MELROSE PARK STORMWATER MANAGEMENT SYSTEM

Tuesday, June 13, 2023
7:00 p.m.

A Community Conversation with Nancy J. Gassman, Ph.D.

Assistant Public Works Director - Sustainability

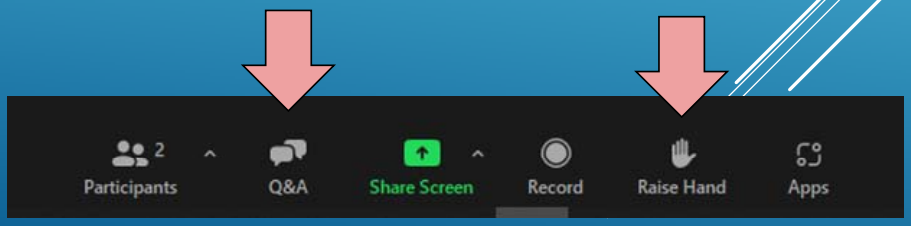
WELCOME

1) Agenda
   - 30 minute presentation
   - 30 minutes for questions

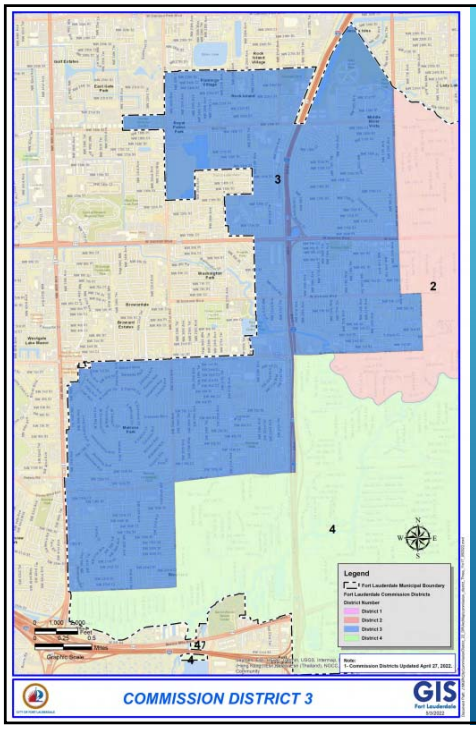
2) Goals
   a. Explain how the drainage system works
   b. Set expectations for level of flood protection
   c. Discuss why some storms caused flooding and others did not
   d. Describe maintenance activities
   e. Provide actions residents can take to reduce the potential for flooding

HOW DO I ASK A QUESTION?

a. Type it into Q & A at the bottom of the screen
b. Raise your hand in the virtual meeting
c. Listening on your phone?
   a. Enter *9 to raise your hand
   b. Enter *6 to unmute



Recording will be available at YouTube.com/Cityoffortlauderdale

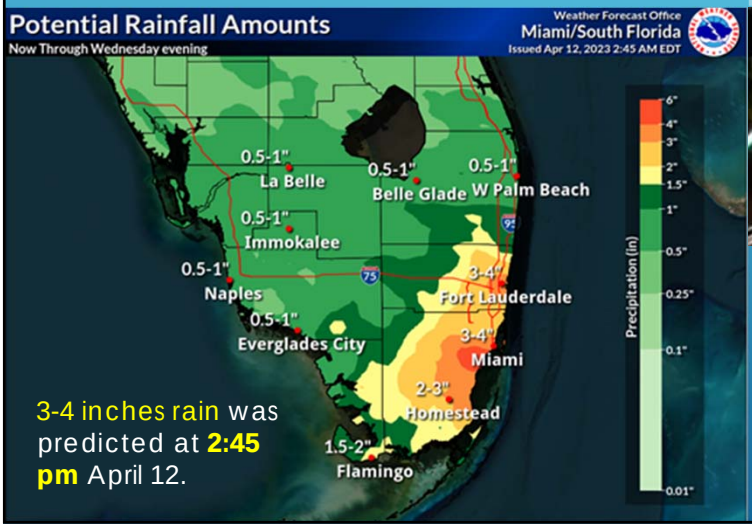


OPENING COMMENTS

Vice Mayor
Pamela Beasley-Pittman
District #3

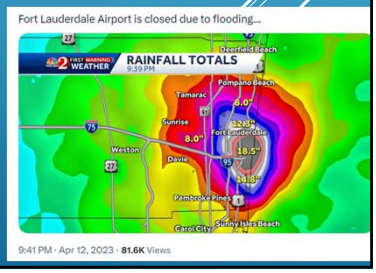
THE EVENTS OF APRIL 12

By **7:00 pm**, downtown streets flooded and blocked by stalled cars.



3-4 inches rain was predicted at **2:45 pm** April 12.

By **9:41 pm**, 18.5 inches of rain had fallen.



THE EVENTS OF APRIL 12

Historic downpour in Fort Lauderdale dropped 88 billion gallons of rain

The water would have covered the entire state of Florida in 0.07 inches of water

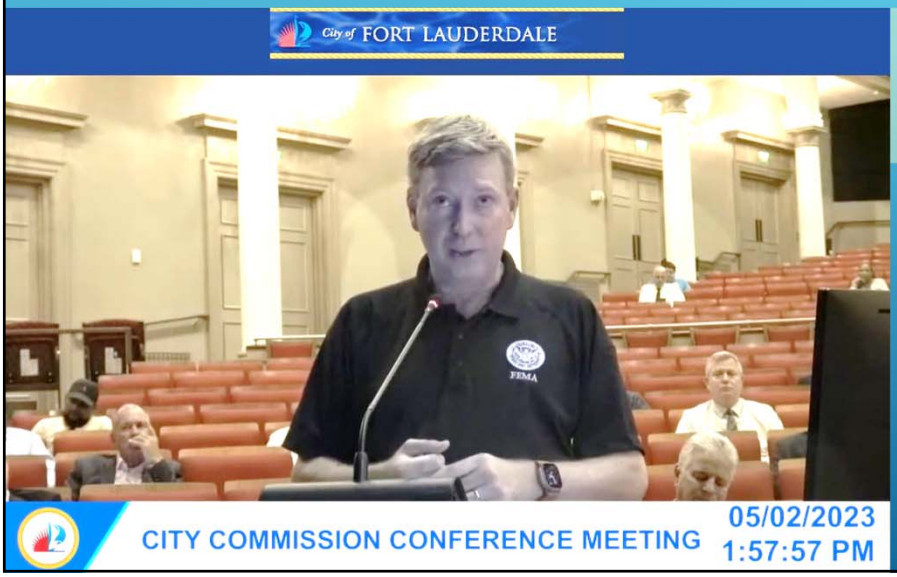
By Matthew Cappucci

April 14, 2023 at 11:50 a.m. EDT

Fort Lauderdale-Hollywood International Airport as viewed from West Perimeter road in Fort Lauderdale on Thursday. (Cristobal Herrera-Ulashkevich/EPA-EFE/Shutterstock)

It would have taken **29 MILLION pump truck loads** to remove that much water.

