



SANFORD ATTACKS I/I A SUCCESS STORY

Smart Planning, Smart Funding, and Persistence Protect the St. Johns River

Presented by Migdalia Hernandez, Water Resources Engineer
City of Sanford and Brown and Caldwell

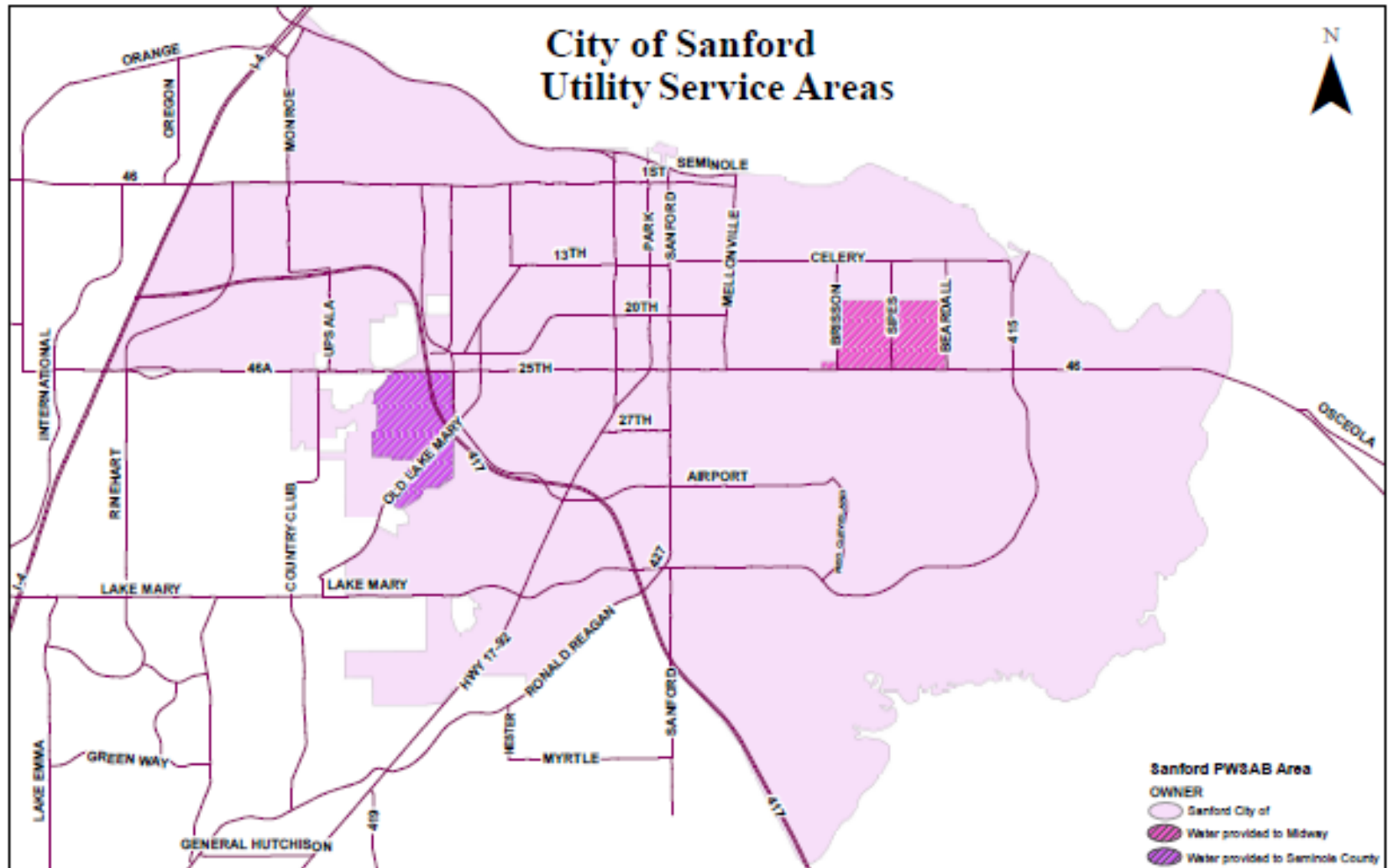
Today's Presentation

- Background
- City Wastewater Facilities
- Rainfall
- I/I and River Discharge Reductions
- Nutrient Discharge Reductions
- Improvements 2004 – 2012
- Funding
- Summary
- The Future
- Discussion

