



WS126. Rebuilding Utility Resilience: Pinellas County's Approach for Stronger Collaboration

Alex Boswell, Beth Grimaldi, and Callie Herold



Introductions

Alex Boswell



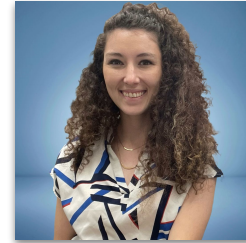
Emergency
Management
Coordinator,
Pinellas County
Utilities

Beth Grimaldi



Senior Operations
Analyst,
City of St. Petersburg
Water Resources
Department

Callie Herold



Planning Section
Chief,
Pinellas County
Utilities



What Are We Going to Cover?

- Introduction to Utilities
- PCU and St. Petersburg Utilities Organizations
- Utilities Hazards
- Collaboration
- Hurricanes Debby, Helene, and Milton Responses & Lessons Learned
- Looking to the Future
- Building & Maintaining Relationships with Utilities
- Questions



Introduction into Utilities

Public sector with private sector flair

Utilities isn't a fun photo op





Types of Water



Potable Water: Treated water that is safe to drink.



Raw Water: Fresh water that has not yet been treated to meet regulations for potability, generally surface water or water pumped from a well/aquifer.



Wastewater: Untreated raw sewage.

Types of Water



Partially treated wastewater: Sewage that has undergone some treatment but does not fully meet regulations.



Reclaimed Water: Wastewater that has been fully treated. It is safe to interact with, but not to drink. Generally used in irrigation or industrial cooling.



Stormwater: Rainwater and runoff that either soaks into the ground or is collected in retention ponds or storm sewers. NOT connected to the potable/sewage systems.

Pro-tip: If it's designed to let surface water (or evil clowns) in, it's a stormwater drain.

Know Your Infrastructure



Potable Water Treatment Facility:

Treats raw water to meet regulations to make it safe to drink.



Water Reclamation Facility:

Wastewater treatment plant that treats raw sewage. Once wastewater had been fully treated it is used for groundwater recharge or in the reclaimed water system.

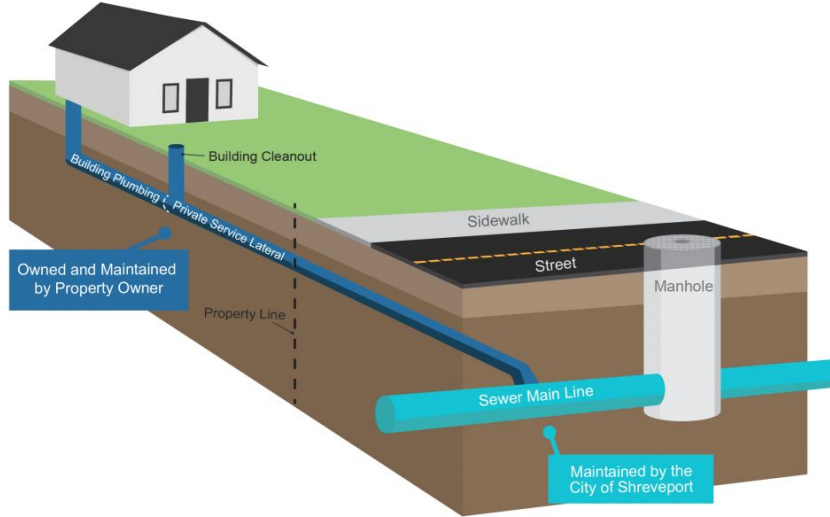
Know Your Infrastructure



Water Booster Station:

A system that increases water pressure in a water distribution network. It's used to overcome challenges like gravity, distance, and high demand to ensure adequate water pressure for domestic use, fire protection, and other needs.

Know Your Infrastructure



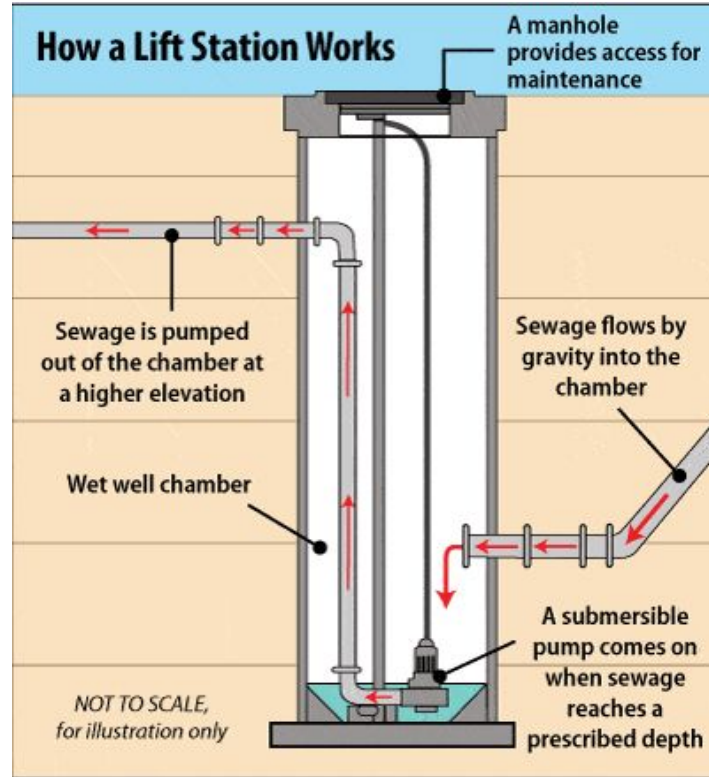
Lateral: The small-diameter pipes that connect private homes and business to the public water and wastewater systems.



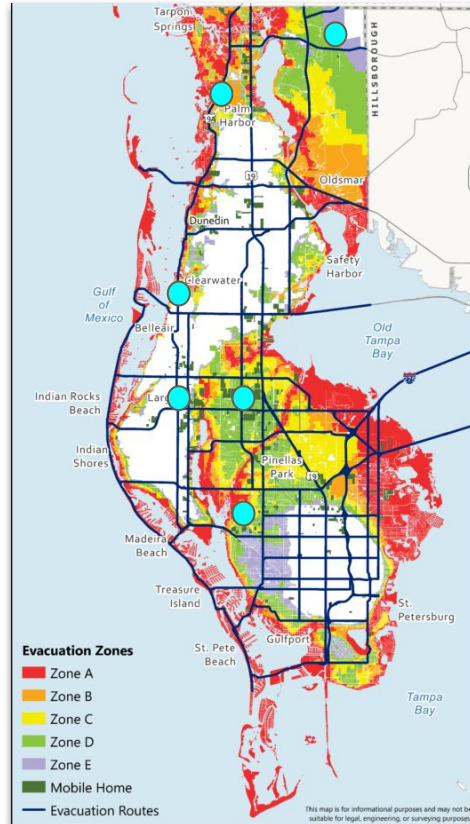
Lift Station (Pump Station):

Large pumps that keep wastewater moving through the wastewater system. (If a lift station is down, the system stops flowing.)

