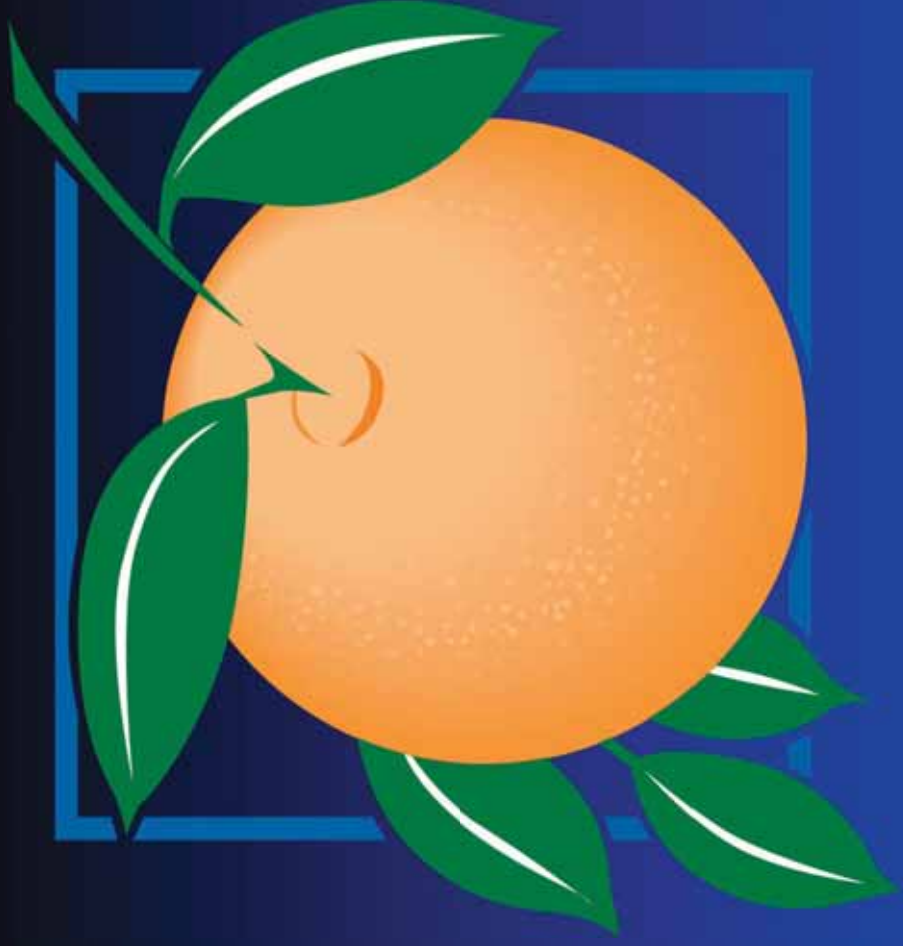




Westside Manor Drainage

Feb 1, 2018



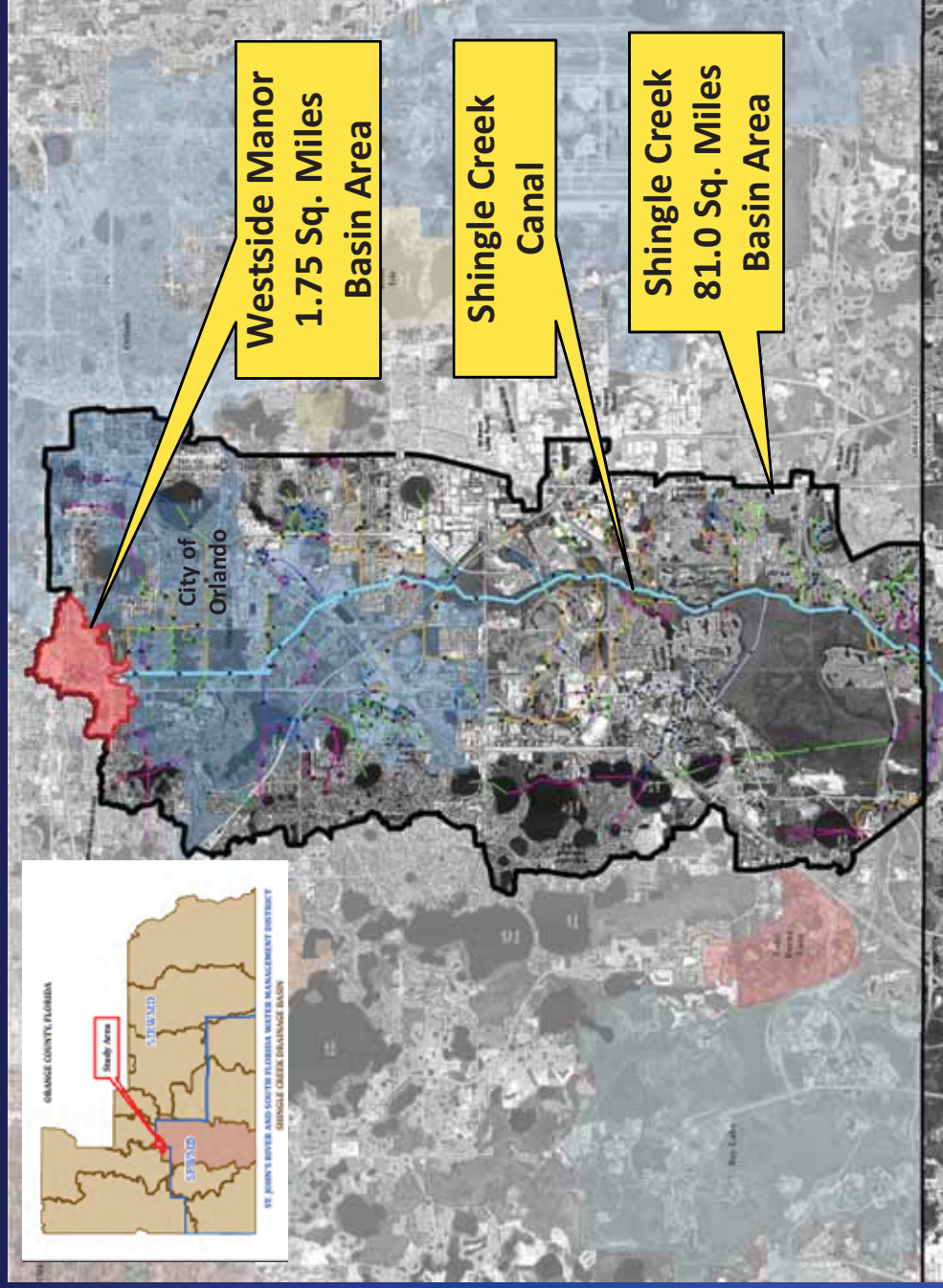
Presentation Overview

- History
- Hurricane Irma
- Pump Station Evaluation Study