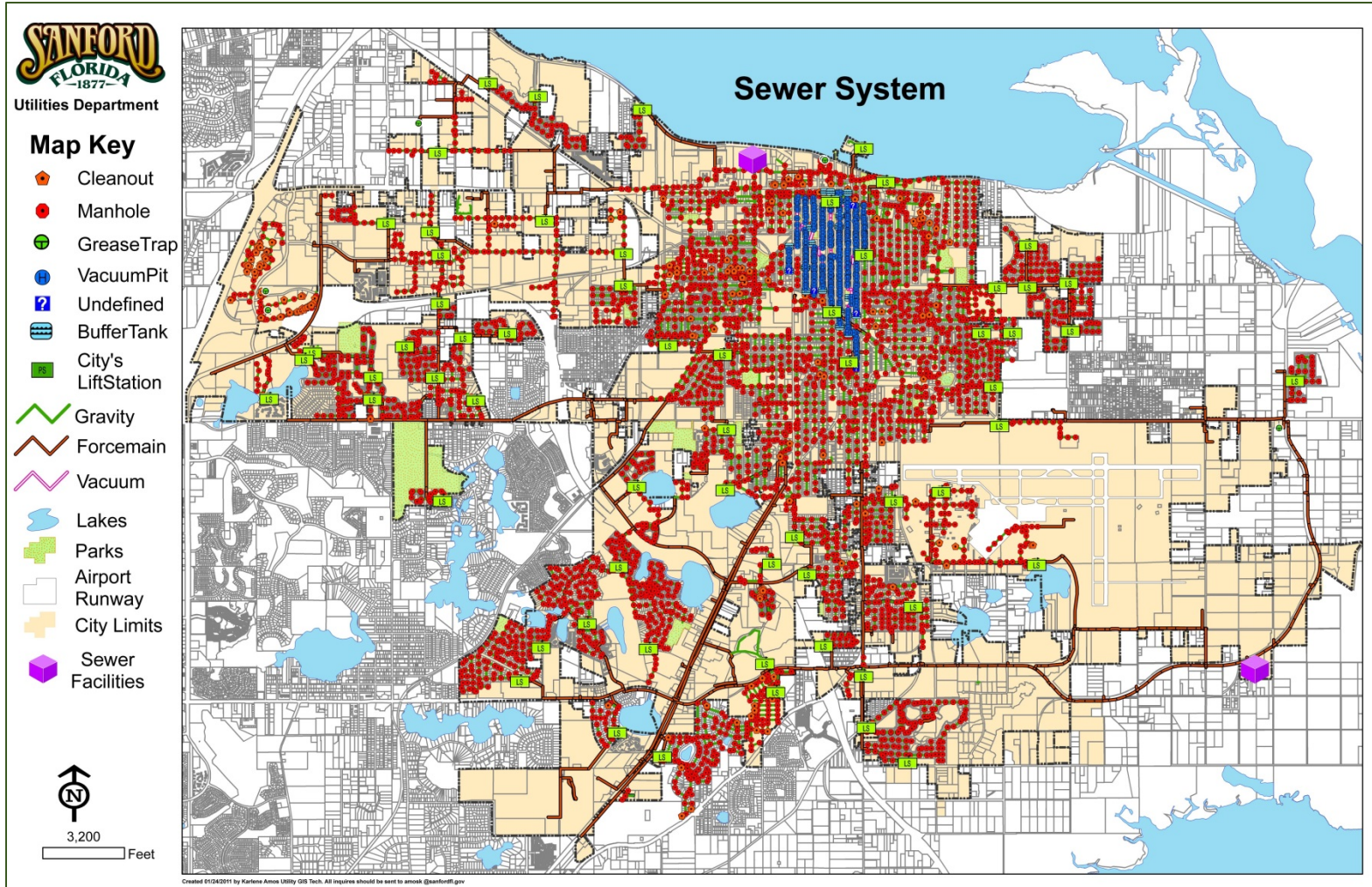
Background

- 2004 hurricanes pointed out need for I/I reduction
- City initiated Lake Monroe Watershed Protection Program
- Program includes
 - Engineering studies identified most I/I prone areas
 - Smoke testing, CCTV and manhole inspections to identify individual I/I sources
 - Renewal and Replacement (R&R) programs to eliminate I/I sources
 - Funding from City, State and Federal sources
 - Measuring results

