

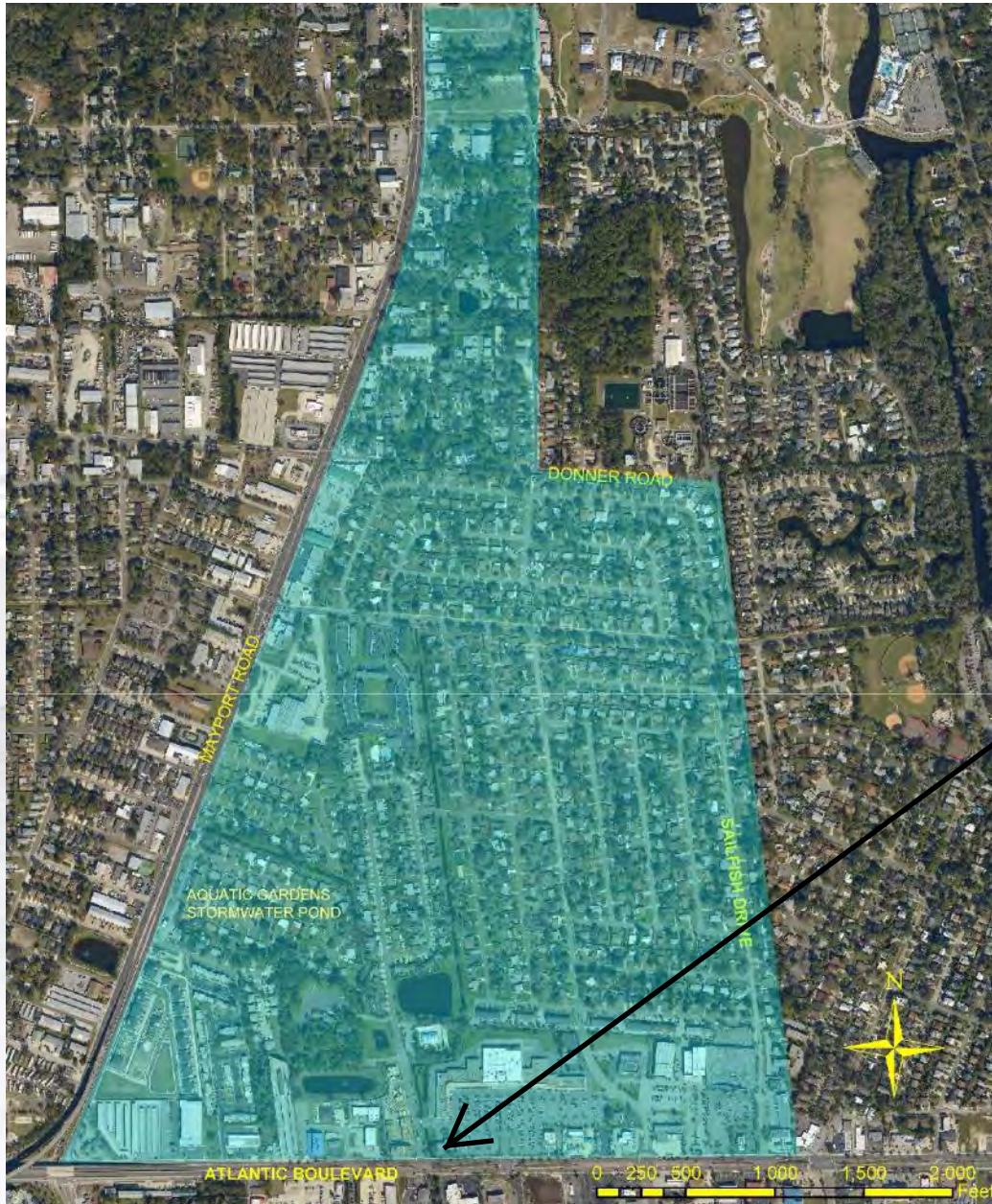
Aquatic Gardens Drainage Improvement Project



Project Goals

- **Primary Goal** – Provide Additional Protection to Homes
- **Secondary Goal** – Reduce Street & Property Flooding
 - Duration
 - Extent
- **Provide Flexibility for Future Expansion**
 - Sea Level Rise
 - Larger Rain Events
- **Be Cost Effective**