- Next Steps



History

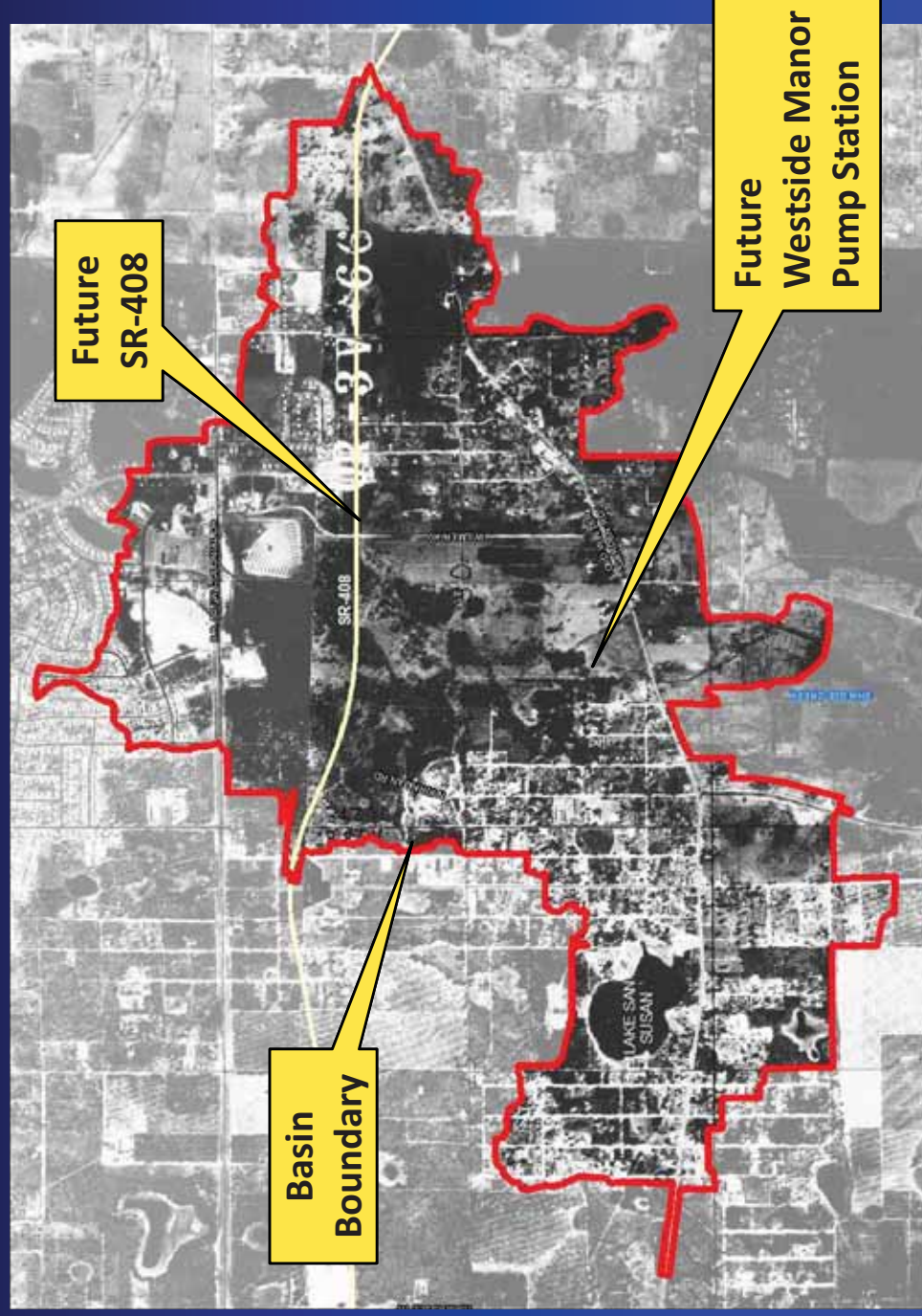
■ Watershed





History

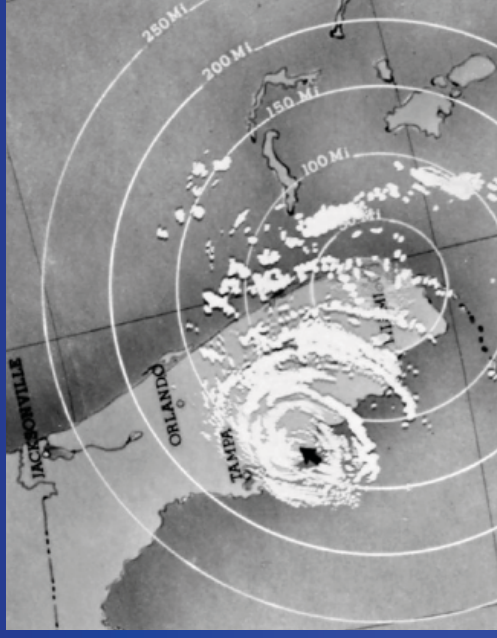
■ 1958 Aerial





History

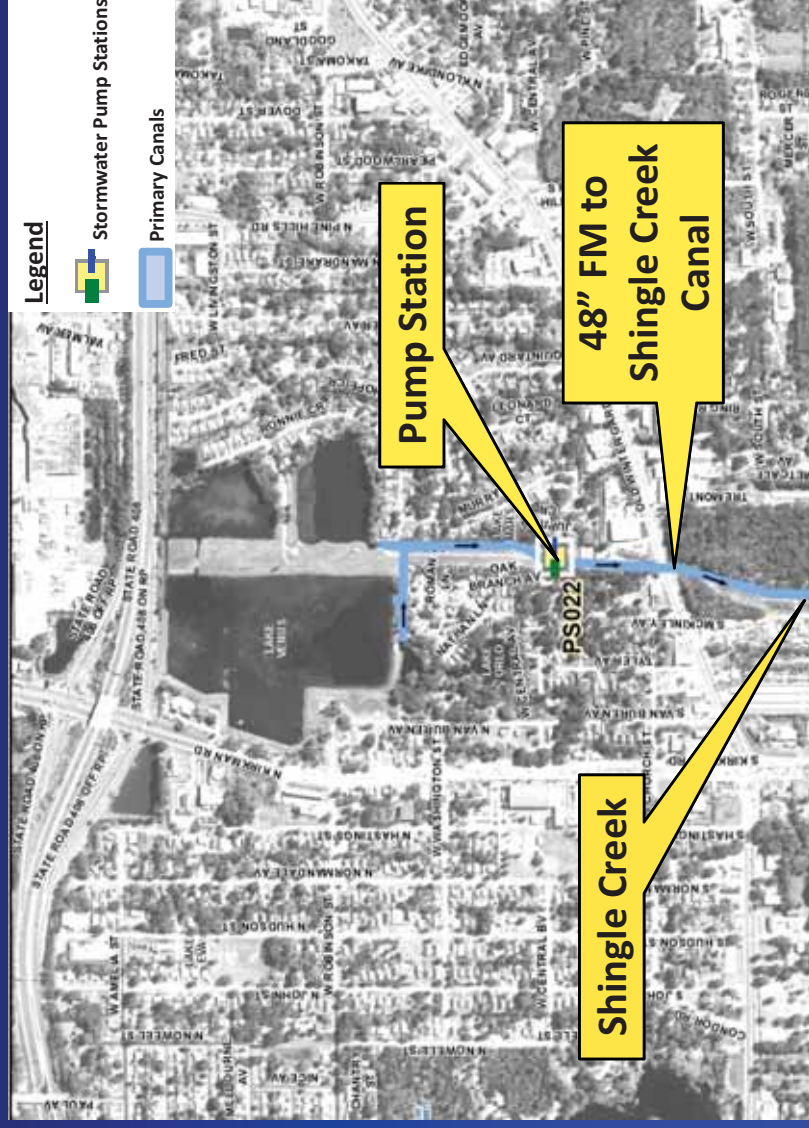
- Hurricane Donna 1960
 - During March of 1960, and again in September, the Westside Manor area was subjected to serious flooding which resulted in extreme property damage.





