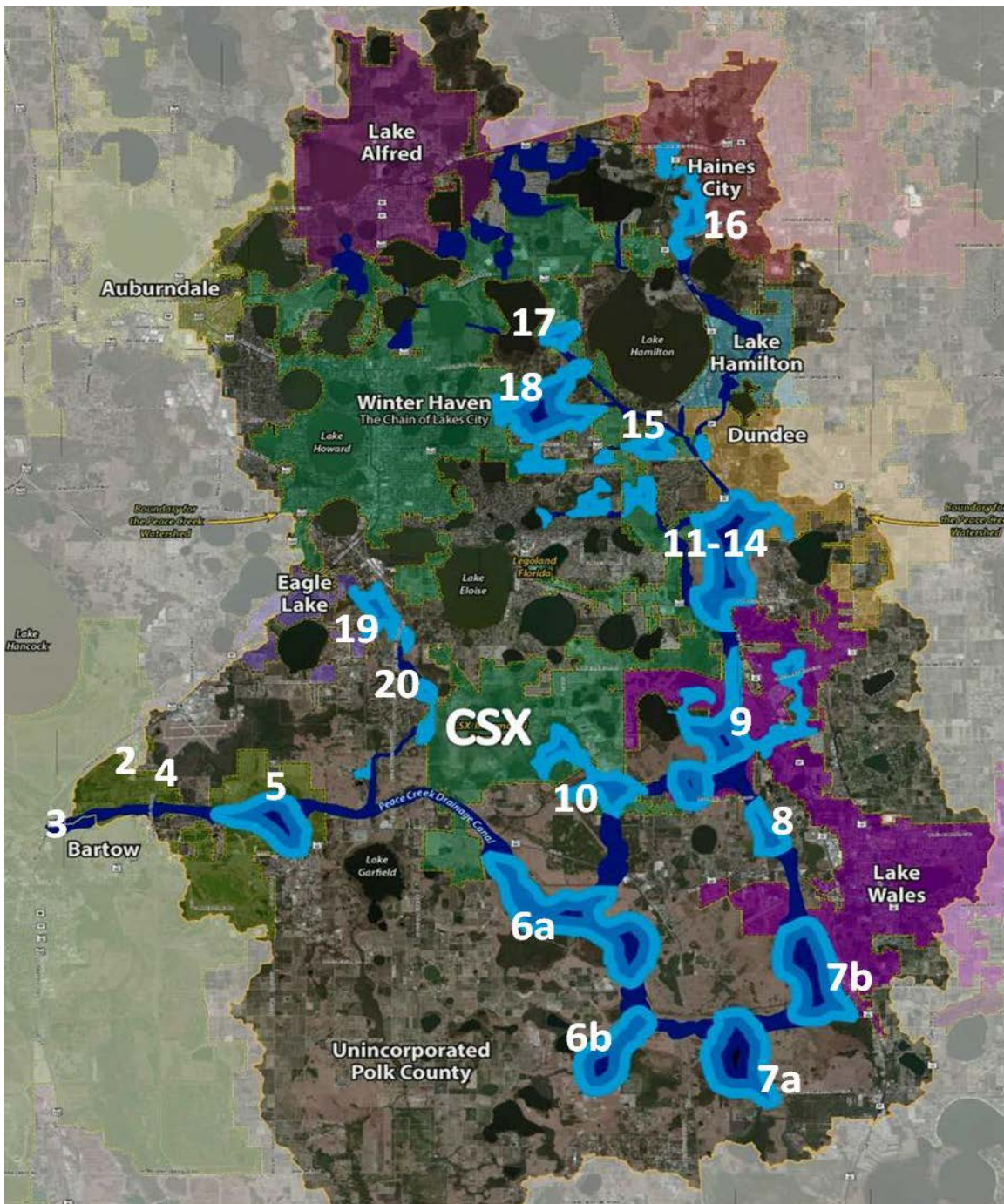


# Sapphire Necklace Hydrologic Restoration Project

Re-balancing the water budget &  
increasing the beneficial use of water  
in the Peace Creek Watershed





# Sapphire Necklace

- Regional water infrastructure improvement & ecosystem restoration project
  - System of groundwater, lake, & floodplain wetland storage
  - Interconnected by improved stream channels & water control structures
- Designed to
  - Restore surface & groundwater storage & native wetland functions prior to drainage
  - Allow for efficient conveyance of flood flows under current & future build-out scenarios