Just because you can't see it....



PCU Organization



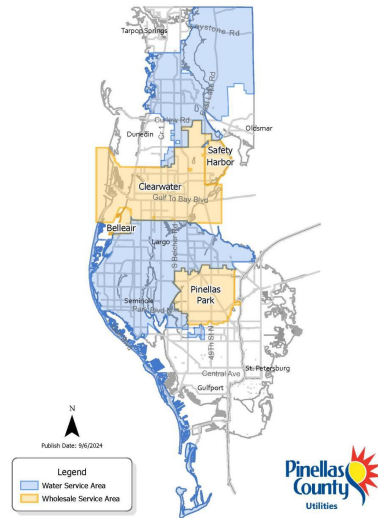
- **409 Employees across 6 Divisions but have 440 employee positions**
- **By the numbers:**
 - 1 potable water treatment plant
 - 2 potable pump stations
 - 1,998 miles of water mains
 - 2 wastewater plants
 - 299 lift stations
 - 1146 miles of sewer mains
 - 429 miles of reclaimed water mains
- **Provide wholesale wastewater service to 3 municipalities and potable water to 3 municipalities.**
- **Operates a Utilities Operations Center (UOC)**
- **Emergency Call Response**



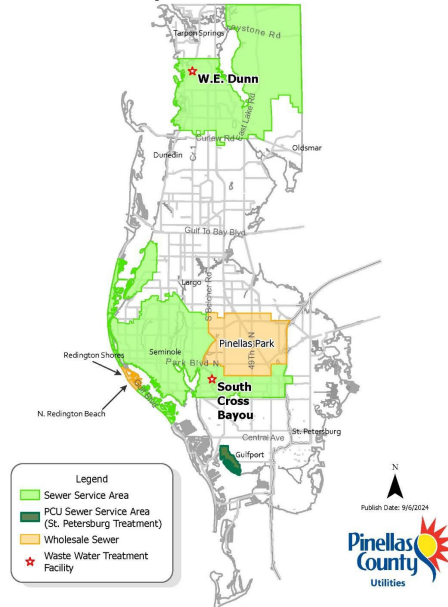
PCU Organization

PCU

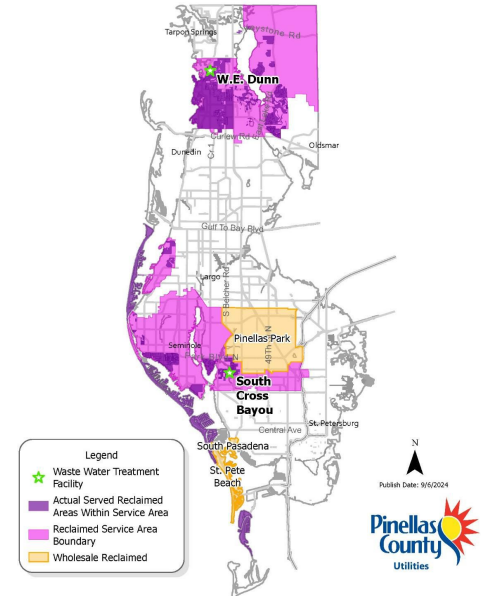
Pinellas County Utilities Water Service Areas



Pinellas County Utilities Sewer Service Areas



Pinellas County Utilities Reclaimed Service Areas

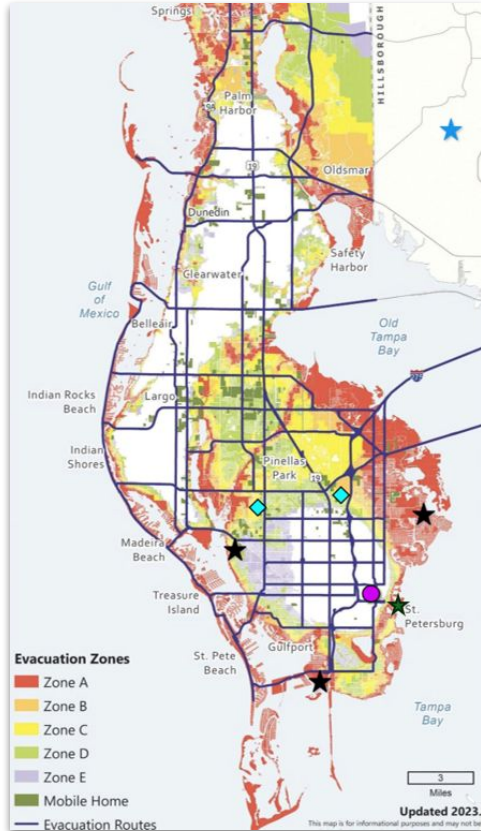


We Treat & Distribute 50 MILLION Gallons of Water Daily



X 75

St. Petersburg Organization

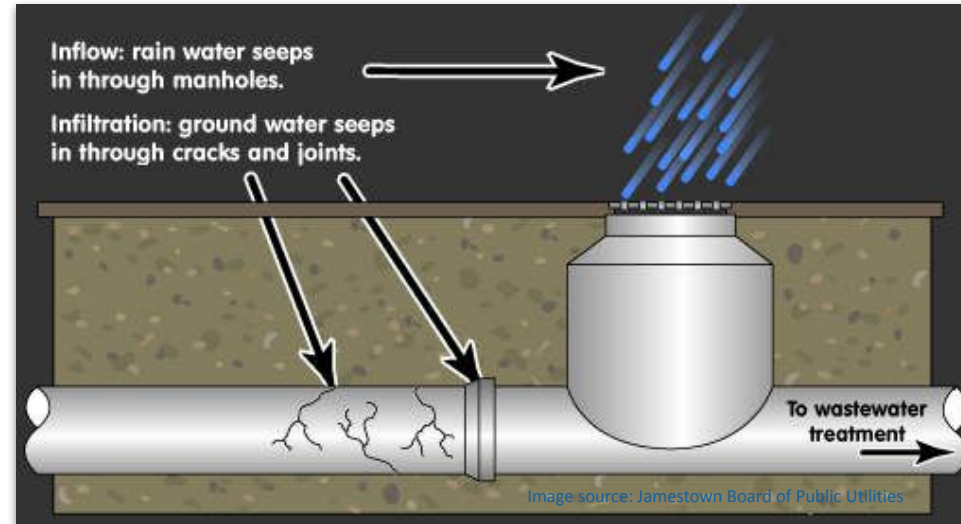


- 400 employees in 12 divisions split between wastewater, potable water, and administration.
- By the numbers:
 - 1 potable water treatment plant
 - 2 potable pump stations
 - 1,500 miles of water mains
 - 3 wastewater plants
 - 82 lift stations
 - 900 miles of sewer mains
 - 280 miles of reclaimed water mains
- Provide wholesale wastewater service to seven municipalities and potable water to two.
- Operate an EOC sub-center that houses six City departments.
- Operate one of only two public City phone lines staffed 24/7/365 (the other is 911).