"Anytime you get 26 inches of rain in two days, it's going to flood in your area…"

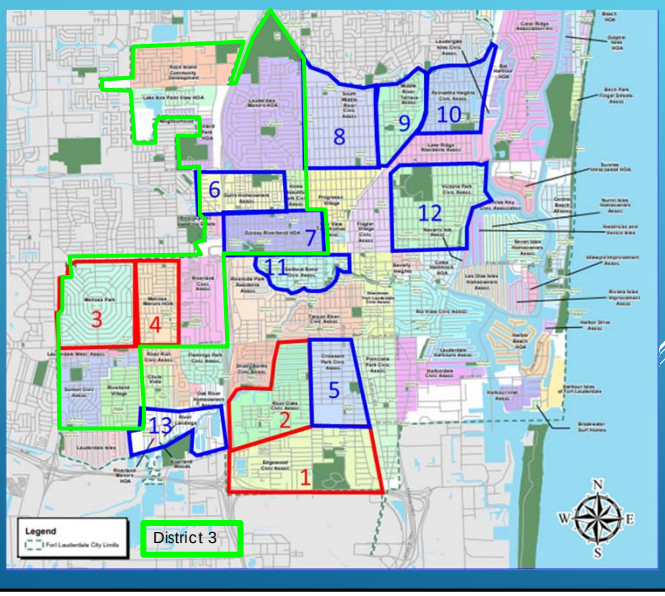


John Mills
External Affairs Officer
FEMA Management Assistance Team
Region 7

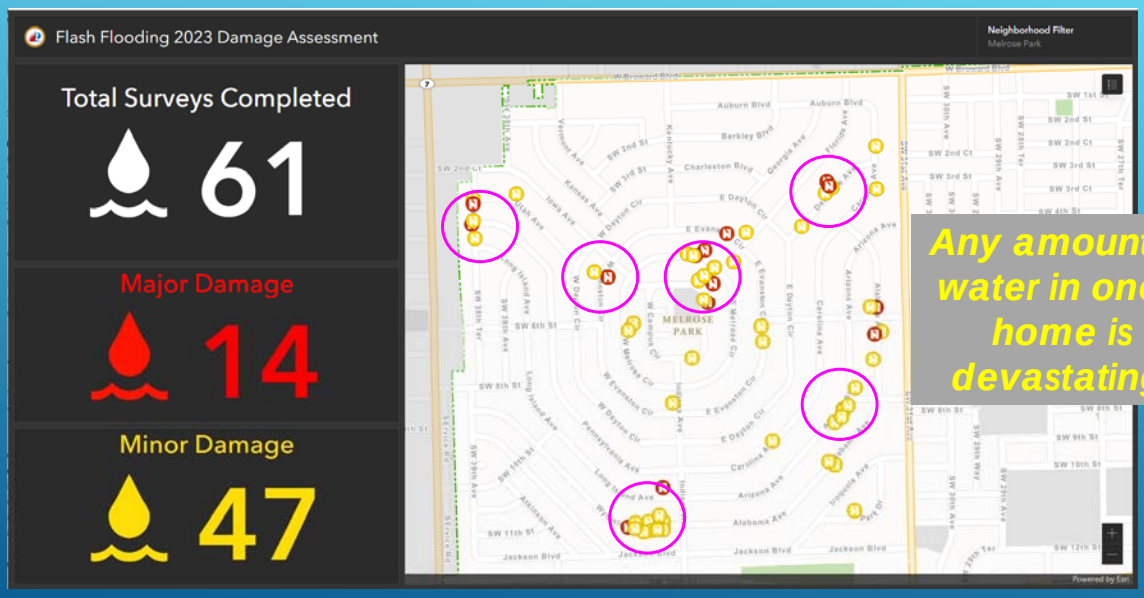
NEIGHBORHOODS INITIALLY REPORTING MAJOR IMPACTS - APRIL 12 FLASH FLOOD

Initial Flooding Assessments

1) Edgewood
2) River Oaks
3) Melrose Park
4) Melrose Manors
5) Croissant Park
6) Durrs
7) Dorsey Riverbend
8) South Middle River
9) Middle River Terrace
10) Poinsettia Heights
11) Sailboat Bend
12) Victoria Park
13) River Landing

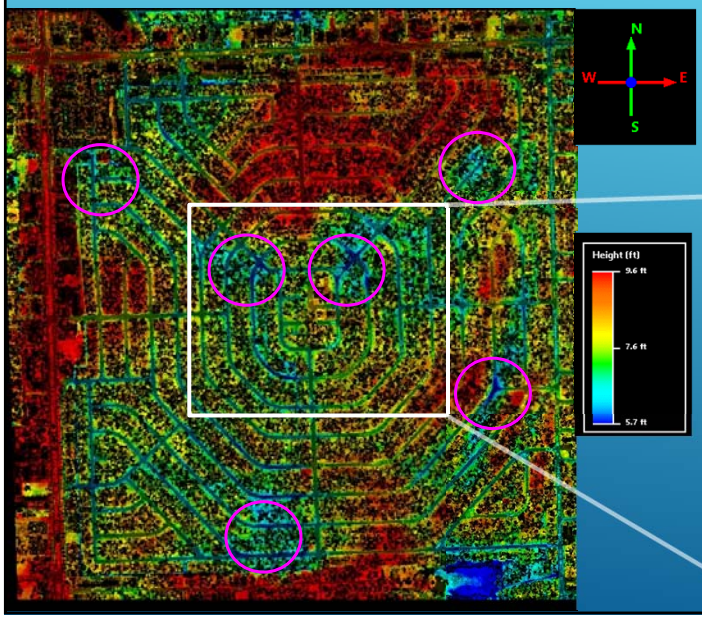


INITIAL FLOOD DAMAGE ASSESSMENT



Any amount of water in one's home is devastating.

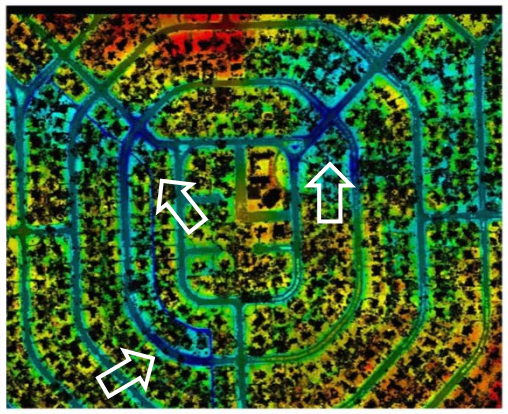
ELEVATION DATA



Red areas are high elevations compared to the lower blue area.