# Sapphire Necklace

- Provides critical storage to offset historic storage losses resulting from local & regional impacts
- 19 floodplain wetland storage sites
  - Encompass 13,134 acres
  - Provide 29,204 acre-feet of surface water storage (9.5 billion gallons)
  - Capable of supplementing up to 40% of the flow deficit in the upper Peace River during the worst dry-weather condition on record (Spring 2000)

Sources: SWFWMD, Peace Creek Watershed Management Plan, Surface Water Resource Assessment, November 2006; and Alternatives Report, December 2006

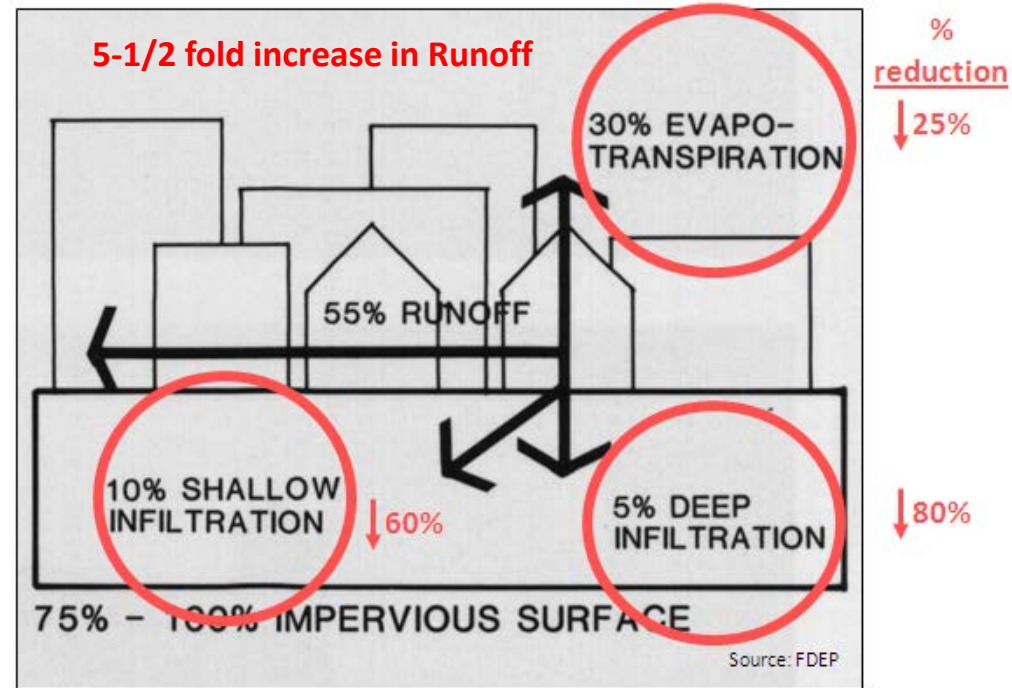
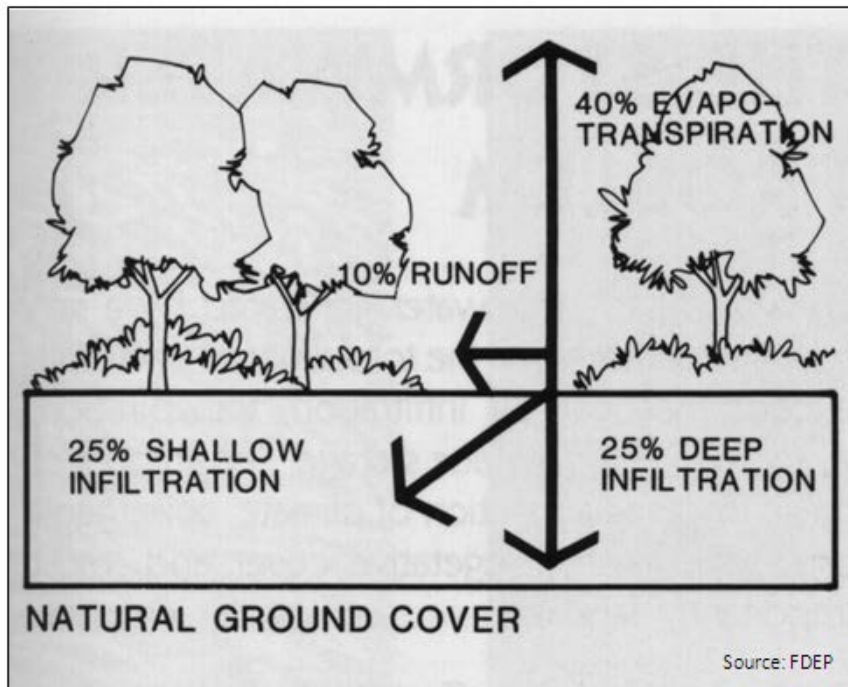
# Changes in the water budget for 16 lakes in the Southern Winter Haven Chain of Lakes