History

- In 1960, the Orange County Commission hired Michaels Engineering to conduct a drainage study of the Westside Manor area.





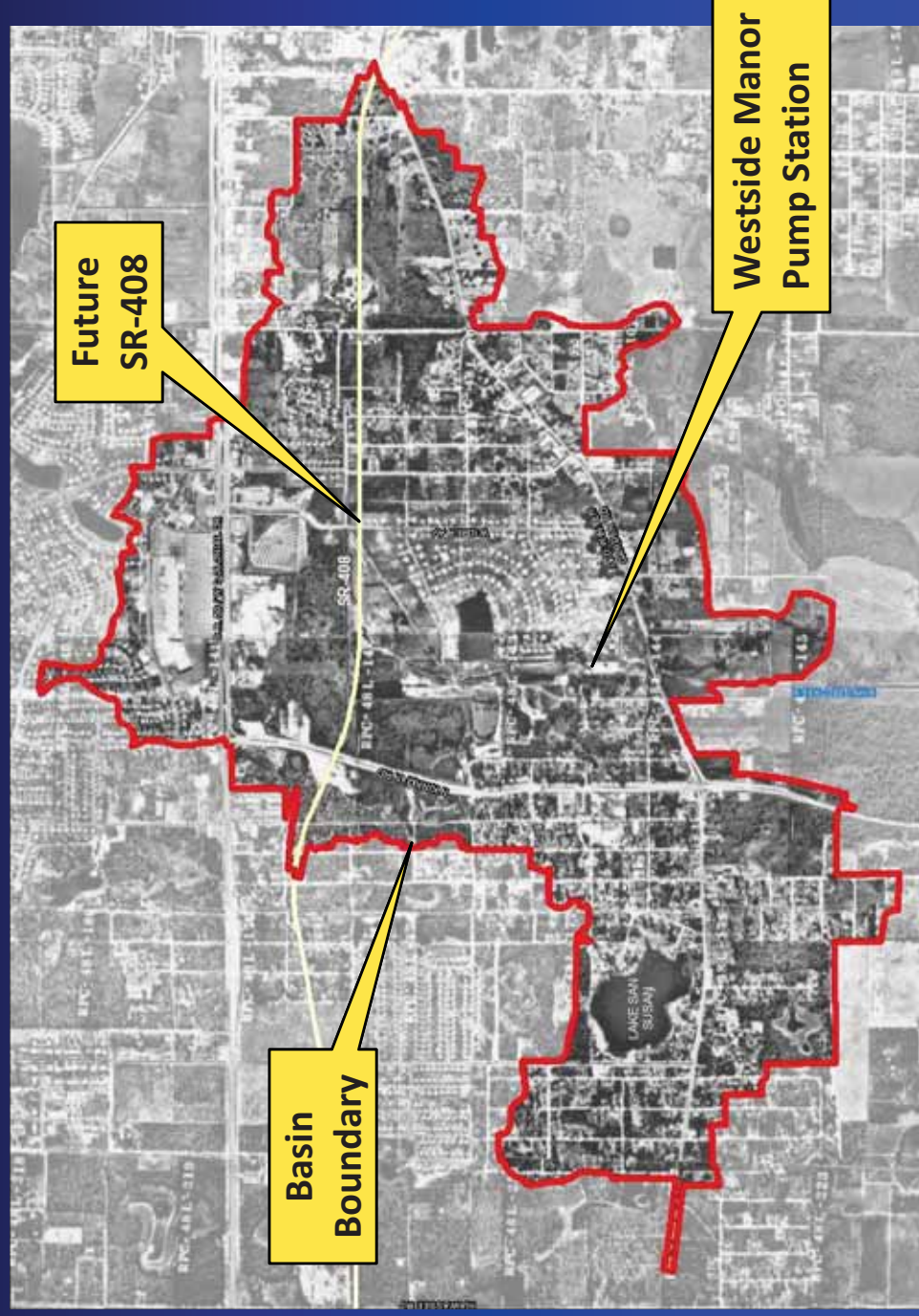
History

- The study predicted that these facilities would render the Westside Manor development safe from serious flood damage for storms up to a 25-year recurrence interval.
- Provided that
 1. Full 20 acre storage area was constructed
 2. The outfall canal & intake canals are continually cleaned & maintained.