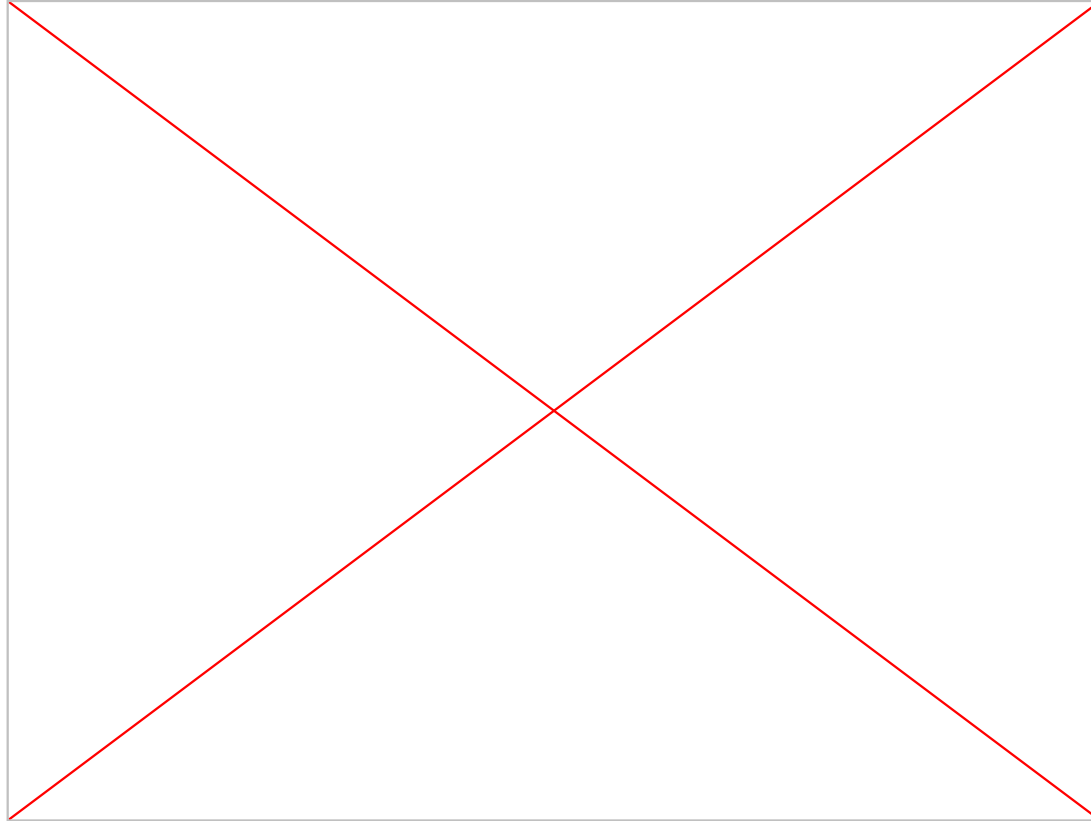
Storm Hazards for Water Utilities



- Flooding
- Damage to Facilities
- Inflow & Infiltration
- Water line breaks
- Unauthorized Discharges
- Power outages (lift stations, pumps, etc)
- People



People....



Every system has a capacity



Look at all the open tanks involved in wastewater treatment.

Now imagine adding 19 inches of rain and millions of gallons of stormwater to this system. When these huge storms come through, something has to give.



City of St. Petersburg Southwest Water Reclamation Facility

The PCU Journey



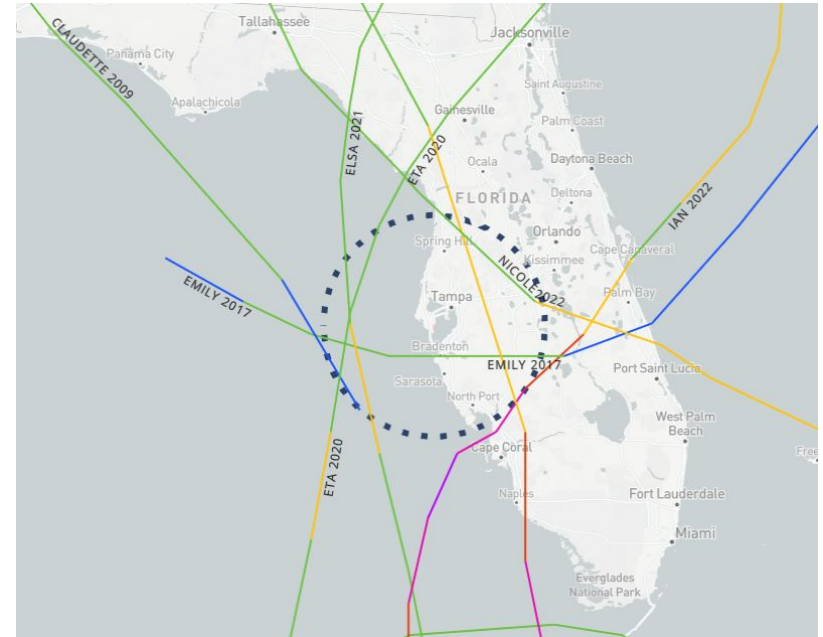
- New emphasis on emergency management with new leadership
- EM Coordinator now IC where as Director is Policy Group Leader
- Lots of changes to UOC including Planning Section, limited footprint, and a feeding plan
- Disaster roles tied to positions, not people with some exceptions



The St. Petersburg Journey



- A history of near-misses
- Recent focus has been on FDEP consent order and infrastructure improvement.
- No dedicated emergency management staff, but focus is changing.