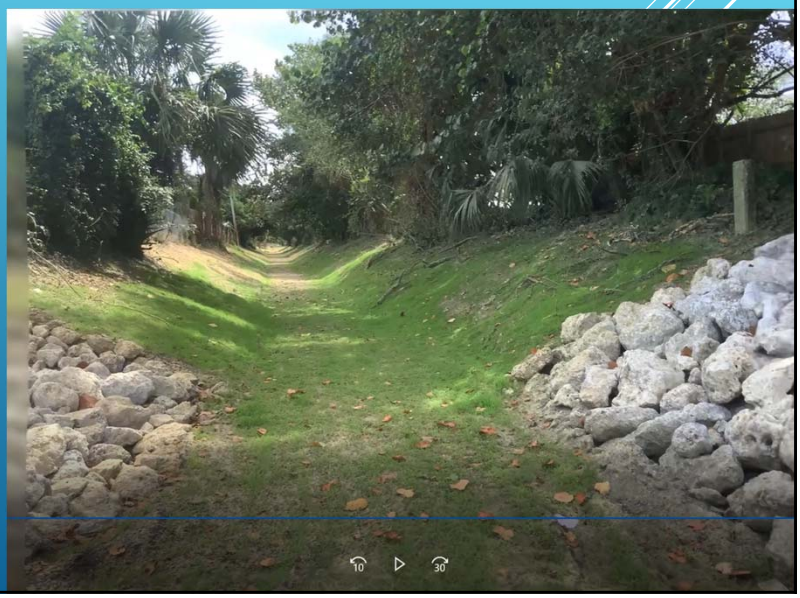
Melrose Park is shaped like a bowl.

Water flows to the lowest elevation.



SETTING REALISTIC EXPECTATIONS

HOW DOES THE MELROSE PARK DRAINAGE SYSTEM WORK?

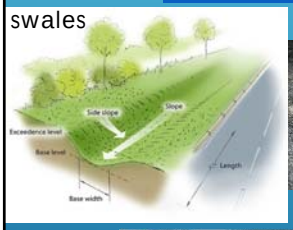


HOW DO DRAINAGE SYSTEMS WORK?

THREE MAIN COMPONENTS

COLLECTION

swales



catch basins

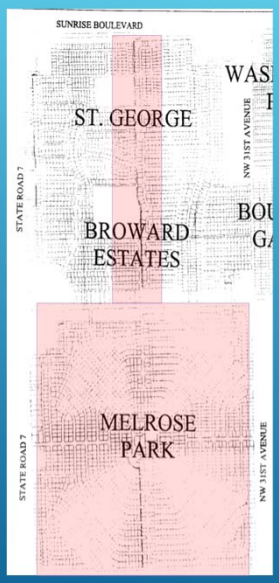
Melrose Park ditch

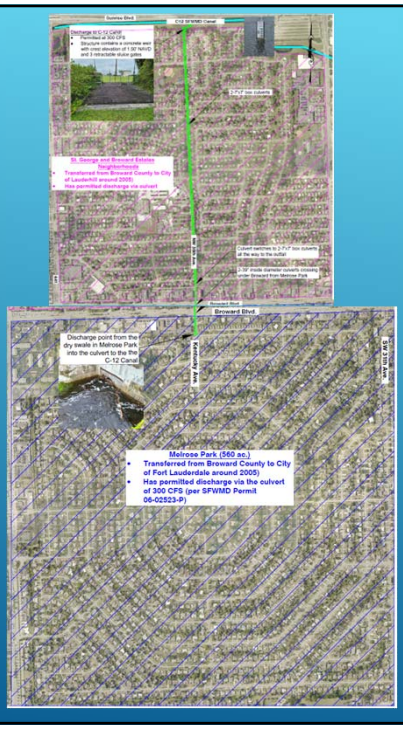
CONVEYANCE

pipes

DISCHARGE

outfalls





BROWARD COUNTY NEIGHBORHOOD IMPROVEMENT PROJECT

Broward County constructed a comprehensive drainage system in unincorporated Broward County with large culverts (green line) running north of Broward Blvd, discharging to the N. Fork of the New River at Sunrise.

Shortly after construction, **Fort Lauderdale** annexed Melrose Park

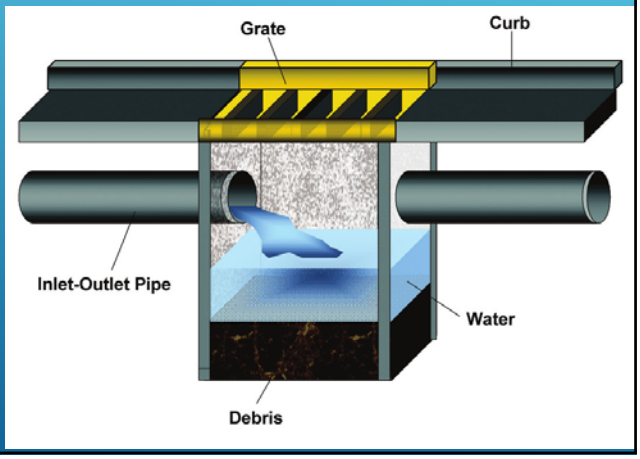
and

Lauderhill annexed Broward Estates and St. George.

DRAINAGE SYSTEM IN MELROSE PARK - CATCH BASINS

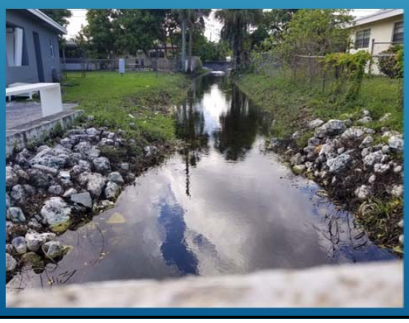
The Melrose Park neighborhood has 560 catch basins.

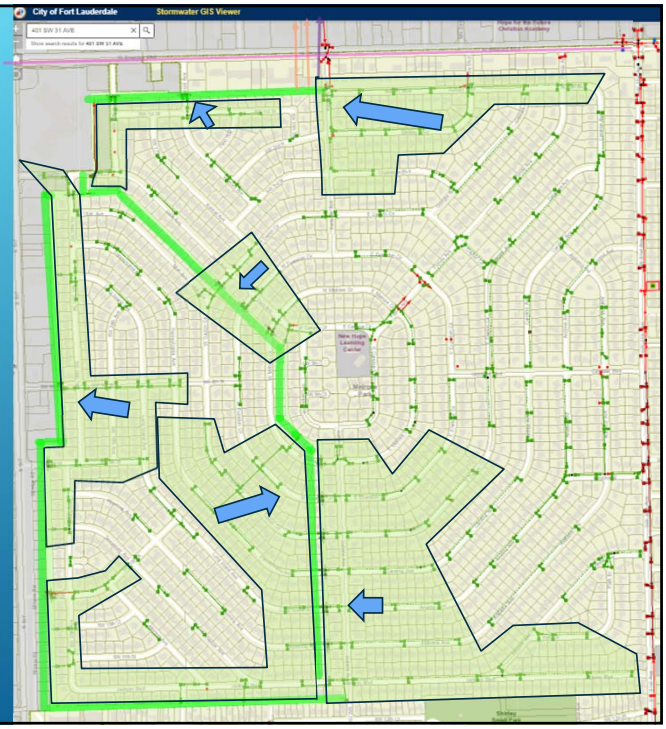
Approximately half are connected by underground pipes to the drainage ditch and the other half are connected to exfiltration trenches.