History

■ 1963 Aerial





History

■ Since 1963

- Pond areas have been constructed (20 acres)
- Pumps, force main, and outfall canals have been maintained
- Upgrades in the last 15 years include:
 - (2) 20,000 gpm electric pumps replaced original diesel pumps
 - Back-up generator
 - Added telemetry monitoring
 - 48" force main leaks were repaired by slip lining the pipe



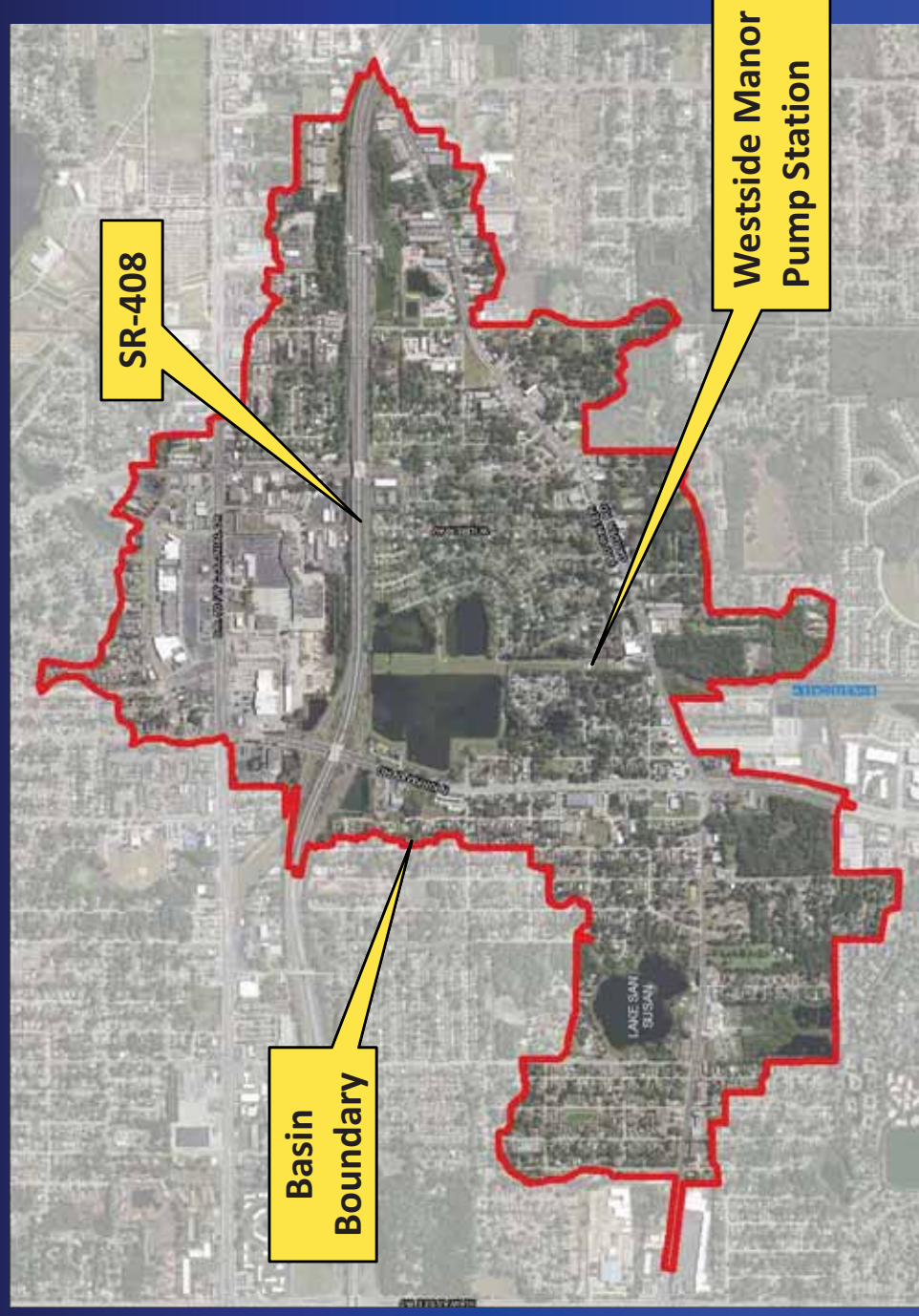
Presentation Overview

- History
- Hurricane Irma
- Pump Station Evaluation Study
- Next Steps



Hurricane Irma

■ 2017 Aerial





Hurricane Irma

- Hurricane Irma
- Excessive runoff from 9.1 inches of rainfall in 28 hours exceeded the capacity of the pumps.
- Observed flooding was very similar to the floodplain predicted from the ongoing drainage study.