NOAA Historical Hurricane Tracks
(www.coast.noaa.gov/hurricanes)

The Collaboration



- Blue Skies Collaboration led to Grey Sky Collaboration - quarterly calls in blue skies, day calls in grey skies.
- 1:00 pm Municipality Call EVERYDAY during Helene and Milton
- Understanding what's going on around us to better understand path forward
- Provides comfort to people around you and above you

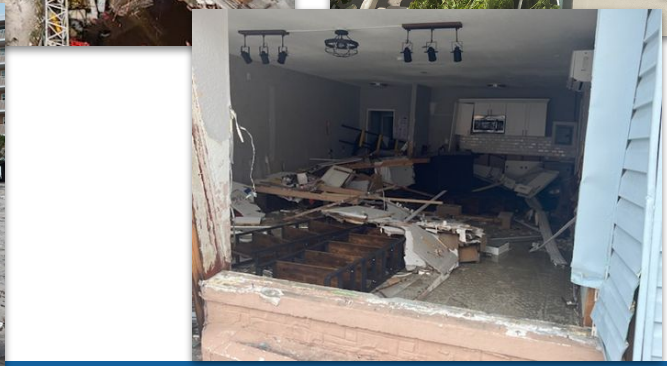
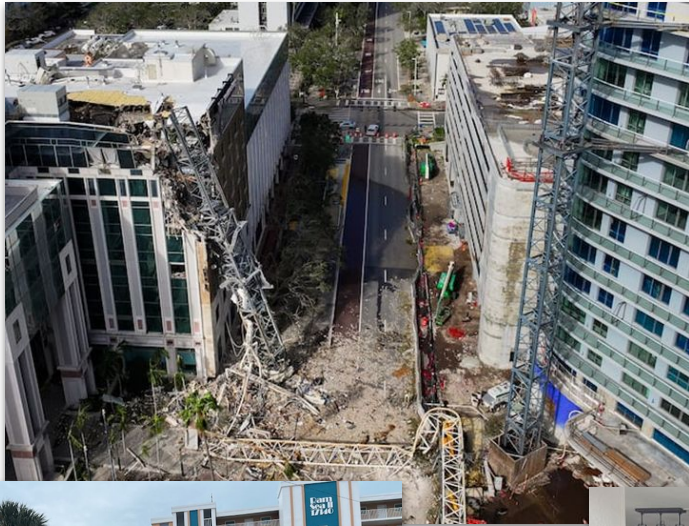
The Collaboration



- Who you gonna call?
- Mutual Aid From Group and through FlaWARN
- UOC to EOC
- Keeping the conversation going through Recovery



The Tale of 3 Storms





Highest 24-hr Rainfall

1. Dover	28.34 in.	Hillsborough	October 9, 2024	FAWN
2. Gibsonsia 7.6	18.75 in.	Polk	October 10, 2024	CoCoRaHS
3. St. Petersburg (SPG)	18.54 in.	Pinellas	October 9, 2024	ASOS

A Record Wet Year in Tampa and Ft. Myers

Despite drought at the start of the year along coastal west-central Florida, this region experienced multiple extreme rainfall events in 2024 associated with tropical cyclones Debby, Milton and, to a lesser extent, Helene, as well as an active weather pattern during the rainy season. As a result,

the Tampa area recorded its wettest year on record (134 years) with a total of 79.99 inches of rain, which was +30.51 inches above normal based on records dating back to 1891.

Fort Myers recorded its wettest year on record (113 years) with a total of 80.45 inches of rain, +23.04 inches above normal based on records dating back to 1892. Other stations along central and southwest coast experienced one of their top 5 wettest years on record: Sarasota, Bradenton, Naples, and Lakeland.

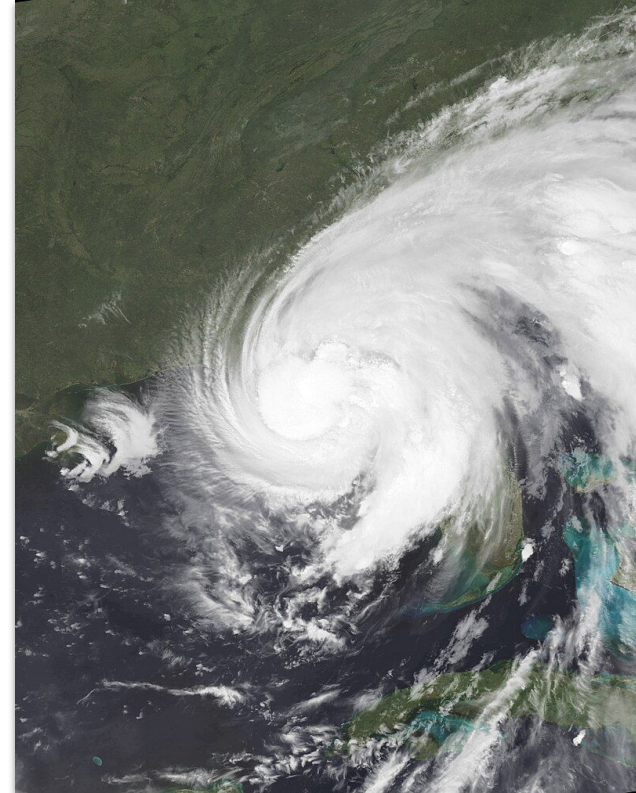
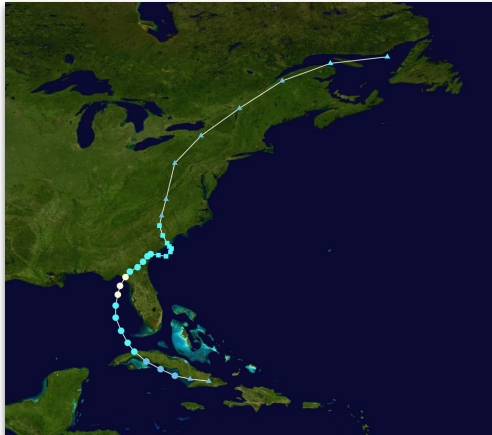
Florida Climate Center 2024 Annual Florida Weather & Climate Summary





Hurricane Debby

- Category 1 Hurricane at landfall
- Formed August 3
- Landfall August 8
- Organized over Cuba
- Damage is over \$4.5 B in total



Hurricane Debby - August 5, 2024



PCU

- Allowed us to test our changes (ie Planning Section, Forms, Feeding, etc)
- Has some pump station lose power but back online with in a day or so
- Increase in water to the plants due to rain

St. Pete

- Relatively minor impacts to St. Pete - flooding in low-lying areas but no significant damage to infrastructure.
- Partial activation of the EOC sub-center, but very limited staff sheltering in place.
- Biggest issue was elevated wastewater flows - 10+ inches of rain strained capacity of WRFs.
- First of three heavy rain events to saturate the ground with unprecedented rainfall, impacts continued to be felt during Helene/Milton.

Lessons Learned: Hurricane Debby



PCU

- Things are going to break when you try them out - be flexible and adaptable
- Make sure everyone is in the room for the After Action
- Ovens don't come with power cords

St. Pete

- Flooding could occur in areas where we'd never seen it before, and that our plans needed to be expanded to go beyond "the usual suspects".
- Small activations can be effective activations.