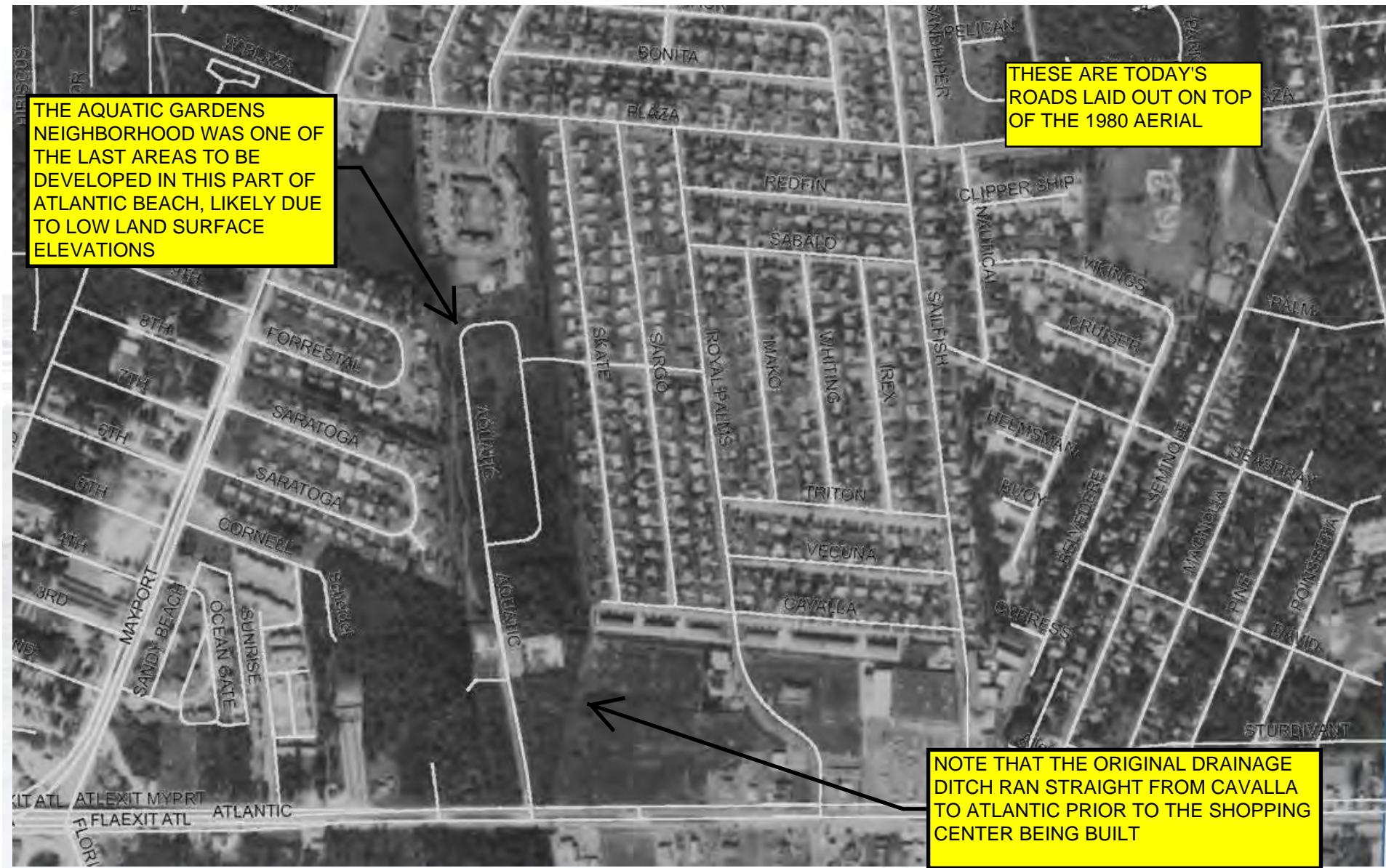
Hopkins Creek Drainage Basin



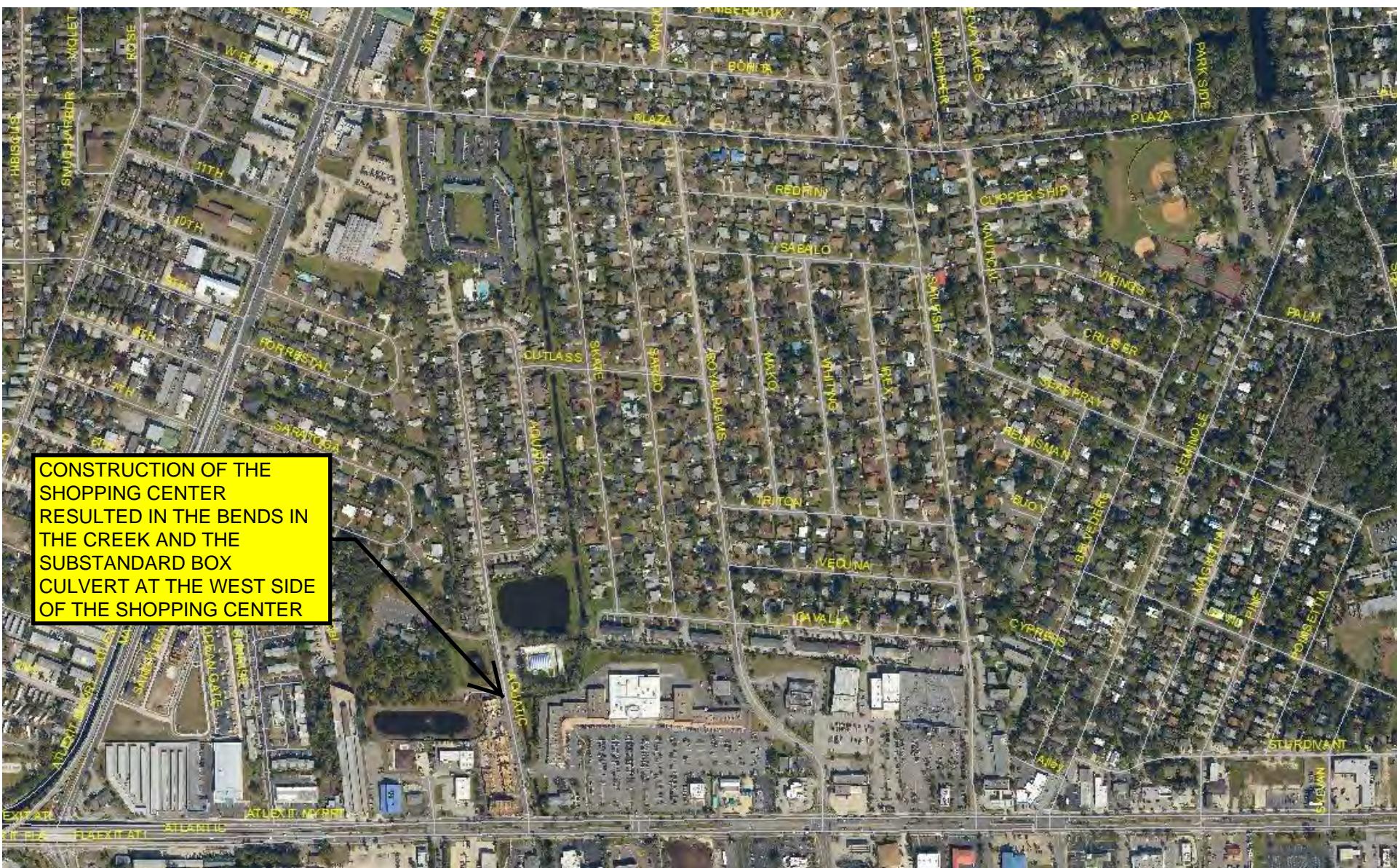
1943 Overlay



1980 Overlay



Present Day



Drainage Considerations

- Flat Terrain
- Tidal Influence
- Existing Development
- Reduced Conveyance and Storage
- Sea Level Rise
- Outfall through Neptune Beach