Water Budget Impacts	Amount (billion gallons)	Combined Totals (billion gallons)
Lake storage loss	1.8 <sup>1</sup>	28.8
Wetland storage loss	6	
Surficial aquifer loss	21	
Reduction in surficial aquifer recharge to Floridan aquifer	2	8.7
Reduction in lake recharge to Floridan aquifer	6.7	
<b>TOTAL storage losses &amp; reductions in Floridan aquifer recharge</b>		<b>37.5</b>
Decreased baseflow to Peace Creek Canal	50% reduction from 100 to 50 cfs	

<sup>1</sup>Estimated lake storage losses in the Northern Chain of Lakes are 47,940 ac-ft; 15.6 billion gallons

Source: Peace Creek Sustainable Water Resource Management Plan, Appendix C, City of Winter Haven, November 2010; copy available at [www.sustainablewinterhaven.net](http://www.sustainablewinterhaven.net)

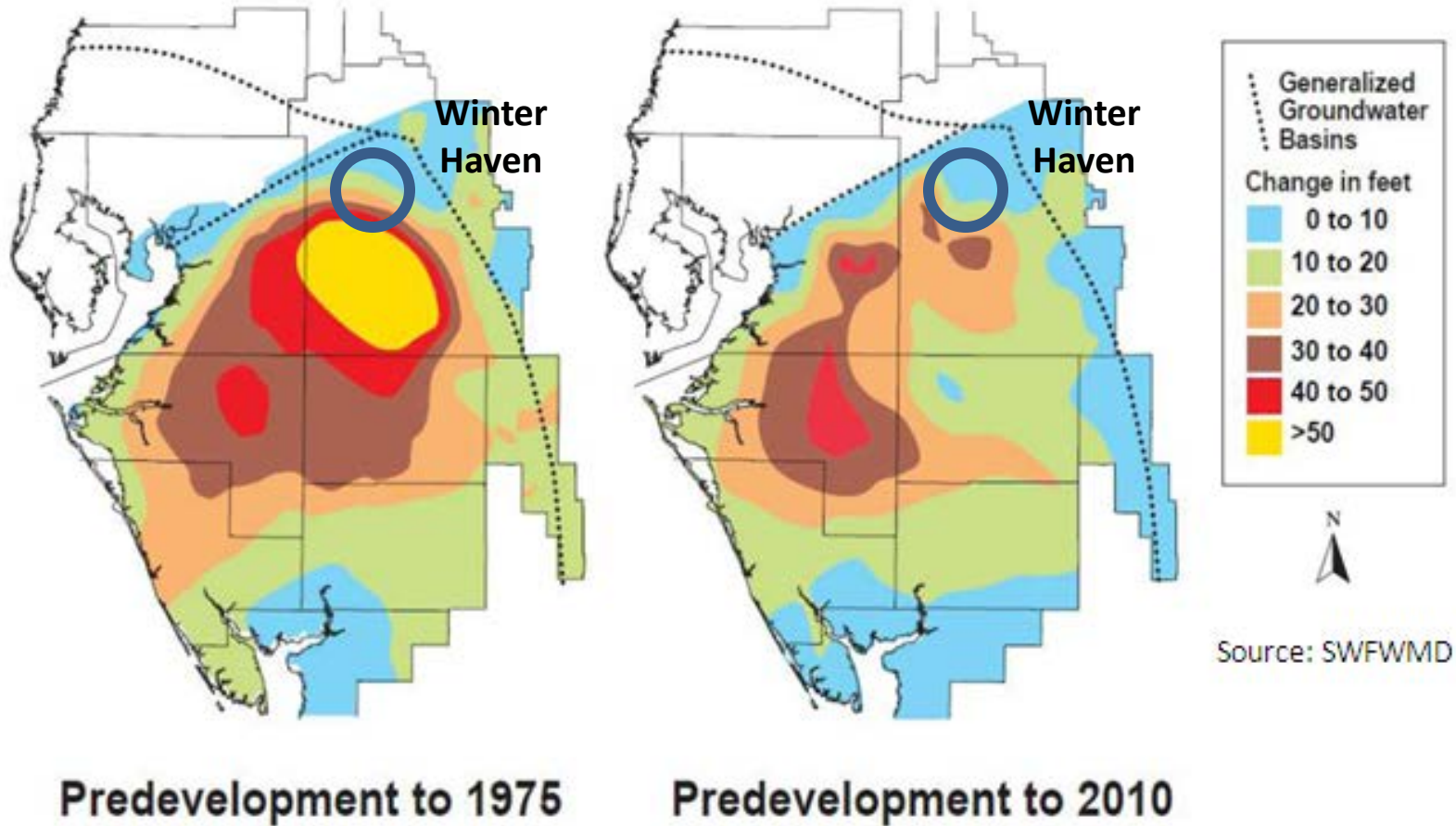
# Loss of hydrologic functions & beneficial uses of water associated with draining & paving over natural land surfaces