Helene and Milton



Helene

- Category 4 Hurricane at landfall
- Formed September 24
- **Landfall September 26**
- Formed in the Caribbean
- Damage is over \$78.7 B in total

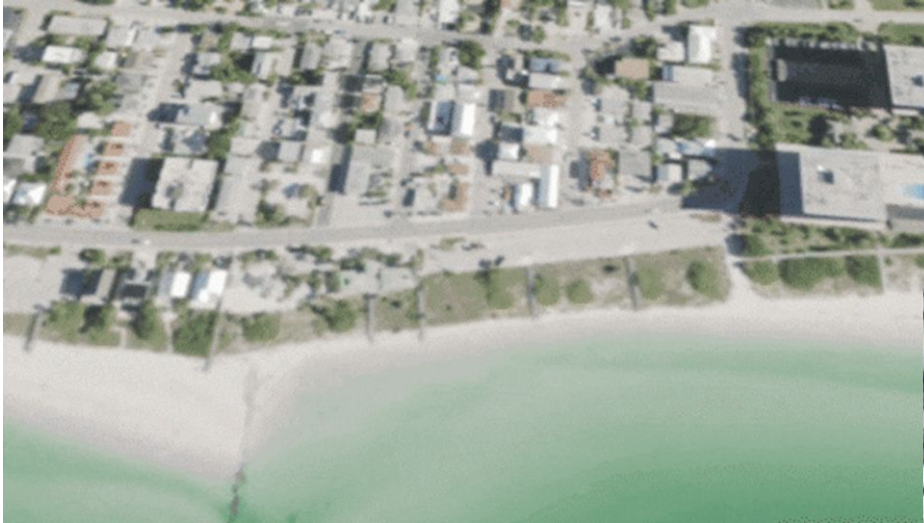


Milton

- Landfall as a Category 3 but was at one point a Category 5
- Formed October 5
- **Landfall October 9**
- Formed near Mexico
- Damage is estimated \$34.3 B



Hurricane Helene - PCU Impacts





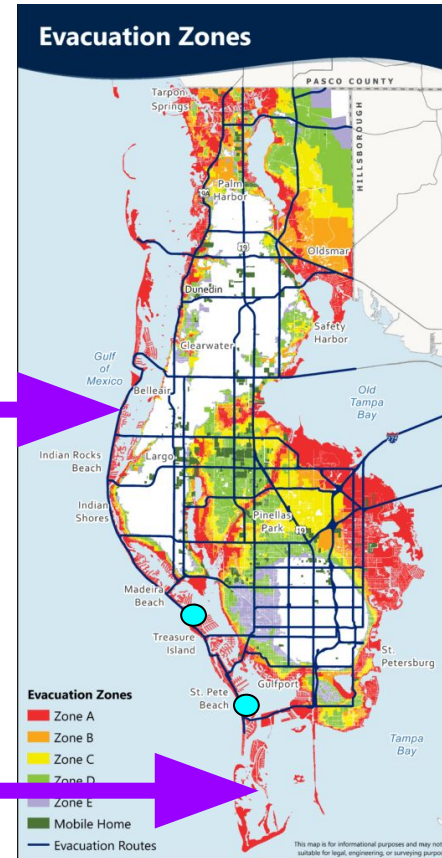
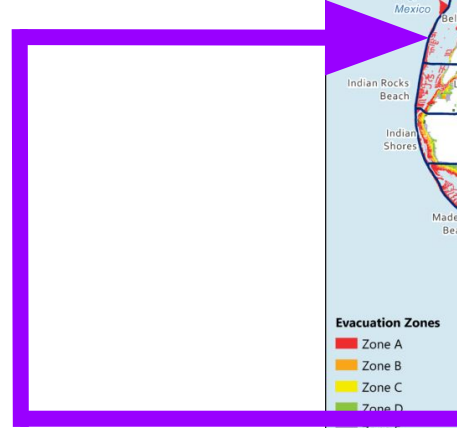
Hurricane Helene - PCU Impacts

- 100/300 lift stations lost power
- Boil water notice issued due to Gulf Beach Booster
- 926 Work orders put into City Works
- HUNDREDS OF BREAKS Across the Islands
- Gulf Beach Booster Station took on water and couldn't function normally



HUNDREDS OF BREAKS

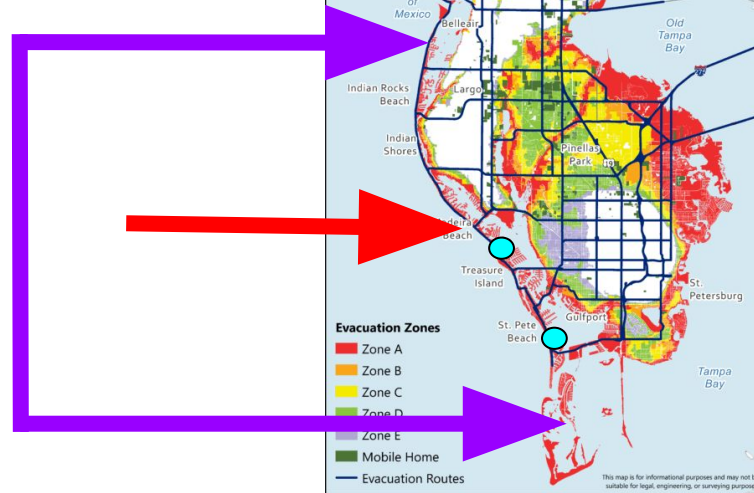
PCU services this
area of the barrier
islands for potable
water



HUNDREDS OF BREAKS



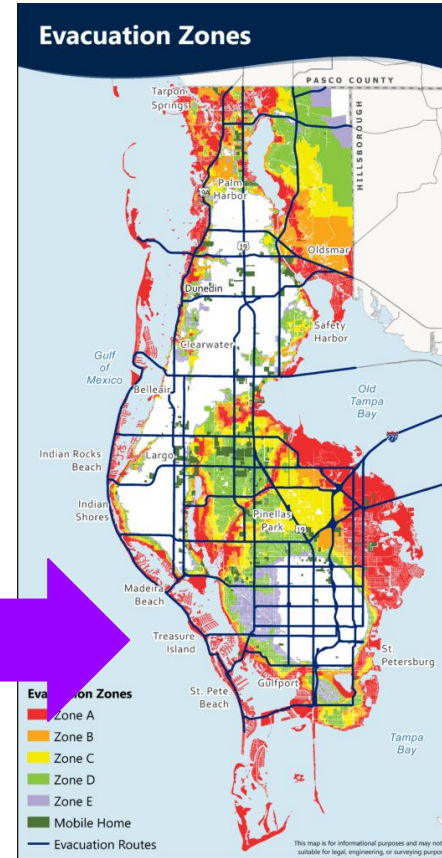
We cut off the water
starting here and
everywhere south