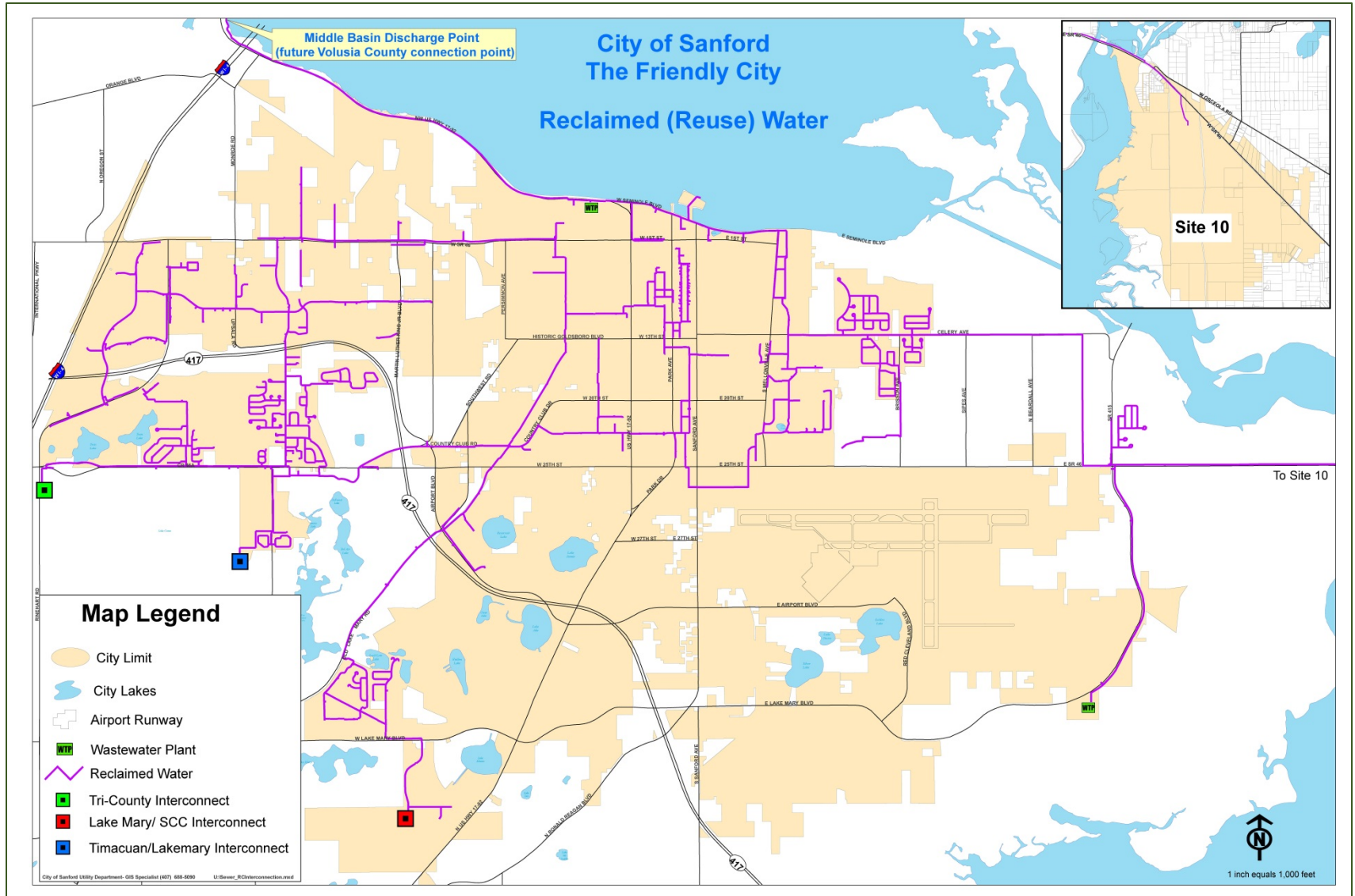
Sanford Water and Sewer Service Area



City Wastewater Facilities



Reclaimed – Reuse System



Rainfall

- Wet Season: June – September
 - 2004 (3 hurricanes): 37.1 inches
 - 2008 (Tropical Storm Fay): 34.3 inches
 - 2012 (Tropical Storm Debby): 32.1 inches
- Comparisons among these 3 wet seasons
 - I/I reduction
 - River discharge reduction
 - Nutrient discharge reduction



I/I Reductions

- Calculated I/I during wet season
 - 2004: 418 MG or 3.4 MGD average day
 - 2008: 350 MG or 2.8 MGD average day
 - 2012: 160 MG or 1.3 MGD average day
- I/I reductions since 2004:
 - 2008: 16.3%
 - 2012: **61.7%**

River Discharge Reductions

- Volume discharged to river
 - 2004 discharge:
667 MG
 - 2008 discharge:
352 MG
 - 2012 discharge:
104 MG
- Discharge volume reductions since 2004
 - 2008: 47%
 - 2012: **84%**

Nutrient Discharge Reductions

- Nutrient discharged to river during wet seasons
 - 2004 discharge: TN: 39,034 lbs TP: 4,948 lbs