DRAINAGE SYSTEM IN MELROSE PARK - THE DITCH – DESIGNED TO HOLD WATER

Under normal conditions with low intensity daily rainfall, the connected catch basins (tiny green squares) convey stormwater to the ditch which holds it until it is absorbed into the ground.



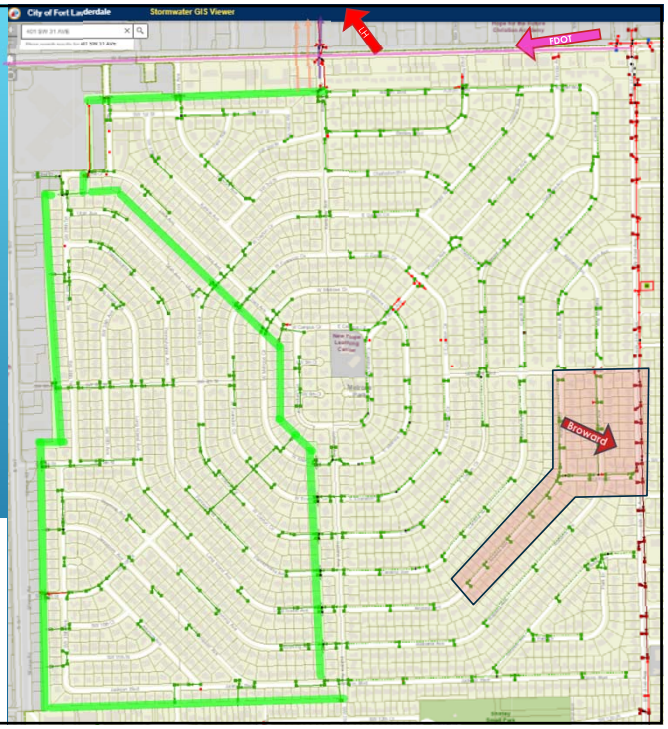


DRAINAGE SYSTEM IN MELROSE PARK - THE DITCH – DESIGNED TO HOLD WATER

During more extreme rain events, the ditch will begin to fill. When the stormwater level hits a specific elevation, it flows north to Kentucky and begins to discharge across Broward Boulevard into large culverts running north through Lauderhill.

DRAINAGE SYSTEM IN MELROSE PARK – ALABAMA, HOUSTON, AND ARIZONA

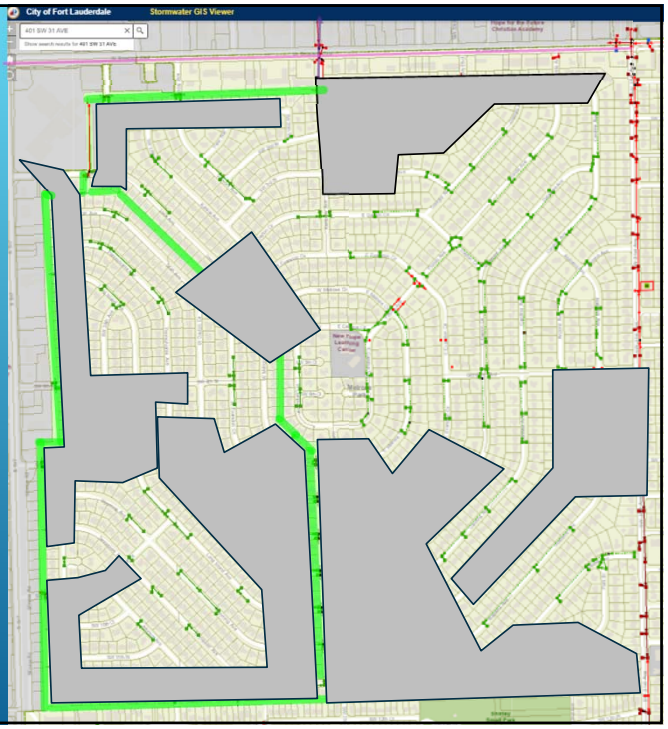
- The 40 catch basins in the pink box discharge to the **Broward County stormwater line** on SW 31st Ave.



DRAINAGE SYSTEM IN MELROSE PARK - CATCH BASINS

Areas in gray are connected to some type of outfall (drainage ditch or Broward County stormline).

The remaining catch basins are connected to exfiltration trenches.

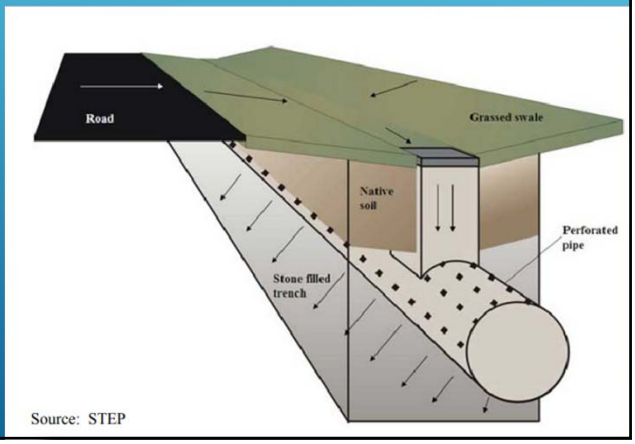


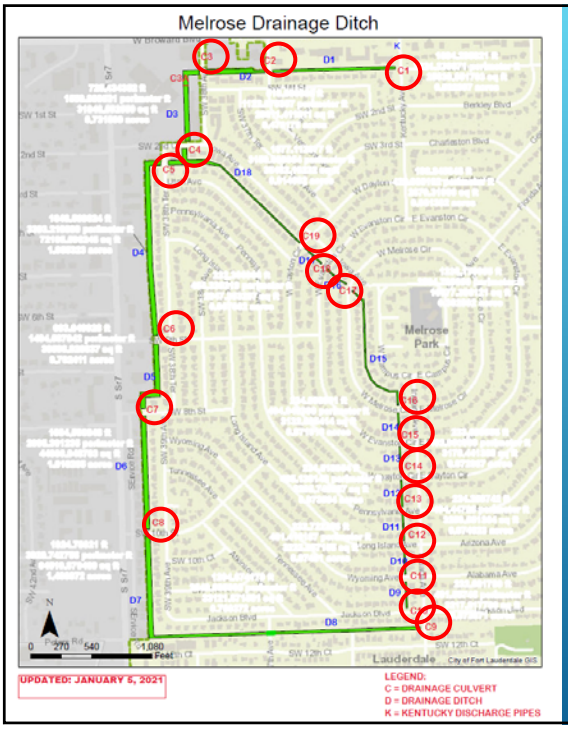
DRAINAGE SYSTEM IN MELROSE PARK - EXFILTRATION TRENCH

Trenches rely on percolation into the ground to drain stormwater.