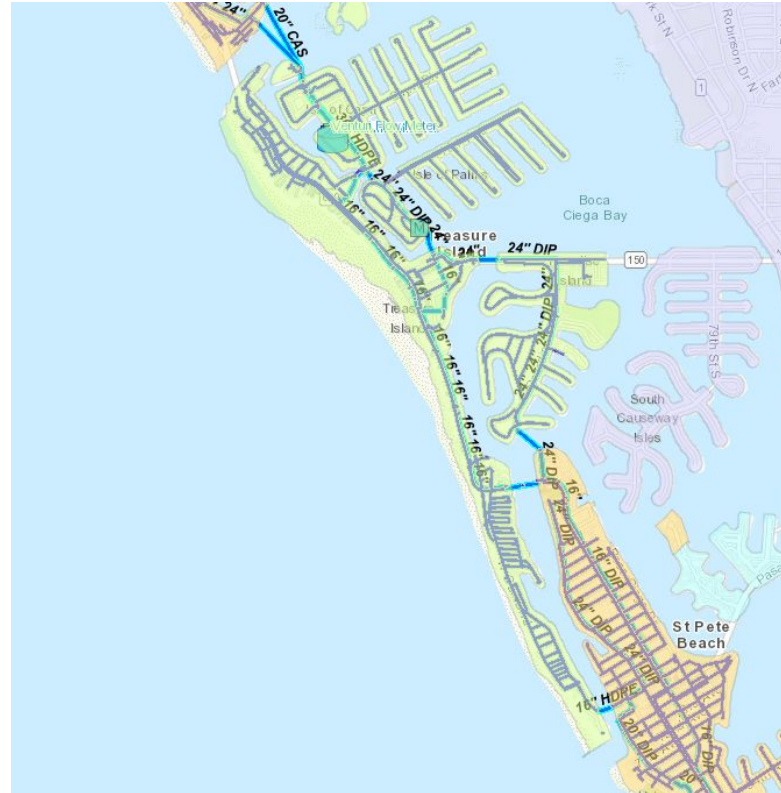
HUNDREDS OF BREAKS



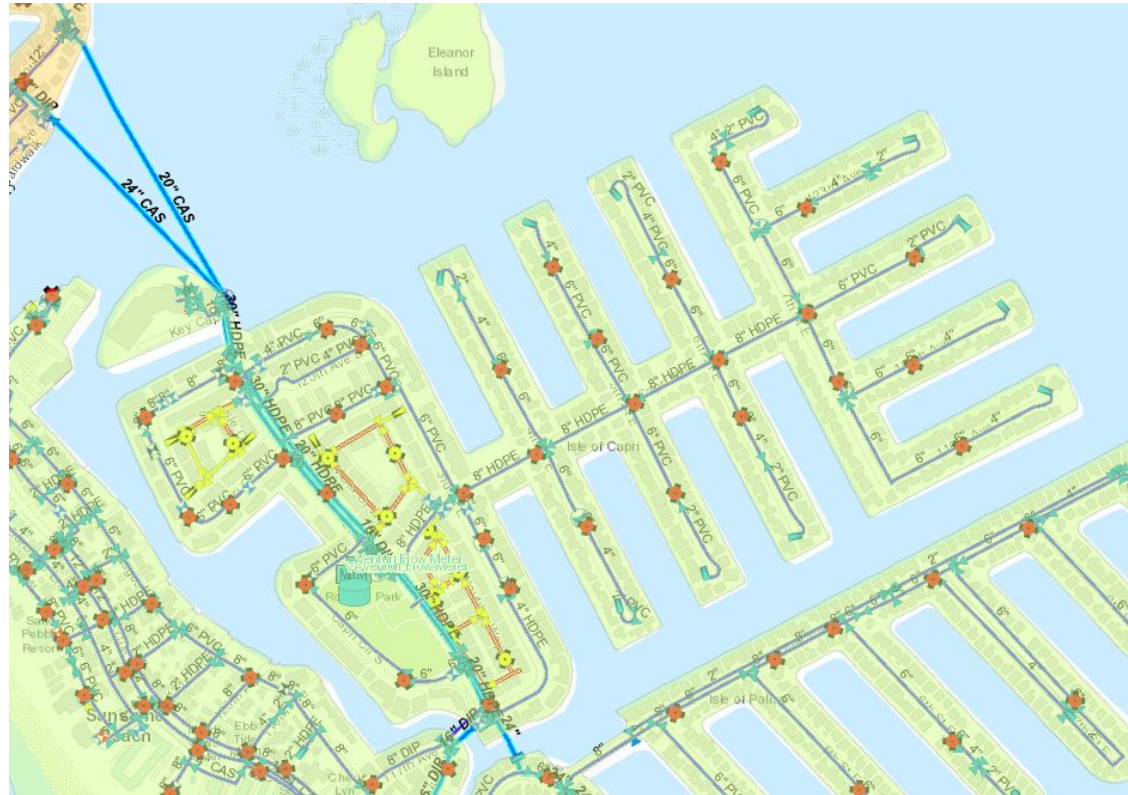
Let's look at
Treasure Island



HUNDREDS OF BREAKS



HUNDREDS OF BREAKS



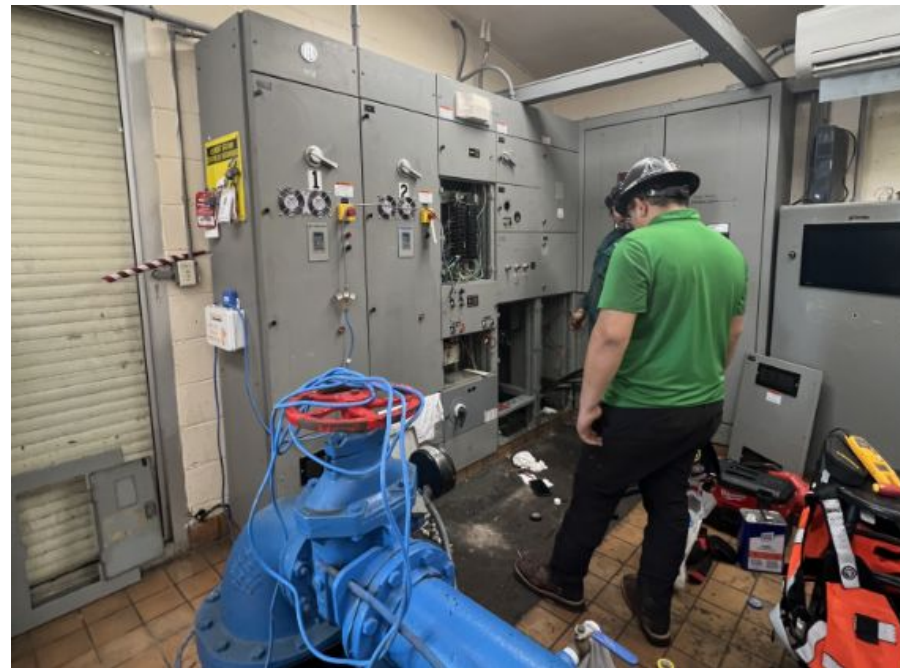
HUNDREDS OF BREAKS



HUNDREDS OF BREAKS



Gulf Beach Booster Station



Stuff EVERYWHERE



Hurricane Helene - PCU Response



- Meter by Meter shut off
- Received help from several partners including Dunedin, St. Pete, and TOHO
- Getting on and off the Islands took 30+ minutes one way
- Feeding Issues
- Power Issues to Pump Stations and trying to get Booster Back online