Hurricane Irma

- Primary Factors for flooding:
 - Extreme Rainfall
 - Limited available storage
 - Increase in impervious area within the watershed



Hurricane Irma

- County Response
 - Pre-Storm
 - During Storm
 - Post Storm



Hurricane Irma

■ Pre-Storm

- Checked pump station, generator, fuel supply
- Pumped pond water level down to its lowest point to maximize storage
- Checked telemetry system
- Checked communications





Hurricane Irma

- During Storm
 - Monitored the pump station remotely with our telemetry system
 - Staff visited area to confirm that the pumps were operating
 - Staff reported widespread flooding and reported to the Emergency Operation Center





Hurricane Irma

■ Post Storm

- Pumped for (4) days @ ave. rate of 44 MGD = 176 MG
- Drawdown approx. 1"/hr
- By the 4th day, water levels were back to normal





Presentation Overview

- History
- Hurricane Irma
- Pump Station Evaluation Study
- Next Steps



Pump Station Evaluation Study

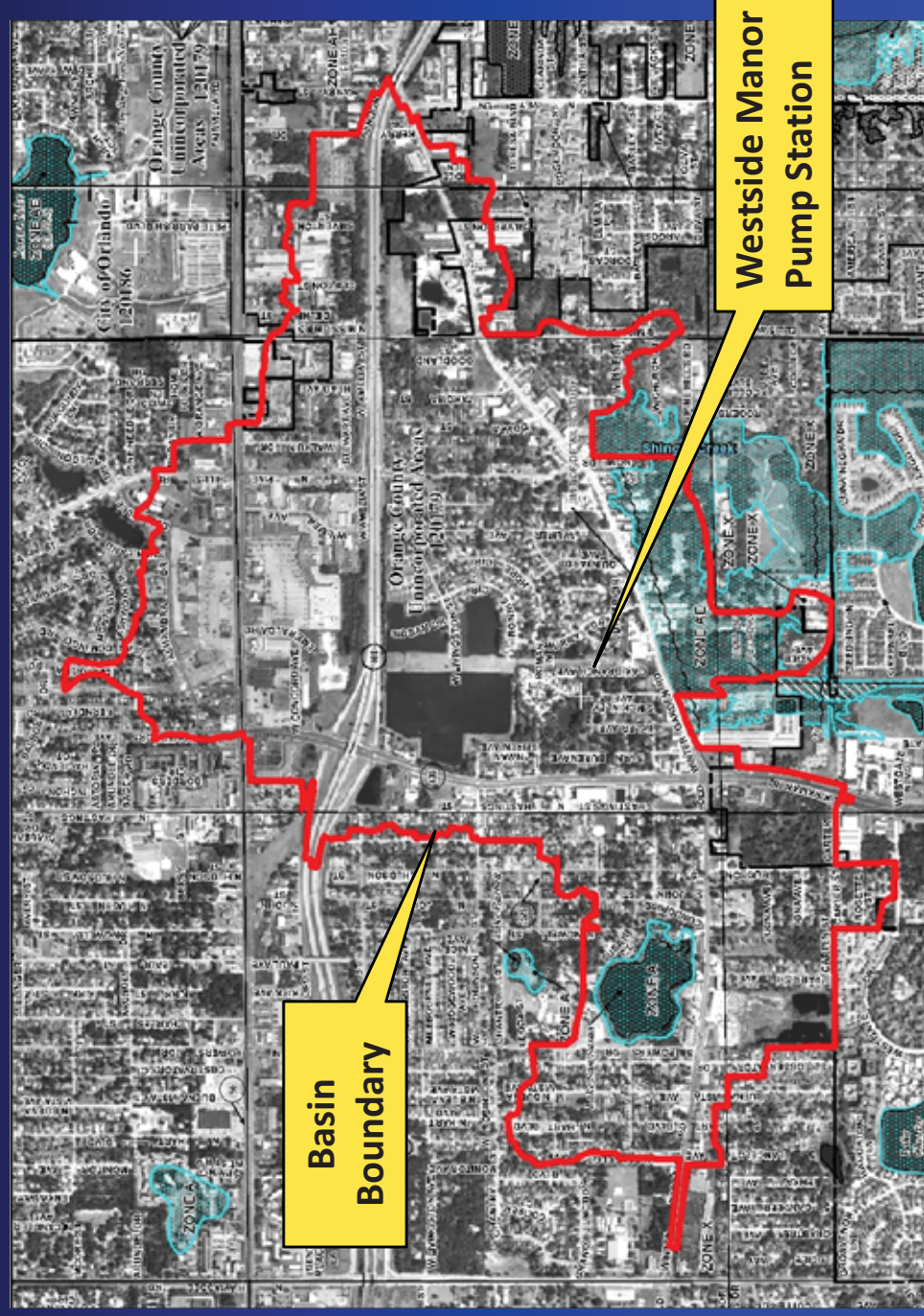
- In 2014, County initiated a detailed Watershed Management and Pump Station Evaluation Study
- Scope of Work
 - Assess the condition of pumps, controls, and force main
 - Determine the 10, 25, and 100 year storm elevations
 - Estimate the floodplain limits





