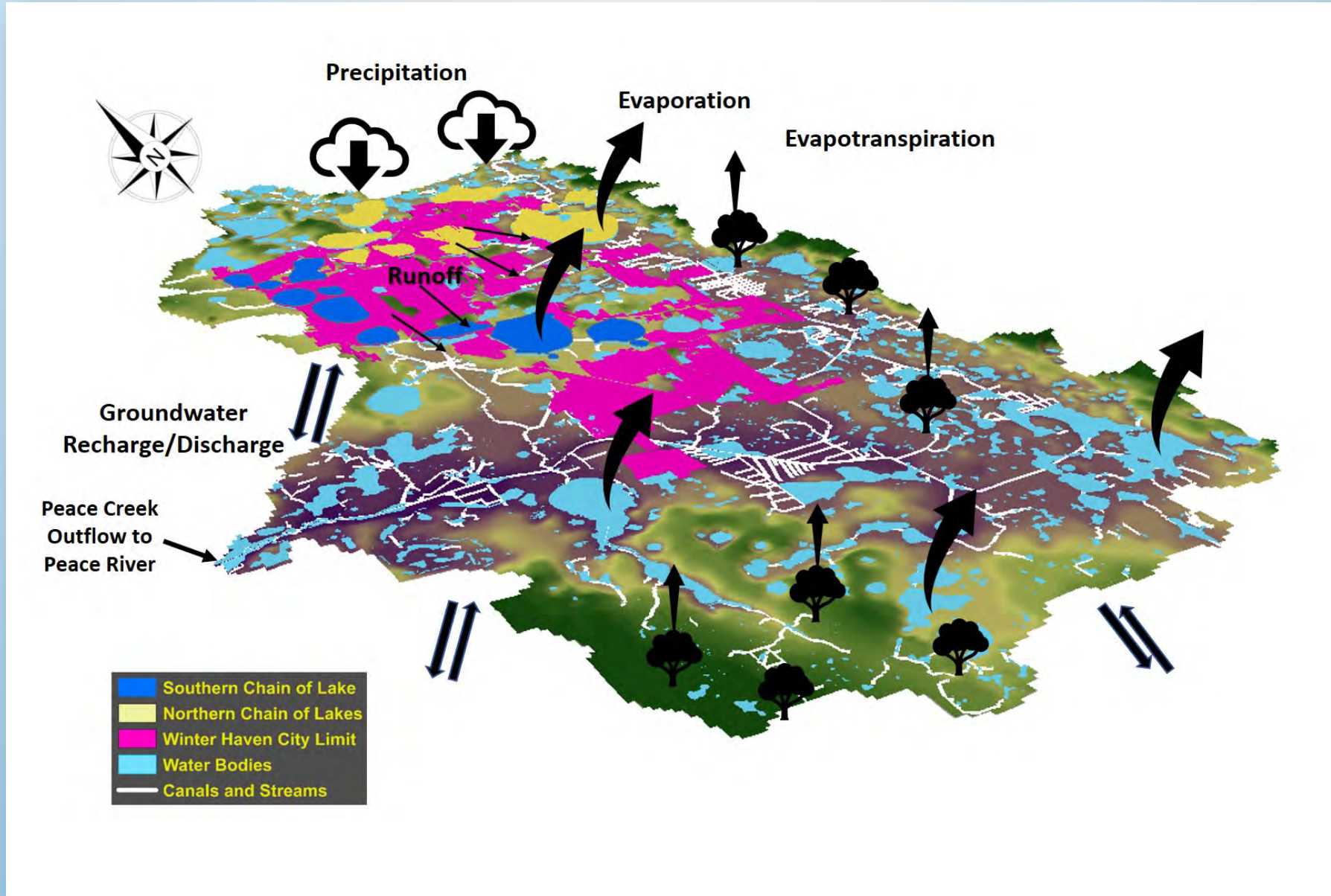


Upper Peace Creek Watershed Optimization Model

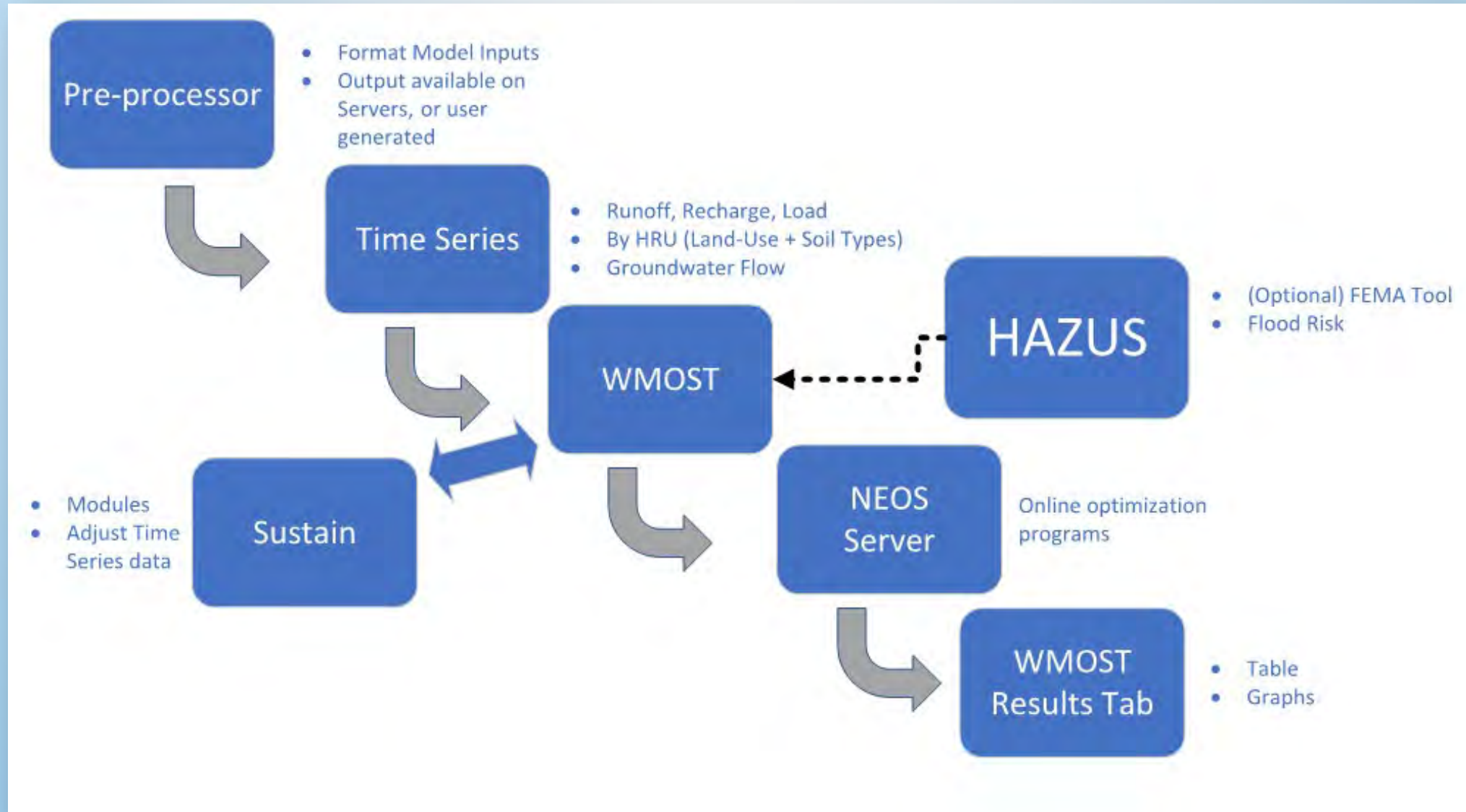


- Water Budget
- Integrated planning model
- Optimize on multiple objectives
- Support decision-making

Upper Peace Creek Watershed Optimization Model



Upper Peace Creek Watershed Optimization Model



One Water Land Development Policy Toolkit

Policy tools and best practices for achieving One Water in Winter Haven

Land Development Policy Toolkit

- Land-water connection
- Menu of strategies
- Benefits to developers and water resources

One Water Land Development Strategies:

Protect & restore natural systems

Optimize urban footprint

Expand & connect green infrastructure

Reuse water

Benefits/Expected Outcomes



Healthy Lakes & Wetlands



Resilient Water Utilities



Thriving Community



Strong & Growing Economy



Sustainable Agriculture



Partnerships

← WINTER HAVEN ONE WATER FRAMEWORK →

Conclusions

- **Water benefits all segments of our economy, culture, environment and quality of life;**
- **Money spent on water should create multiple benefits: supply; flooding; water quality; lake levels; habitat; recreation; tourism; economic growth.**
- **Natural Infrastructure approach necessary.**
- **Build out of communities and watersheds is a reality: different approach required in the face of limited resources.**

Thank You!



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Winter Haven Water

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