Hurricane Helene - St. Pete Impacts



- Fewer impacts to St. Pete than the barrier islands, but still very significant flooding in low-lying neighborhoods
- St. Pete had to de-energize a wastewater treatment plant for the first time in 39 years.
- Evac plan developed after a close call during Idalia was insufficient and had to change on the fly



The road to get out of
NEWRF during Helene

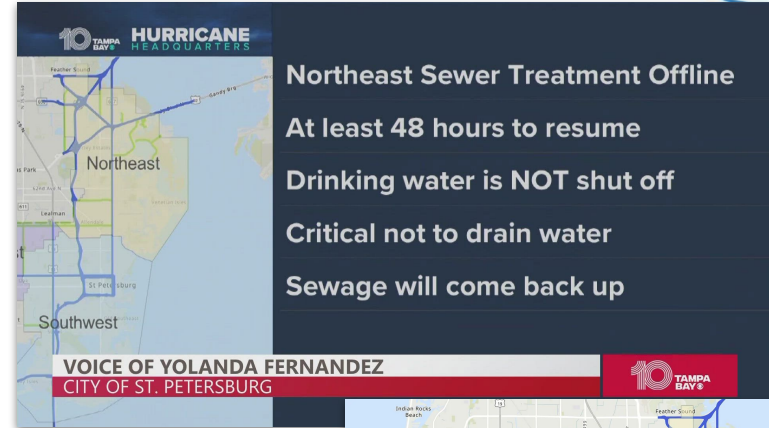


High-water marks on
NEWRF Ops Building after
Helene

Hurricane Helene - St. Pete Impacts

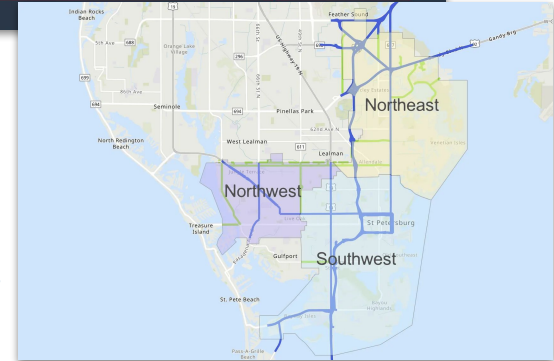


- Major issues in communicating impacts of plant shutdown to residents.
- Use of jargon (“Water Reclamation Facility,” “Lift Station”) didn’t help.
- PIO/Marketing didn’t have clear lines to news outlets to correct reporting errors



Clarified public messaging after initial missteps

Publicly-available maps weren't detailed enough



Hurricane Helene - St. Pete Response



- Response efforts focused on returning plant to service and dealing with the sewage overflows.
- The same crew that evacuated the wastewater facility in the middle of the night returned at first light to assess damages and make repairs.
- Plant was up and running again in 12 hours. (Cannot overemphasize how incredible that is.)

Public notices for unauthorized discharges after Milton



The NEWRF team with St. Petersburg Mayor Ken Welch

Hurricane Helene - St. Pete Response



- Potable water in St. Pete was not impacted, so we sent our crews to the County as mutual aid.
- The daily calls made it simple for the County to tell us what they needed, and we had the crews prepping as we handled EOC paperwork.



Hurricane Helene - St. Pete Response



- Outreach and communication to residents was key.
- WRD dispatch line saw unprecedented call volume.
- Set up dedicated line on the fly for residents to see if they were impacted by the plant shutdown.



Lessons Learned: Hurricane Helene



PCU

- Be CLEAR in what you are asking (ie people, stuff)
- The water can ALWAYS turn off
- Build a bench behind EVERY position
- The trees that withstand the storms are the ones that bend in the wind
- Call in the cavalry when you need them
- Look for the stars in your staff

St. Pete

- Knowing what other utilities were dealing with helped us keep things in perspective for leadership.
- Constant communication facilitated swift deployment of mutual aid.
- Working with other local utilities to develop similar criteria for future evacuations - all work from the same playbook.
- Communications - keep it in layman's terms, be clear, let people know how updates will be issued.

Hurricane Milton - PCU Impacts



- 143/300 Lift Stations lost power
- Boil Water Notice issued because booster station went out again
- 780 work orders
- Trees pulled up pipes



Hurricane Milton - PCU Response



- Staff were TIRED
- The storm was CLOSER to home for many staff
- It was a wind not a water event
- Trees pulled up pipes, trees on power lines, who do you call first?
- More widespread than in Helene
- Resources were already strapped and then we needed even more



Hurricane Milton - St. Pete Impact



- Evacuated two wastewater plants using new evac protocol.
- Lost pressure in the potable system due to line breaks and issued a Boil Water Notice.
- Lost our raw water supply from TBW; St. Pete shut down all potable water service for the first time ever.
- Water maintenance crews were out before first light, among the City's earliest first responders.