They are completely independent of the drainage ditch.

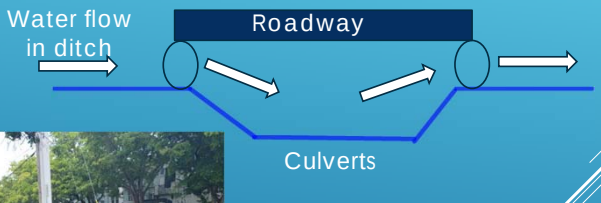
When the groundwater table is saturated, these areas cannot drain and the catch basins fill with stormwater.





DRAINAGE SYSTEM IN MELROSE PARK- CULVERTS

Cement culverts (C1-C19) allow stormwater to move under the roadways.



OVERVIEW OF DRAINAGE SYSTEM: CONCLUSION

- There are many components to the stormwater management system.
- All these components work together to provide drainage in Melrose Park.
- Like most systems in the City, the drainage is influenced by the groundwater table.

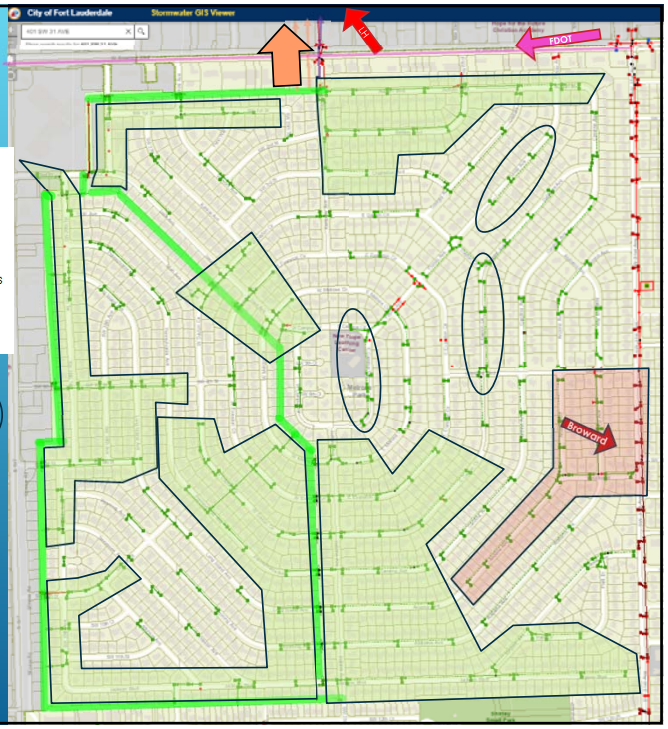
Inlet
- City
- County
- Private
- State
- All Other Values

Pond

E.g. areas with only exfiltration trench

Catch basin areas connected to the ditch

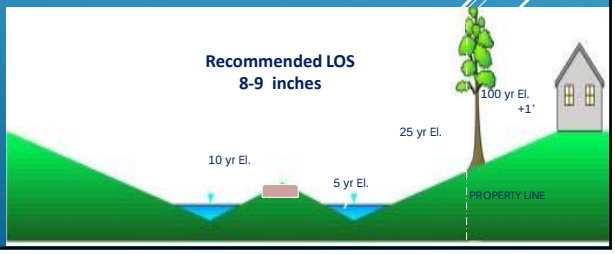
Catch basins connected to Broward County line on SW 31st Ave



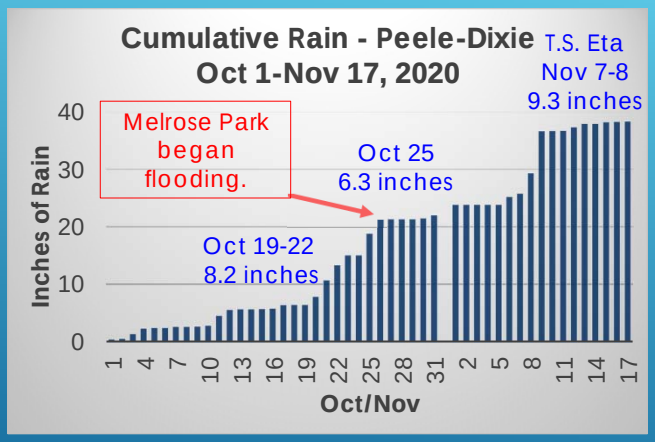
LEVEL OF SERVICE (LOS) DESIGN STANDARD

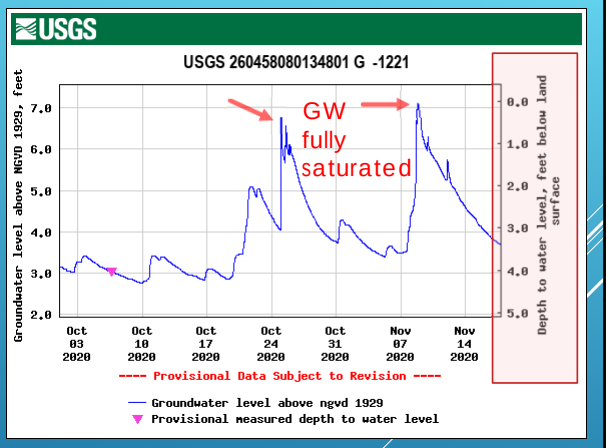
- Provides the baseline criteria to protect public safety/property
- Addresses high frequency/low intensity (typical daily) rain events
- Ensures that roads are passable for the majority of rain events

A higher LOS decreases the frequency, intensity and duration of flooding…but it is not always possible or affordable to achieve.



TROPICAL STORM ETA OCT-NOV 2020





Between Oct 1-Nov 9, 2020, the City received nearly 40 inches of rain. The groundwater table was about 4 feet below the surface coming into October. The 6 inch rain on Oct 25 and Tropical Storm Eta's ~10 inches of rainfall resulted in a fully saturated condition filling exfiltration trenches and leading to overland sheet flow of stormwater. This washed a significant amount of soil and other debris into the Melrose Park drainage ditch.