THIS MEANS IT IS A HARD AREA TO DRAIN AND SMALL INCREASES IN DOWNSTREAM WATER LEVELS IMPACT THE ABILITY OF THE WATER TO EFFICIENTLY DRAIN

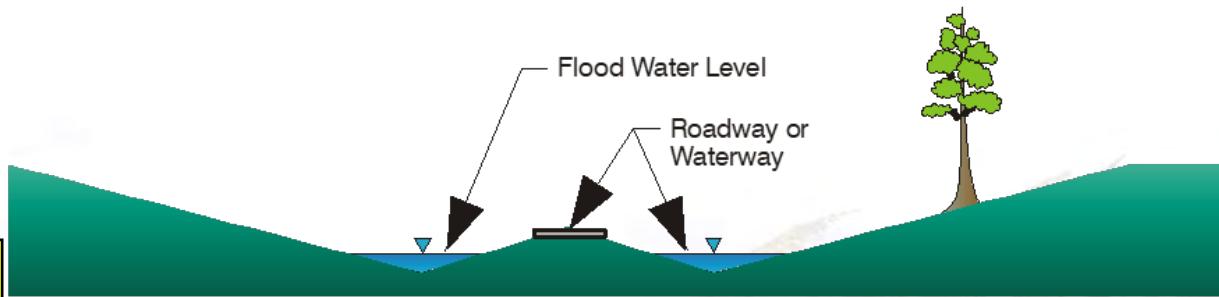
THIS IS NOW A FULLY DEVELOPED AREA AND THE WATER RUNS OFF MUCH FASTER THAN IT DID PRIOR TO DEVELOPMENT