Pump Station Evaluation Study

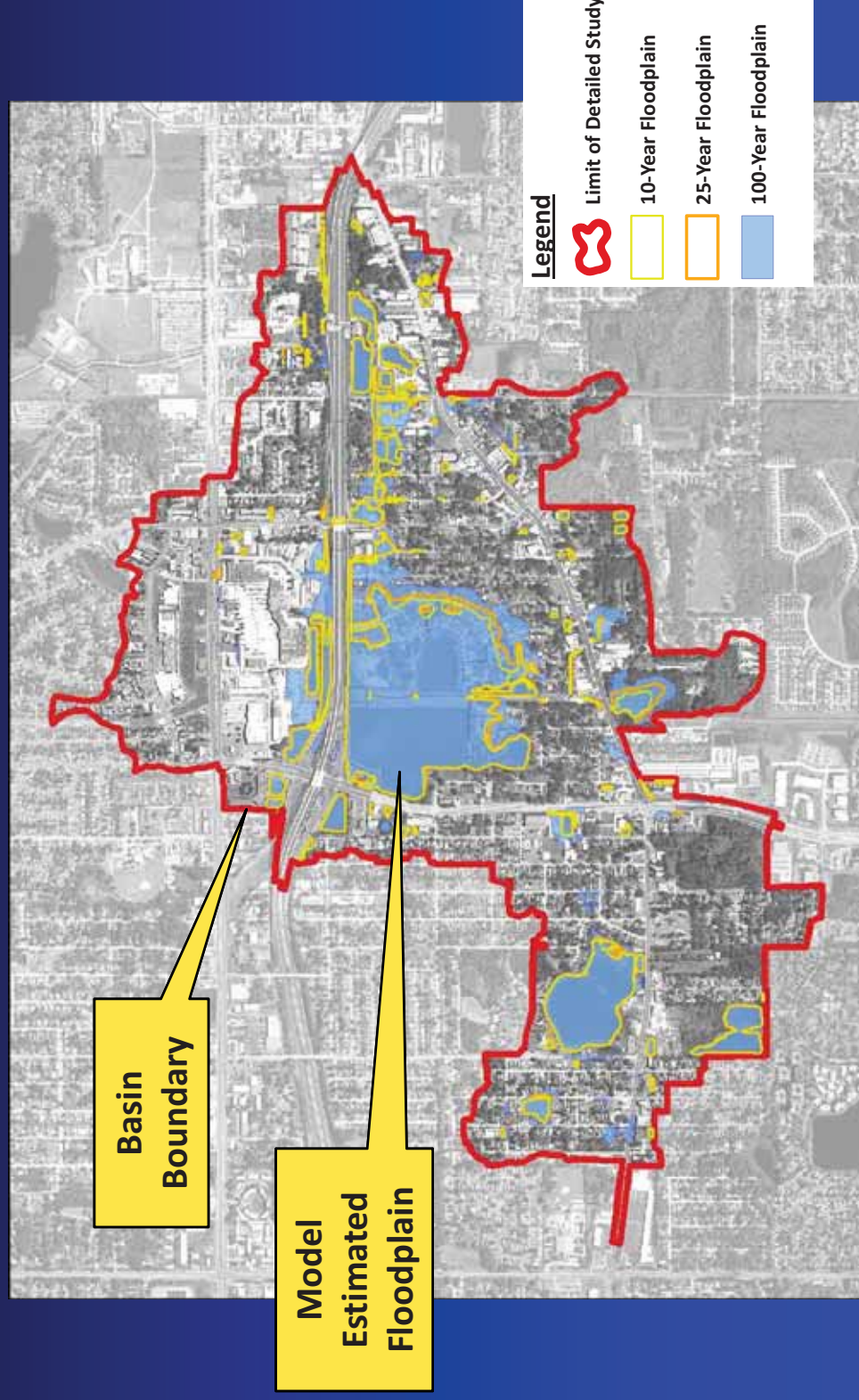
■ FEMA Flood Insurance Rate Map (FIRM)





Pump Station Evaluation Study

Existing Conditions





Pump Station Evaluation Study

■ Objectives

- Improve flood protection
- Minimize the number of parcels for flood mitigation
- Optimize Benefit/Cost