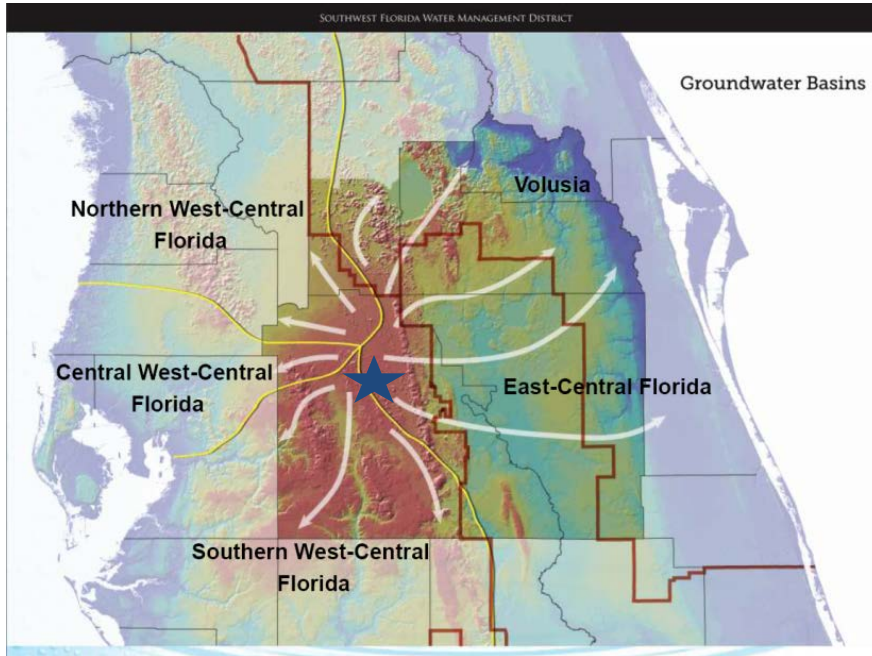
Sapphire Necklace will make use of excess surface water by:

- Increasing infiltration and treatment in the headwaters/Ridge area; and
- Increasing storage and conveyance in the middle and lower reaches/Polk Uplands area