 - 2008 discharge: TN: 25,467 lbs TP: 4,244 lbs
 - 2012 discharge: TN: 9,400 lbs TP: 1,512 lbs
 - 2012 (full year): TN: 11,637 lbs TP: 1,949 lbs
- Nutrient reductions since 2004
 - 2008: TN: 35% TP: 14%
 - 2012: TN: **76%** TP: **69%**

FDEP Permit - Nutrient Allocation Loads

- TMDL Nutrient allocation load limits:
 - TN: 19,342 lbs
 - TP: 2,345 lbs
- Met both N and P loading limits in 2012
 - TN: 11,637 lbs vs 19,342 lbs Permit Limit
 - TP: 1,949 lbs vs 2,345 lbs Permit Limit



How to Select Improvement Projects

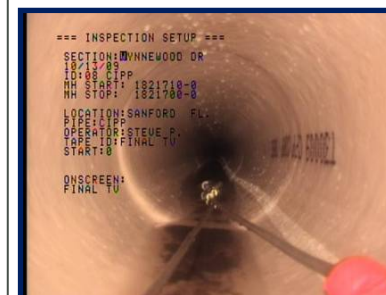
- Brown and Caldwell studies:
 - 2004: Effects of 3 hurricanes
 - Identified initial I/I reduction steps
 - 2009: Effects of Tropical Storm Fay
 - Identified pump station areas with high I/I
 - Quantified power and chemical costs of I/I
 - 2012: Effects of 2012 and look back to 2004
 - 2013: List of possible additional I/I reduction areas

Improvements Projects 2004 – 2013 (cont.)