DITCH RECONSTRUCTION IN 2021

Grass seed applied in the drainage ditch

Reconstruct ditch:

- New soil/sand was added to re-establish design elevations and improve percolation; and
- Grass seed was spread throughout the ditch.

Drainage ditch becomes re-established

CULVERT RECONSTRUCTION IN 2021

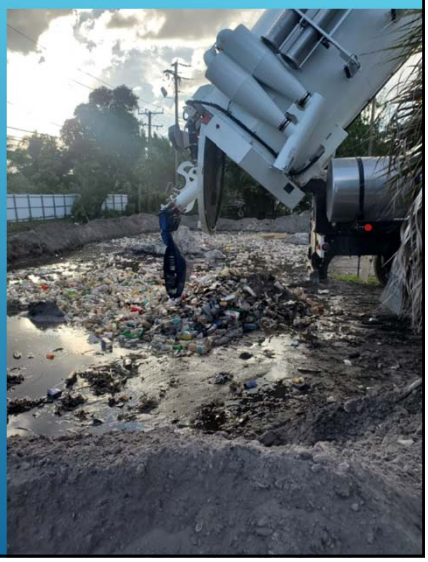
Reconstruct w/ improved cross section & material:

- Added new geotextile fabric;
- Added new rock to reduce erosion; and
- Re-established design elevations.

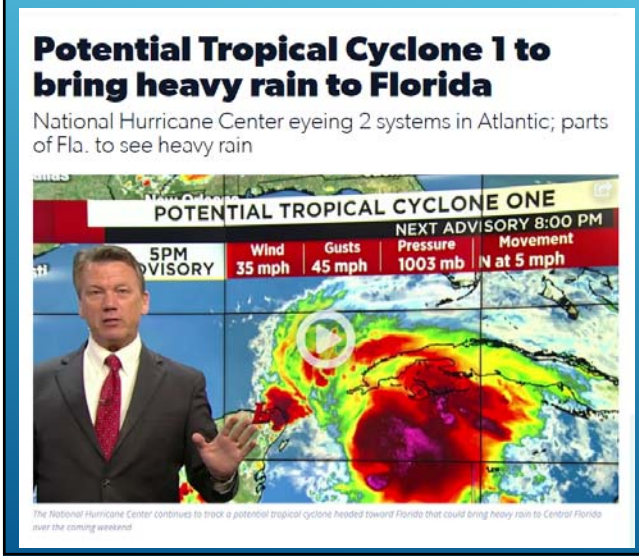
TROPICAL STORM ETA MITIGATION PERFORMED IN MELROSE PARK

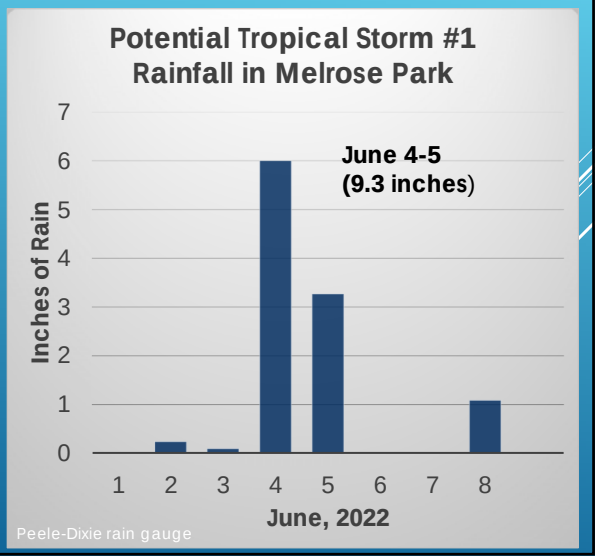
~COMPLETED JUNE 2021

1. Storm debris and accumulated silts were removed from the stormwater management system.
2. All 560 catch basins were pumped out.
3. Piping from the 250 catch basins connected to the ditch was flushed.
4. 2.5 miles of drainage ditch was returned to design specification and grass seed spread.
5. Culverts were re-rocked.
6. 19,000 sq feet of swales were rehabilitated.
7. Grate at the discharge point on Kentucky was replaced.
8. Conveyance through Lauderhill was inspected and cleaned.

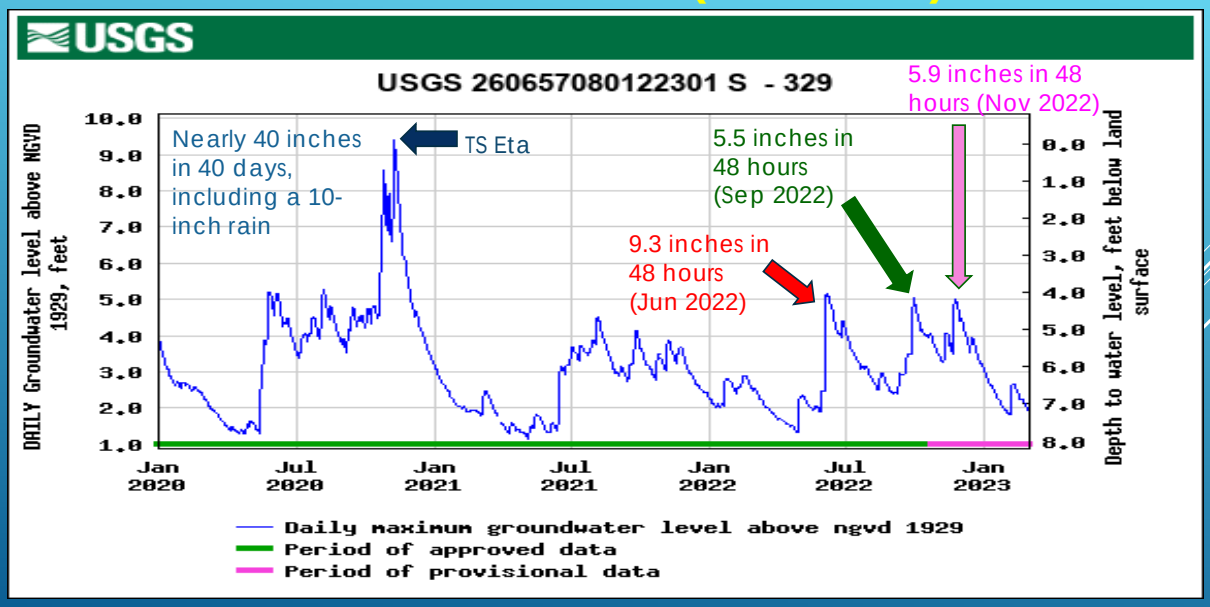


THE FIRST TEST…
POTENTIAL TROPICAL CYCLONE #1
JUNE 4-5, 2022





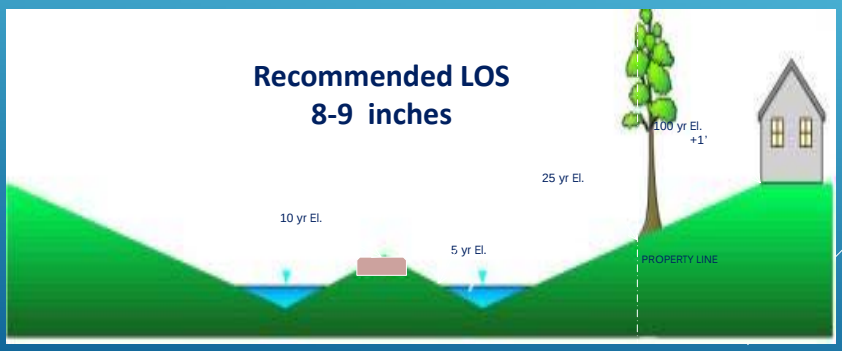
GROUNDWATER TABLE (WELL S-329)