THE CULVERTS AT FLORIDA BLVD AND FORREST AVE IN NEPTUNE BEACH ALSO RESTRICT THE DRAINAGE

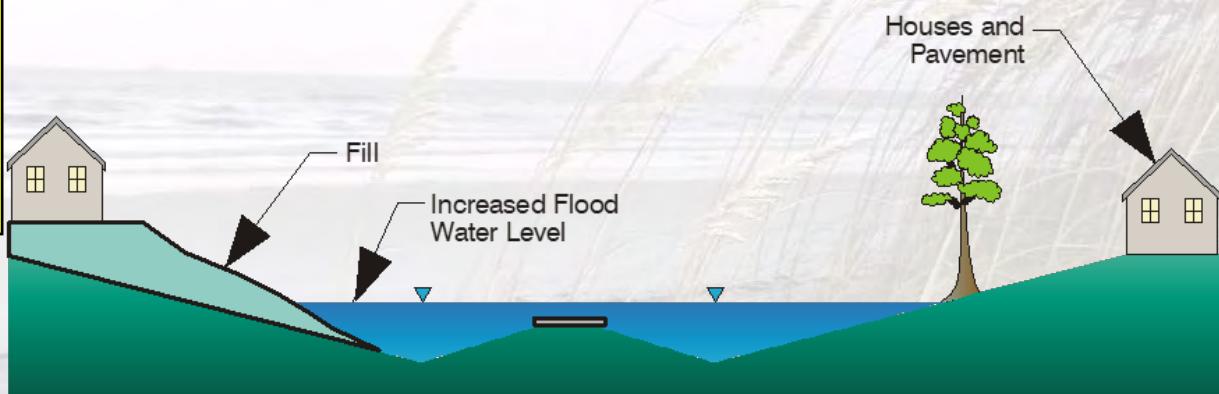
Impacts from Development

CASE 1: Base Conditions

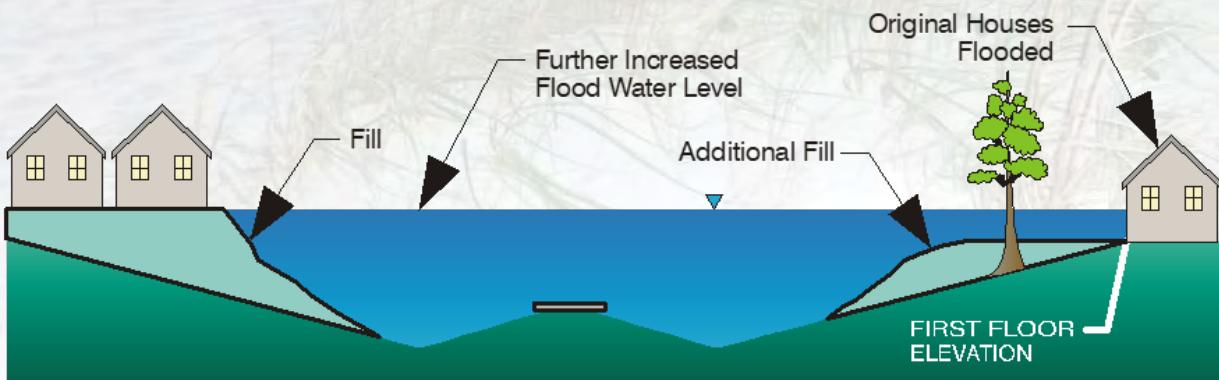
AS THE AREA WAS DEVELOPED, THE VOLUME OF RUNOFF INCREASED AND STORAGE IN