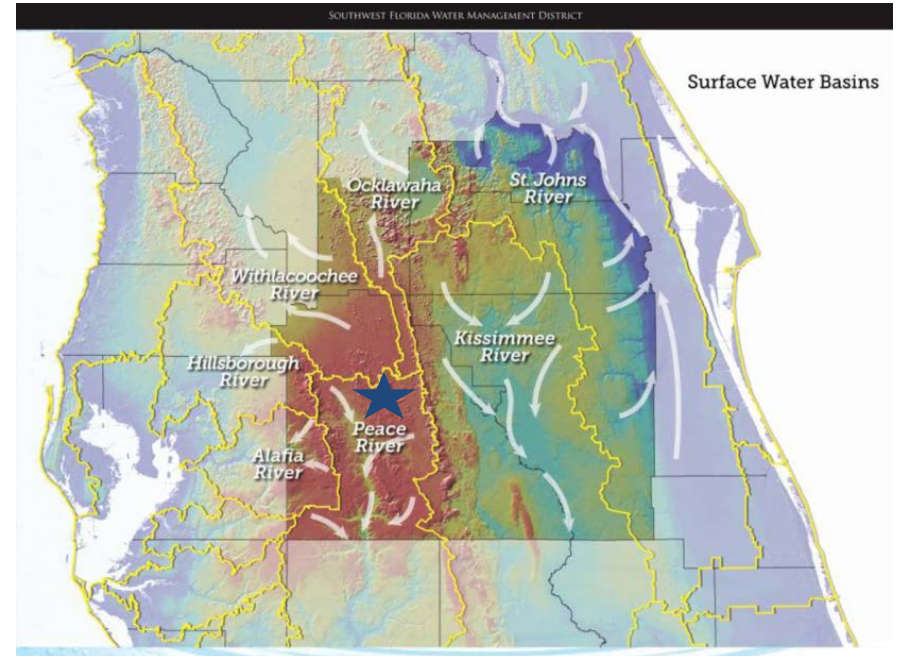
# Long-term Changes of the Potentiometric Surface of the Upper Floridan Aquifer



# Groundwater & Surface Water Flowing From Under & Away from **Winter Haven**★



Groundwater Flow



Surface Water Flow

Rainwater that falls in the watershed must be captured & stored for human & environmental use

# Avoiding Future Impacts

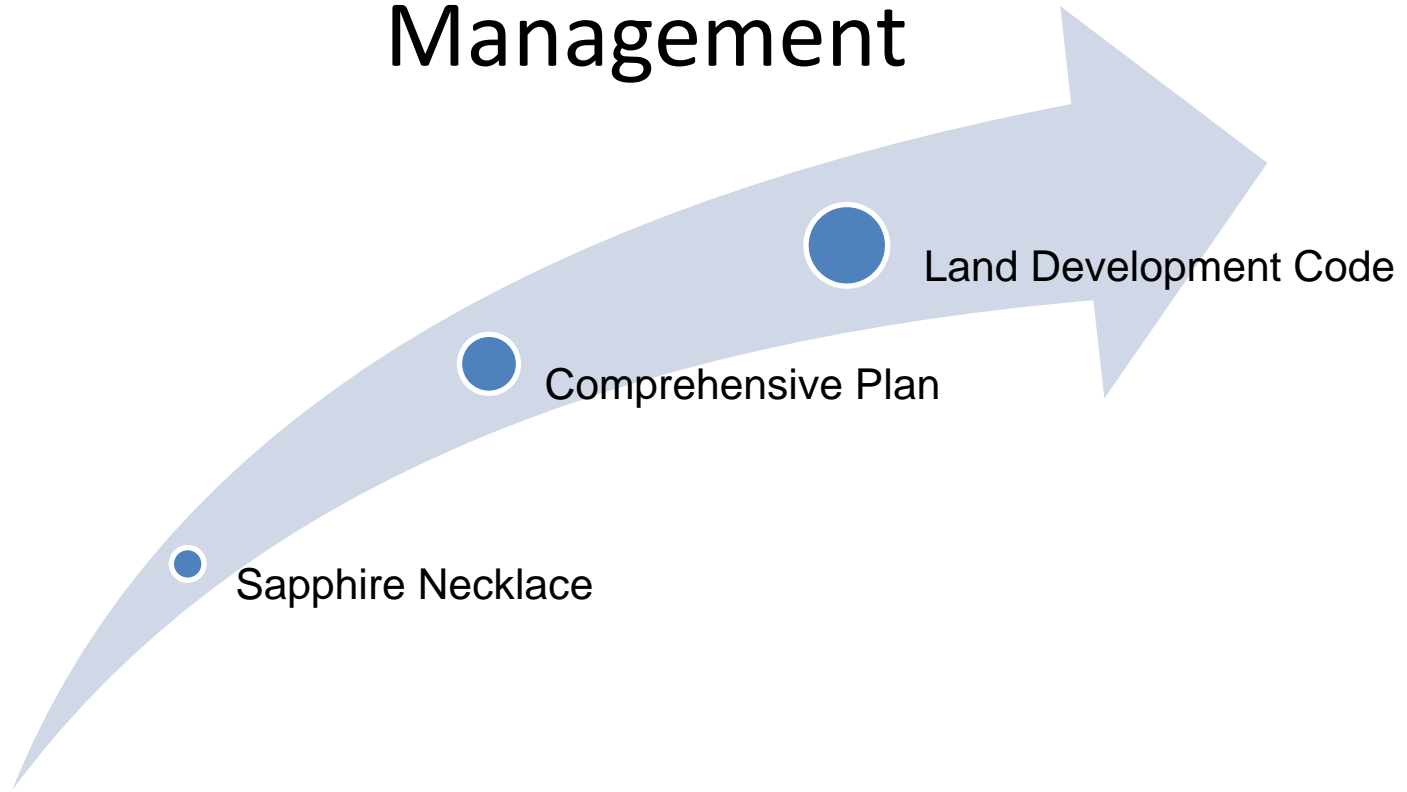
- Development associated with CSX Integrated Logistics Center
  - Create an estimated 8,500 jobs
  - Generate more than \$10 billion in economic development over 10 years
- Flood protection must be provided in a way that provides for the beneficial use of water
  - Wetland storage areas to store excess surface water for flood protection, mitigate environmental impacts, water quality treatment, & augment MFLs