https://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=260657080122301

LEVEL OF SERVICE (LOS) DESIGN STANDARD
CONCLUSION

- The rehabilitation of the Melrose Park drainage system resulted in an improved level of service.

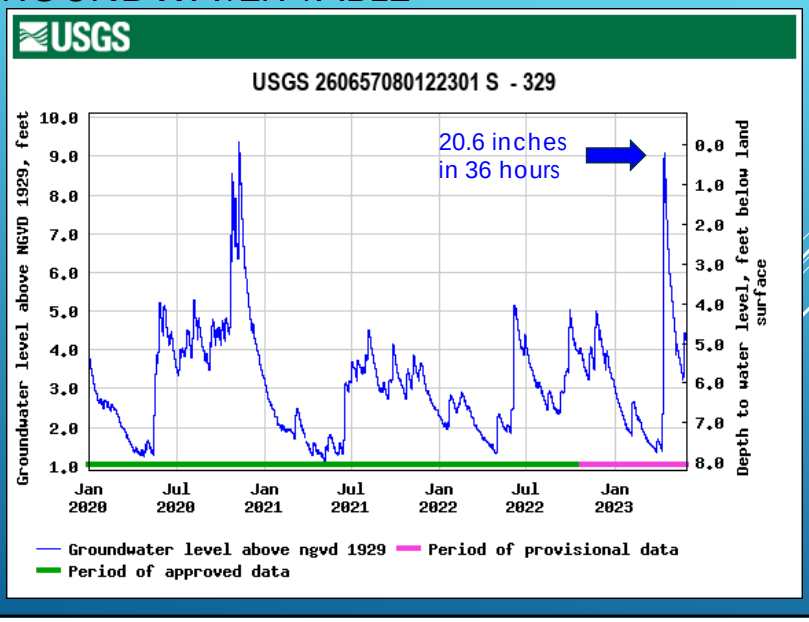


FLASH FLOOD – APRIL 12-13, 2023 (1000-YEAR RAIN EVENT)
GROUNDWATER TABLE

During the April Flash Flood, the groundwater table saturated.

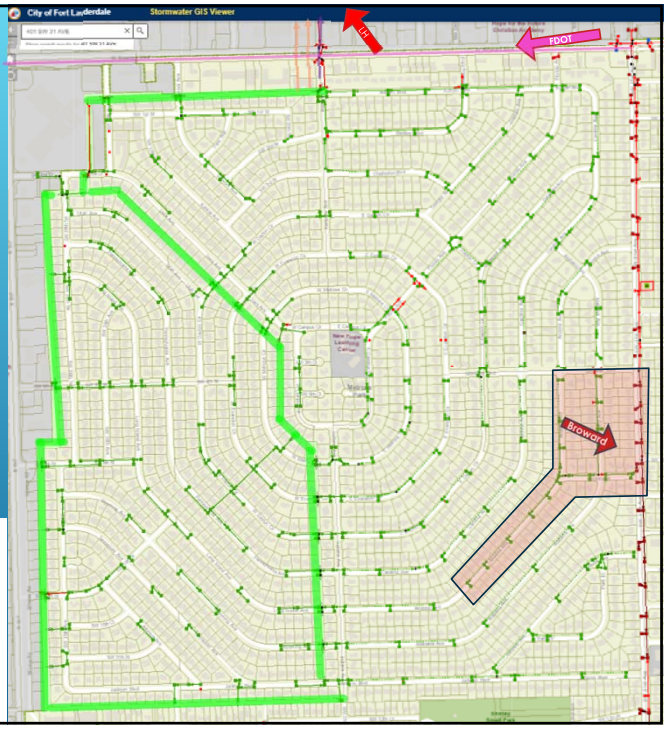
This prevented areas served by exfiltration trenches from draining.

It also caused overland flow, sweeping additional debris into the drainage ditch.



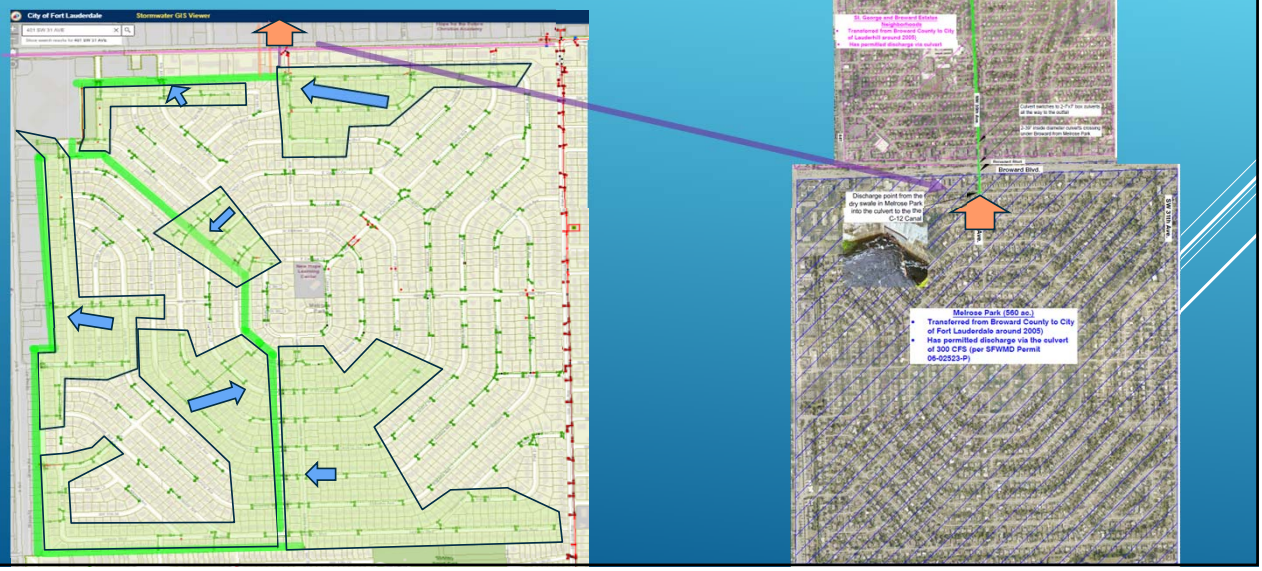
DRAINAGE SYSTEM IN MELROSE PARK – ALABAMA, HOUSTON, AND ARIZONA

- During April 12th flash flood, this pipe was surcharged for several days, preventing this area from draining.