- City/Contractor Sewer Inspection Projects
 - Smoke tested, CCTV and manhole inspections high I/I areas
 - 2005 Celery Avenue area
 - 2.6 miles pipe 55 manholes
 - 2006 10 pump station areas
 - 22.1 mi. pipe 485 MHs



BROWN and Caldwell



Improvements Projects 2004 – 2013 (cont.)

- City/Contractor Projects
 - Lined over 15 miles highest priority gravity sewers
 - 2007 Celery Avenue area
 - 2009 – 2011 8 subdivisions via ARRA funding
 - 2010 Collect Manhole data for model
 - 2012 Lined Highway 17-92 AC force main



Improvements Projects 2004 – 2013 (cont.)

City/Contractor Projects

- Located and corrected inflow sources
- Open clean out caps
- Roof drains
- Area drains
- Leaking manholes

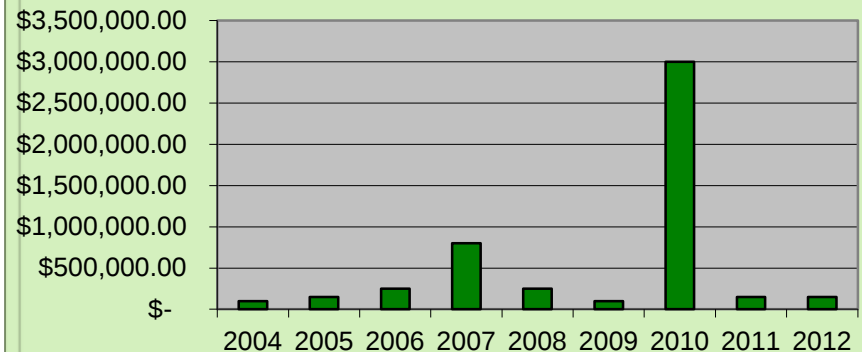


Funding

- 2004 - FEMA sewer shields grant
 - \$16,000
- 2005 - New City CIP for I/I Sewer Rehabilitation Budget Allocation (maintenance account not included)
 - \$150,000/year
- FDEP State matching grant = \$1.3 M (\$650,000 match)
 - \$250,000 2006-07
 - \$800,000 2007-08
 - \$250,000 2008-09
- ARRA – 2009 thru 2011
 - \$3.0 M
- City CIP I/I Sewer
 - 150,000 2011 to Present
- Prioritized 2013- 2014 CIP
- SRF – Wastewater Treatment Facilities



City of Sanford I/I Budget



Summary

• Reductions 2012 vs. 2004				
•	Infiltration and Inflow	Reduced	2.1 MGD	62%
•	Discharge to Lake Monroe	Reduced	563 Million Gallons	84%
•	Nitrogen Discharge to Lake Monroe	Reduced	29,622 lbs.	76%
•	Phosphorous Discharge to L. Monroe	Reduced	3,436 lbs.	69%
•	Dry Weather Plant Flow	Reduced	0.9 MGD	14%
•	Wet Weather Plant Flow	Reduced	3.0 MGD	32%
•	Power and Chemical Costs Saving due to I/I (2012 vs. 2008) :		\$65,778	61%
•	Collection System R&R Cost, 2005-12:		<\$5 million	
•	Value of 3 MGD Recaptured Capacity:		\$30 million*	

* Brown and Caldwell estimate - national average

The Future

- Best Management Practices
 - Continue to tighten collection system
 - Reduce I/I
 - Reduce effluent discharges to river
 - Reduce nutrient discharges
- Currently Developing a 5-year CIP – gravity pipe, manholes and AC force mains
- Evaluating pump stations to prioritize future I/I work
- Rehabilitate NWRP and SWRF - \$13 M
- Pending Funding – Wet Weather Storage and Treatment
 - SJRWMD
 - Reclaimed/Storm Treatment Pond at Site 10
 - Reclaimed Inter-Connect with Volusia County
 - FDEP/SJRWMD – Alternative Water Supply (reclaimed water/interconnects) and Water Quality (runoff nutrients reduction)

Discussion