THE SYSTEM DECREASED, RESULTING IN HIGHER WATER LEVELS IN THE DRAINAGE DITCH



CASE 2: Runoff Increased Due to Pavement and Lost Floodplain Storage Due to Fill



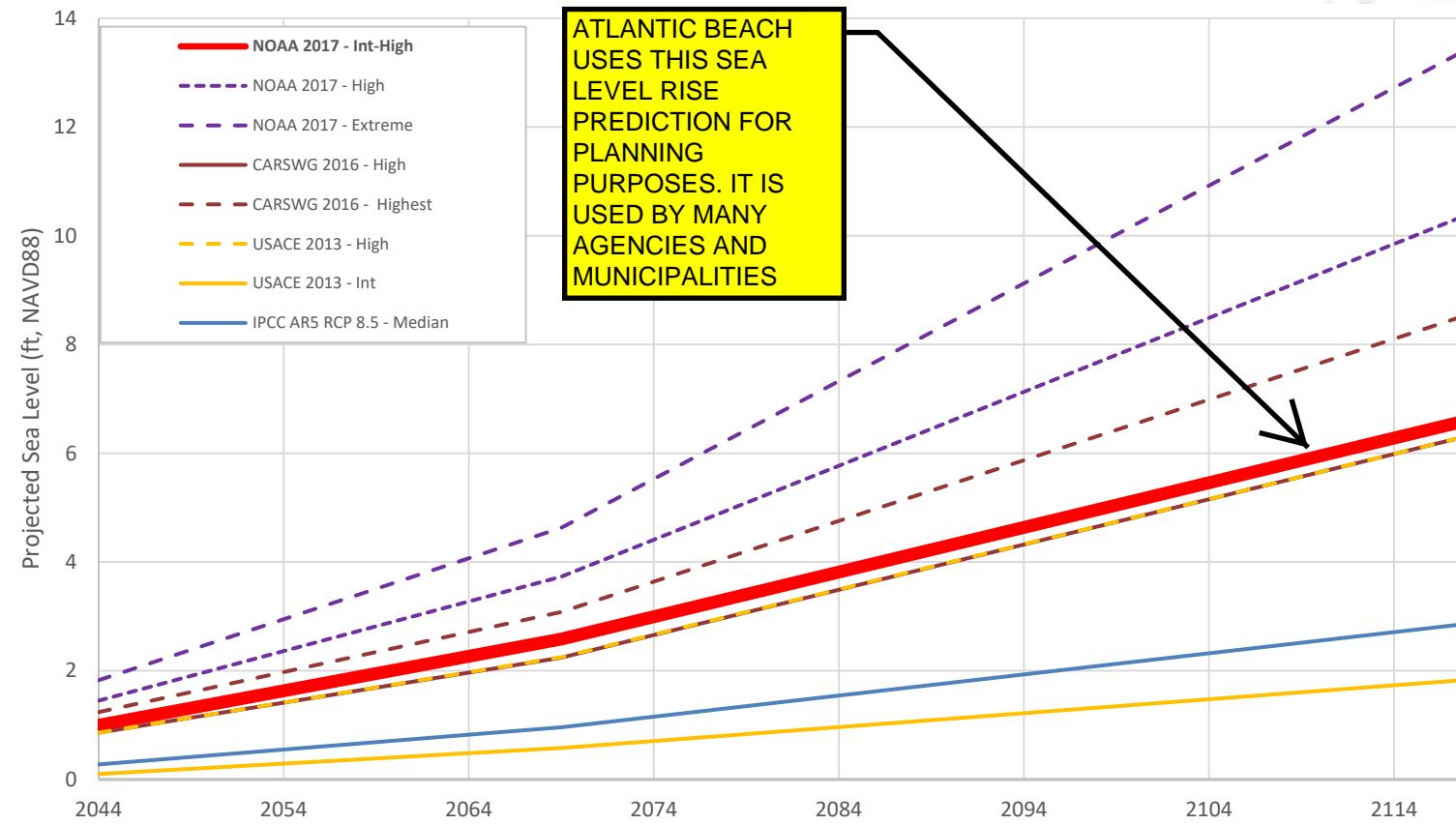
CASE 3: Further Increases in Runoff Due to Pavement and Lost Floodplain Storage Due to Fill