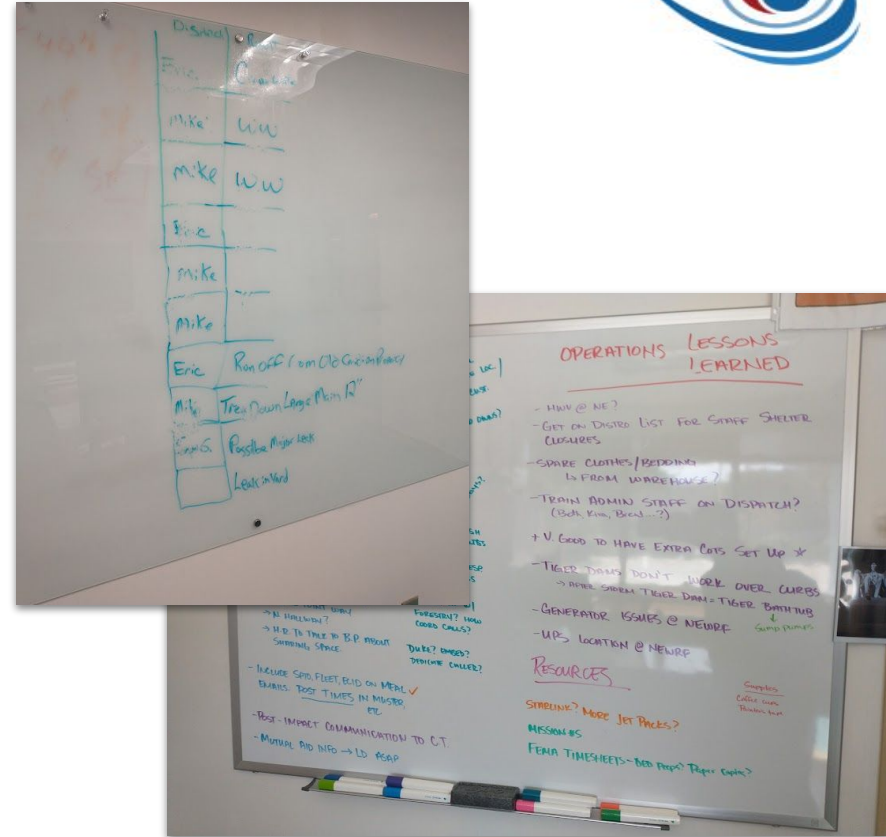


Suspect #1 for the water main break
(Image via Mike's Weather Page)

Hurricane Milton - St. Pete Impact



- City facilities lost internet (including server access), landlines, and cell service just before dawn.
- Response triage had to be coordinated with two radios, a paper map, a whiteboard, and a stack of index cards.



TLDR; Everything was broken



Hurricane Milton - St. Pete Response



- Lack of comms had huge image on initial response - difficult to coordinate with Duke power, Forestry, or to identify duplicate calls.
- No storm surge meant wastewater plants back online quickly.
- City-wide effort launched to locate water line break - police, sheriff's helicopter, billing meter readers, etc.



Contractors dealing with downed power lines

-



Lessons Learned - Hurricane Milton



PCU

- Know your limits and your staff limits
- Keeping records of what happened on a day to day is SUPER IMPORTANT
- Meet people where they are
- Benches aren't just for sitting
- The Calvary is going to save you, let them

St. Pete

- Connection w/ other utilities during response was key - resource and knowledge sharing.
- Have paper back ups of all your forms.
- Intra-departmental collaboration - FD, PD, Billing, all pitched in on leak hunting.
- Don't just need boots on ground, admin support was vital in response and recovery.
- Know *who* to call before you have to call.
- Coordinate with key utilities - forestry, electric, gas - and know how to reach them and what info they need to respond.

What Recovery Looks Like to Utilities



- It's On Going
- FEMA Site Visits are important and utilities should be prioritized
- Finding money for replacing pipes is HARD
- Utilities is a HARD sell because it's hard to see what is being done



Not an exciting photo op



Lessons Learned



- Be specific in what you want
- Start the conversations NOW
- Understanding what will be needed from your staff and partners
- Coordinating with power companies
- Make sure your voice is powerful enough to make decisions



Lessons Learned - from BOTH Storms



- Start writing communication plans NOW
- Need a better WebEOC training and understanding
- Turkey sandwiches are only satisfy staff for so long
- Layman's communication terms are important when shutting down facilities - Figure out a way to show vs. tell to your citizens



Lessons Learned - from BOTH Storms



- GIS is your friend
- BE PREPARED TO PIVOT
- Have a planning section in your UOC
- Public Education regarding what a day without water and sewage is
- Don't forget to educate up as well as out



Lessons Learned- from BOTH Storms



- Trust your gut
- Every system has a capacity
- Have an evacuation plan and a go no-go point for your facilities
- Mental Wellness is Important
- Don't say "my staff won't use/do that..."



Looking to the Future



- Mitigation measures
- Prioritizing power outages
- Knowing who services what
- Cross Training with the municipalities
- Continuing the Municipality Group Meetings
- Expanding to meet with other County utilities providers



Looking to the Future



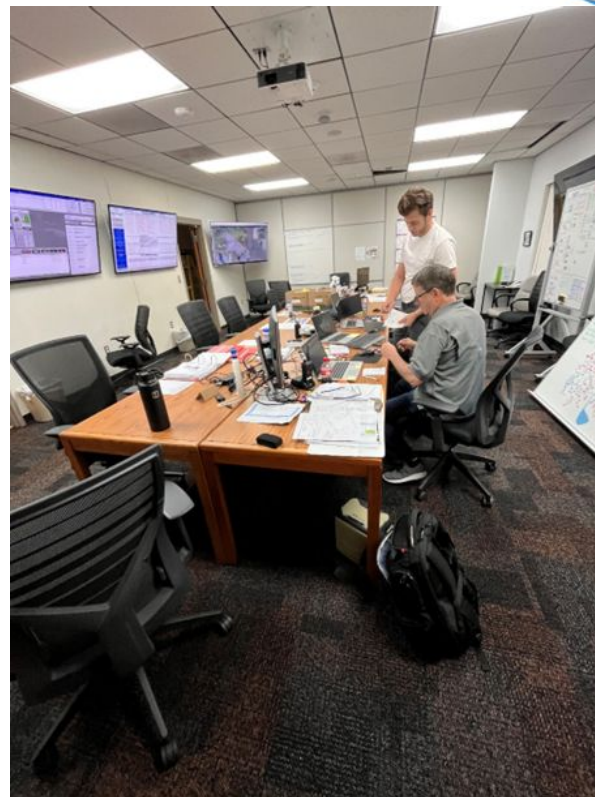
- Better collaboration within county and municipalities
- Creating GIS features to communicate to citizens
- Office hours with staff - You don't know what you don't know



Building & Maintaining Relationships with Utilities



- Start these conversations NOW
- Working WITH instead of Talking AT
- Provide your critical infrastructure so they know where to start
 - Everything can't be the first priority, so make a ranked list of sites to focus on during restoration (Utility facilities, hospitals, shelters, etc.).



Building & Maintaining Relationships with Utilities



- Encourage your Utilities to have an EM representative
- Give utilities a seat at the table
 - We know what the priorities are and how long repairs will take.
 -
- Figure out how you are going to shelter these staff if they don't have a strong enough building



Building & Maintaining Relationships with Utilities



- Communicate how to integrate EM and ICS into Utilities Emergency Operations
- Take the time to tour the facilities and meet the people
- Remember: Utilities have a pulse on the community through their customers



Questions? Comments? Concerns?





Contact Information

Alex Boswell

aboswell@pinellas.gov

404-375-5368



Beth Grimaldi

beth.grimaldi@stpete.org

727-892-5394



Callie Herold

cherold@pinellas.gov

727-433-5396