# Multiple Purpose Project Benefiting Both Built & Natural Environments

- Lake level recovery
  - Lake levels 5-10 feet below predevelopment levels
- Increased flood storage
  - Three tropical storms in 2004 (25-year rainfall return period) caused widespread flooding & long periods of inundation
- Water quality improvement
  - 25/50 lakes in Winter Haven have impaired water quality
- Restoration of wetland functions
  - 9,000 acres of wetland losses
- Enhancement of fish and wildlife habitat
- Augmentation of minimum flows and levels
- Groundwater enhancement

# Integrates Land & Water Planning & Management



Directing development around the infrastructure for managing water

Properly planned and managed, the business and economic growth opportunities in the watershed could help restore and protect the water resources necessary to sustain a healthy and vital local economy, culture, and environment

# Integrates Economic, Social, & Environmental Benefits

Stakeholders	Benefits of Supporting Restoration
Municipalities	<ul style="list-style-type: none"><li>• Local &amp; regional economic development</li><li>• Local &amp; regional hydrologic &amp; environmental restoration</li><li>• Linking land &amp; water planning to enhance community quality of life</li></ul>
Landowners	<ul style="list-style-type: none"><li>• Increased land value associated with up-zoning of land</li><li>• Opportunity to sell conservation easements for restoration site or partner with mitigation bankers</li></ul>
Developers	<ul style="list-style-type: none"><li>• Flood protection linked to regional conveyance system will maximize developable/buildable footprint &amp; expedite permitting;</li><li>• Community supported development</li></ul>
Mitigation Bankers	<ul style="list-style-type: none"><li>• Hydrologic restoration necessary to support wetland restoration &amp; development of wetland credits</li><li>• Reduced investment and financial risk from partnering with landowners or developers in mitigating for pre-determined development</li></ul>
State	<ul style="list-style-type: none"><li>• Maximizes investment in CSX/ILC, Polk Parkway extension, and job creation</li><li>• Minimize &amp; avoid future development impacts to water resources</li></ul>

# Sapphire Necklace

- Unlike other regional restoration projects which are largely planned, funded, and implemented by the State will be:
  - Planned & directed by the City of Winter Haven in cooperation with the State and other public & private stakeholders
  - Largely funded through public-private partnerships involving mitigation bankers, developers, landowners, & municipalities
  - Implemented as development occurs
- This approach to implementation will:
  - Reduce & leverage the public investment in restoration & avoid future impacts to water resources

# Walking the Walk

- Senate Bill 536 (2014)
  - Identify opportunities to expand the beneficial use of reclaimed water, stormwater, & excess surface water
  - Evaluate the feasibility, benefit, & cost of constructing regional storage features on public or private lands for reclaimed water, stormwater, & excess surface water

*The health of our waters is the principal  
measure of how we live on the land*

*—Luna Leopold*