FLOW OUT OF THE DRAINAGE DITCH

When the ditch is full, it is designed to discharge at Kentucky through Lauderhill to the North Fork of the New River.



WATER LEVELS IN SFWMD STRUCTURE S-33

DISCHARGE OUT OF THE DITCH WASN'T POSSIBLE UNTIL LATE FRIDAY, APRIL 14

This structure started actively discharge on April 11 in response to earlier rain events impacting western communities. Tailwater elevations did not return to a normal level until after April 20.

At Sunrise across from the Swap Shop.

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FLASH FLOOD – APRIL 12-13, 2023

CONCLUSION

- 1,000 year storm event resulting in City-wide impacts.
- Rain event substantially exceeded the design level of service for the drainage system.
- The groundwater table became saturated, preventing drainage in areas serviced by exfiltration trenches.
- Elevated water levels in the North Fork prevented the drainage ditch from being able to immediately discharge.
- No improvements to the stormwater management system could have prevented this flood.

CURRENT MAINTENANCE AND OPERATIONS

(FLYER MAILED NOVEMBER 2022)

Catch Basin Maintenance

- Twice per year pro-active inspections of all catch basins, cleaning, and repair as needed

Ditch Maintenance

- Monthly litter removal
- Mowing 8 times per year
- Bi-annual trimming of vegetation

Additional services added Nov 2022

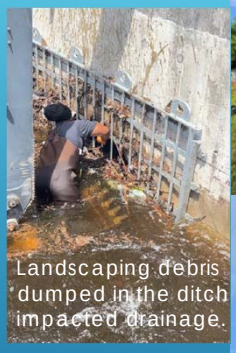
- Quarterly herbicide spraying at culverts
- Tree removal (2023/24 only)

HOW CAN YOU HELP IMPROVE FLOOD PROTECTION?

1. Immediately report illegal dumping of debris into the ditch (954/828-8000)
2. Educate and discourage residents from throwing vegetation and trimmings into the ditch
3. Remove double fencing trapping weeds and grass
4. Ensure access to the ditch

To maintain the ditch, access is required to both the left and right bank.

The installation of fences is preventing access to the ditch, impeding maintenance.



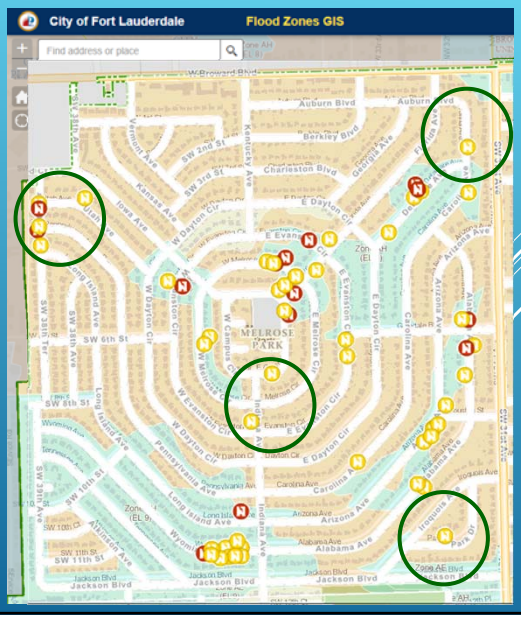
Landscaping debris dumped in the ditch impacted drainage.

Illegal dumping

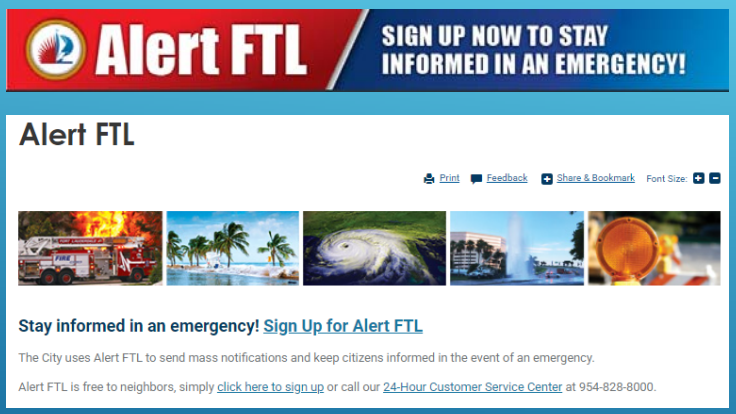
Double fencing

"If you live in Broward County, you need flood insurance."

"In Broward County, in Fort Lauderdale, you either live in a high-risk flood zone or you live near one."



HOW CAN YOU HELP IMPROVE FLOOD PROTECTION?



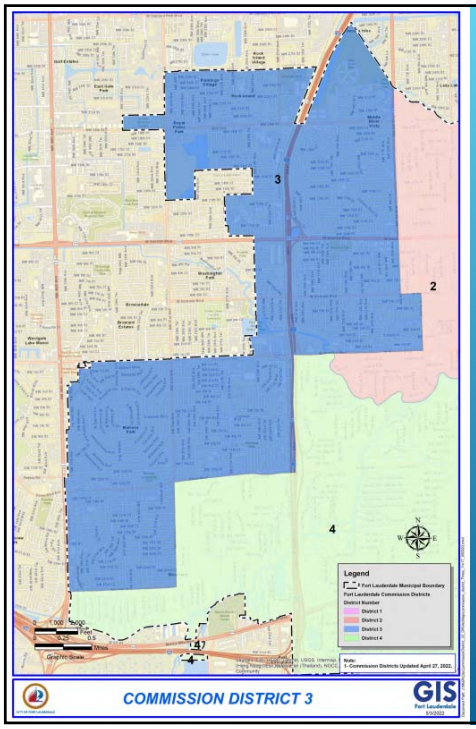
https://member.everbridge.net/892807736729056/login

Stay Informed

HOW CAN YOU HELP IMPROVE FLOOD PROTECTION?

CONCLUSION

1. Report illegal dumping
2. Keep landscape debris out of the ditch
3. Remove double fencing
4. Ensure access to the ditch
5. Get flood insurance
6. Stay Informed



CLOSING COMMENTS

Vice Mayor

Pamela Beasley-Pittman

District #3

QUESTIONS?

Report illegal dumping – 954/828-8000

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