FEMA 100-Yr Flood Event



Estimates of Sea Level Rise at Mayport



WE ARE CONSERVATIVELY EXPECTING OVER 1 FT OF SEA LEVEL RISE IN THE NEXT 25 YEARS

Scenario	Projected Sea Level Rise (feet)
2044	1.06
2069	2.65
2119	6.75

100-Yr Flood in 2044



Case Study

August 2016 Storm Event

- 2.3" of Rain
- Storm Duration = 1 hour
- Resulted in ditch bank
overtopping and street flooding

THIS STORM WAS A TYPICAL AFTERNOON THUNDERSTORM EXCEPT THAT IT STALLED OUT OVER ATLANTIC BEACH, HENCE THE 2.3" OF RAIN.

IT IS A GOOD CASE STUDY BECAUSE IT HAPPENED DURING THE AFTERNOON AND PHOTOS AND MEASUREMENTS WERE ABLE TO BE MADE DURING AND AFTER THE STORM.

August 2016 Storm Event



NORTHEAST
CORNER OF
DRAINAGE DITCH
AT CUTLASS

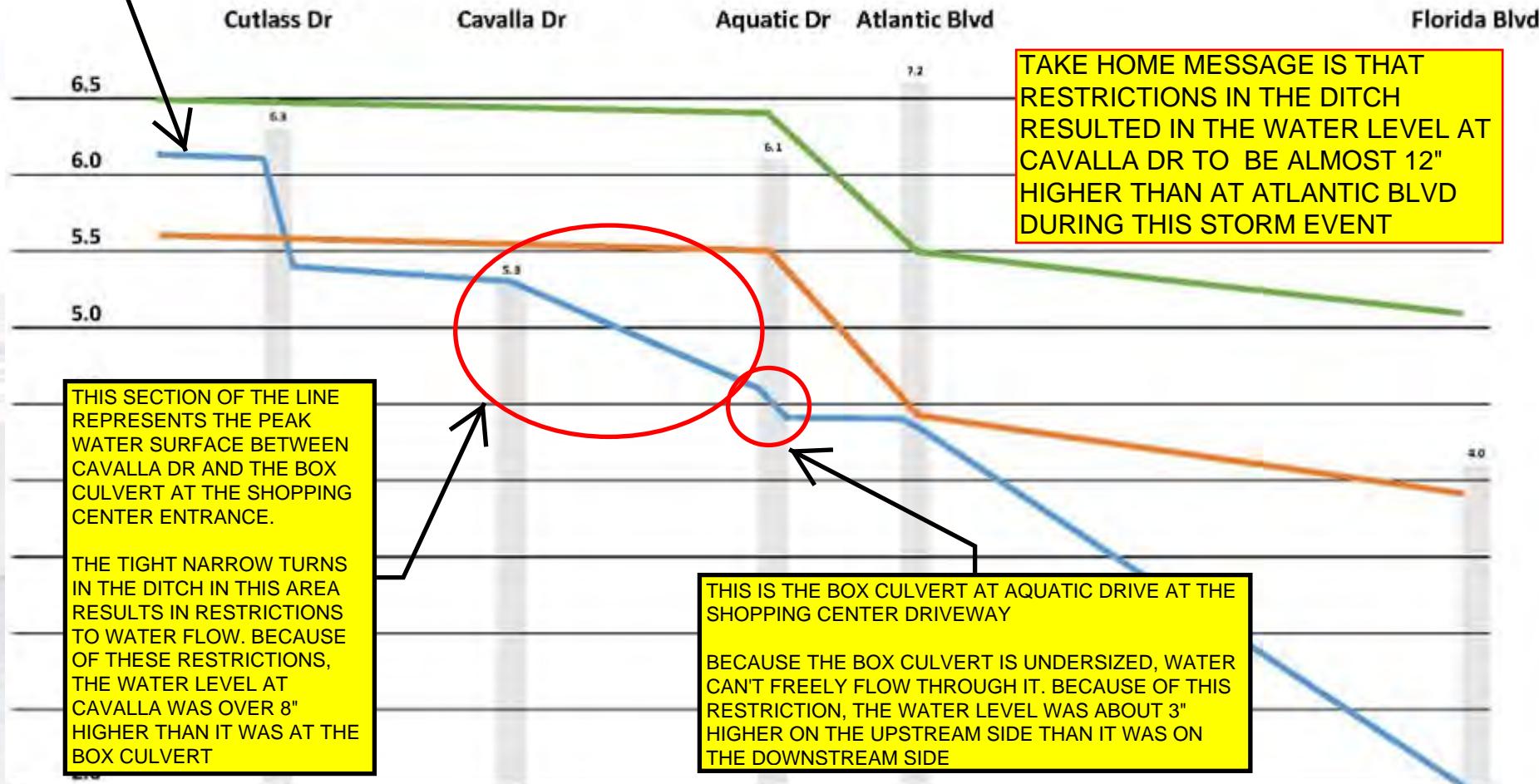
August 2016 Storm Event



DRAINAGE DITCH
FILLED UP FASTER
THAN THE POND
AND OVERTOPPED
THE POND BANK

BLUE LINE WAS THE
MEASURED WATER
LEVEL AT THE PEAK
OF THE STORM

Water Level Profile



August 3, 2016 Storm Event

10-Year Storm Event, Preliminary FIS Map

50-Year Storm Event, Preliminary FIS Map

Improvements Made to Date



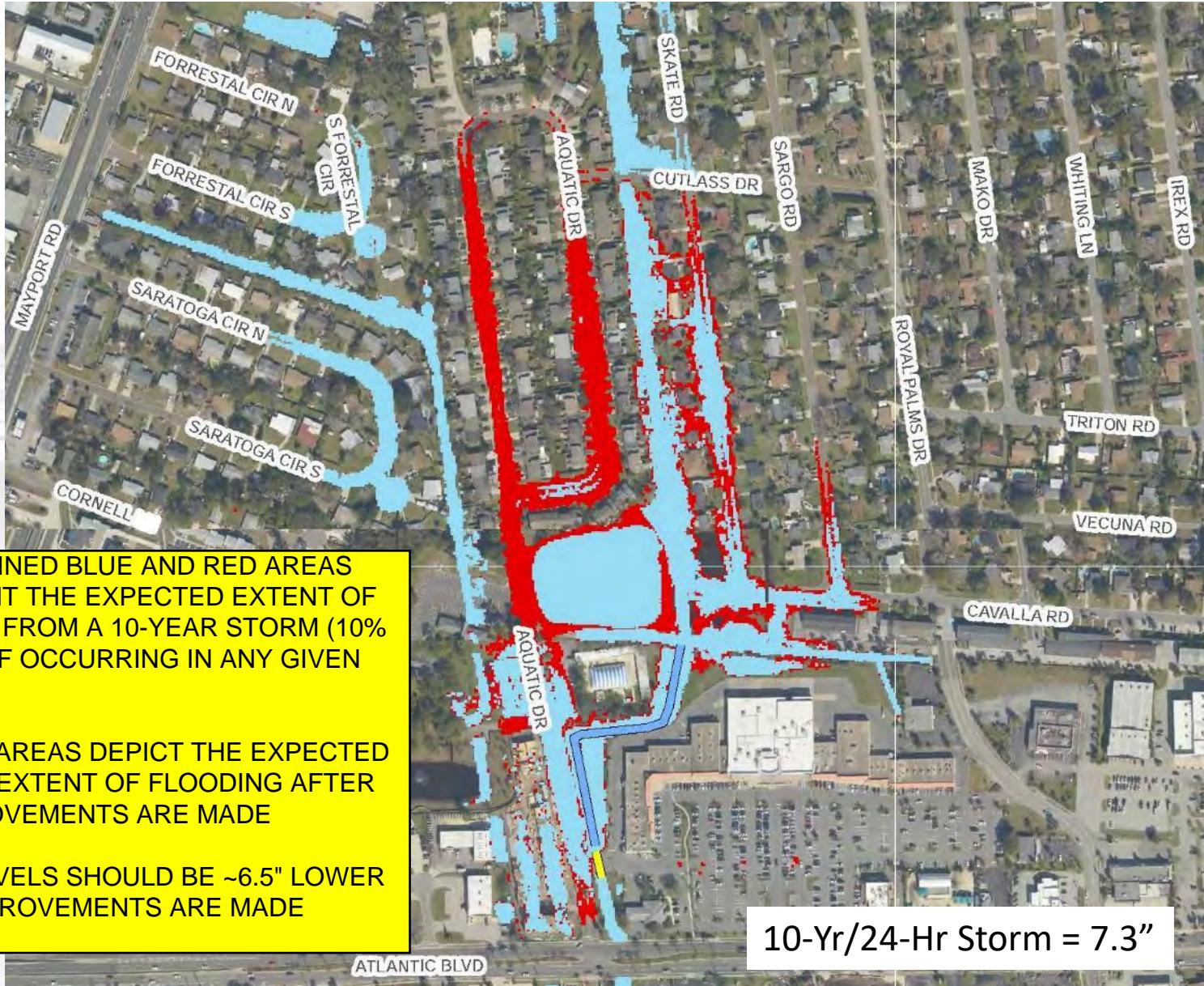
Proposed Improvements



Proposed Improvements



10-Year Flood Event



25-Year Flood Event



Timeline & Cost

Timeline

Design Complete	Nov 2020