■ Alternatives

1. Optimize the pump float controls
2. Outfall force main upgrades
3. Selective pond expansion/creation



Pump Station Evaluation Study

■ Costs

Alt. #1 - Optimize pump float controls

Total Cost = Nominal

Alt. #2 - Outfall force main upgrades

Total Cost = \$908,000

Alt. #3 - Selective pond expansion/creation

Total Cost = \$6.2 M

Total Cost = \$7.1 M



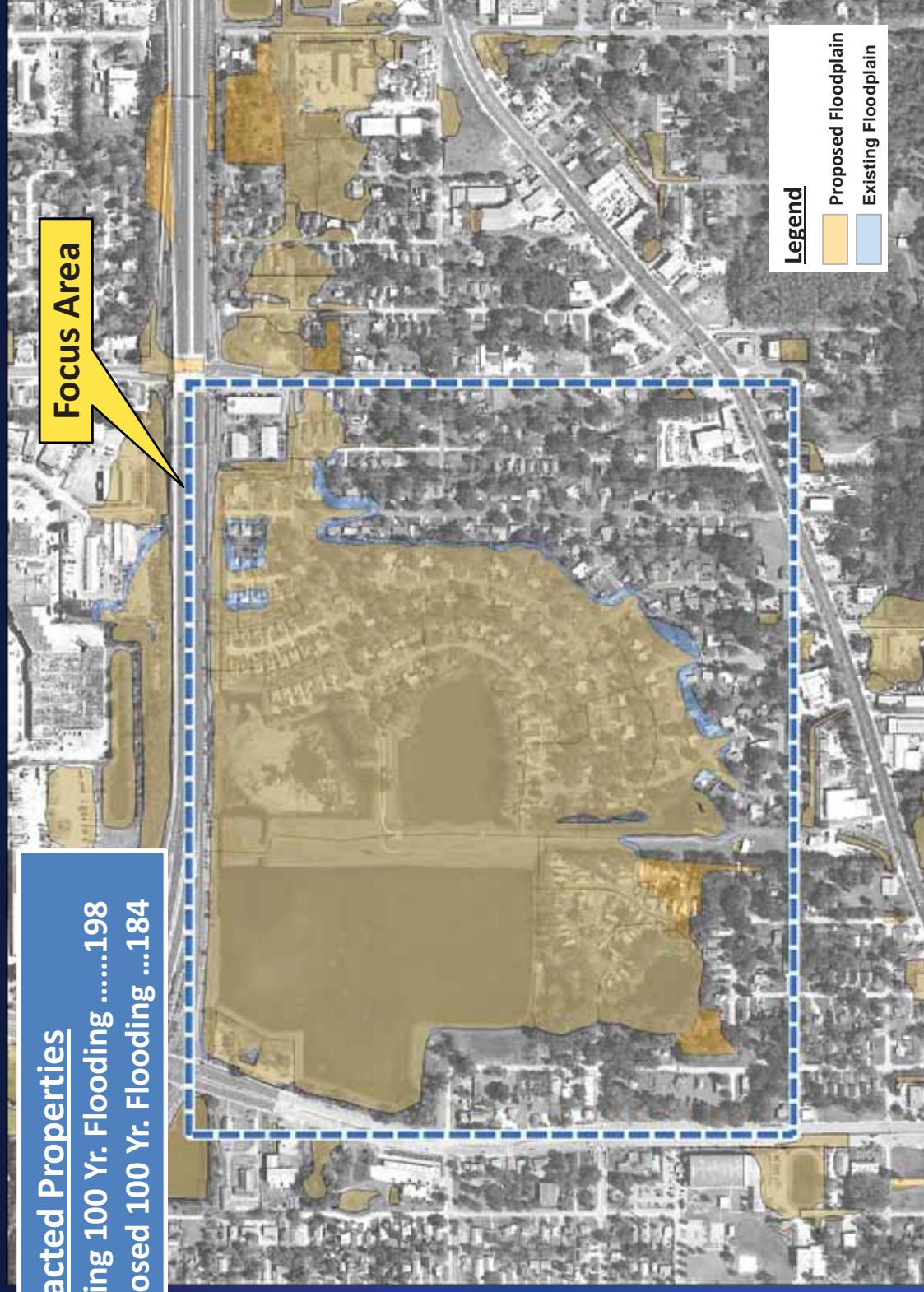
Pump Station Evaluation Study

Impacted Properties

Existing 100 Yr. Flooding198

Proposed 100 Yr. Flooding ...184

Focus Area





Presentation Overview

- History
- Hurricane Irma
- Pump Station Evaluation Study
- Next Steps



Next Steps Overview



- Finalize Initial Study
- Authorize Supplemental Report & Field Survey
- Explore the Hazard Mitigation Grant Program (HMGP) from FEMA



Next Steps

- **Supplemental Report & Field Survey**
 - Increasing pond storage
 - Upgrading the pumps to higher capacity
 - Confirm at risk properties
 - Report findings to the BCC



Next Steps

- Finalize Initial Study
- Authorize Supplemental Report & Field Survey
- Explore the Hazard Mitigation Grant Program (HMGP) from FEMA



Next Steps

- **Explore the Hazard Mitigation Grant Program (HMGP) from FEMA**
 - Determine grant feasibility for alternatives
 - Modify the HMGP application based on Supplemental Report alternatives (if needed)