Award Bid	Jan 2021
Complete Construction	Dec 2021

COMPLETE DESIGN PLANS AND PERMITS ARE EXPECTED BY THE END OF NOVEMBER.

THIS PROJECT WILL BE PRIMARILY FUNDED THROUGH A \$1.5M FEMA HAZARD MITIGATION GRANT (HMGP). THE GRANT HAS BEEN AWARDED TO THE CITY AND WHEN THE DESIGN AND PERMITTING ARE COMPLETED, FEMA WILL RELEASE THE CONSTRUCTION FUNDS.

RELEASE OF THE FUNDS SHOULD OCCUR QUICKLY ALLOWING CONSTRUCTION TO BEGIN IN THE FIRST QUARTER OF 2021

Cost

Design	\$314,000
Construction	<u>\$2,400,000</u>
Total Cost	\$2,714,000

Funding Sources

HMGP Design Grant	\$236,000 - Awarded
HMGP Construction Grant	\$1,500,000 - Awarded
Legislative Appropriation	\$200,000 - Awarded
CDBG-MIT Grant	<u>\$1,854,000</u> - Under Review
	\$3,790,000

With CDBG-MIT Grant award – Additional ditch widening and replacement of the box culvert at Cutlass Dr. will be completed

Future Improvements

- Enlarge Cutlass Dr. culvert
- Widen ditch to Plaza
- Work with Jax & Neptune Bch to enlarge Florida Blvd & Forrest Ave Culverts

IF THE CITY IS AWARDED THE CDBG-MIT GRANT WE APPLIED FOR, THESE IMPROVEMENTS COULD POTENTIALLY BEGIN NEXT YEAR

THESE TWO CULVERTS ARE UNDERSIZED AND CAN RESTRICT FLOW DURING SEVERE STORMS. ENLARGING THEM WILL HELP FURTHER REDUCE THE WATER LEVELS IN THE DITCH