

Enhancing Disaster Preparedness and Response in Florida's Water Sector

Kevin Carter | Former Assistant Director of Waste &
Wastewater Services - Broward County, FL
Susanna Pho, CFM | COO & Co-founder - Forerunner



Housekeeping

- This presentation is being **recorded**.
- The **recording will be shared** via email after the webinar.
- If you have a question, please **post it in the Q&A**.
- Toward the end of the webinar, **complete the attendance survey** to receive your 1 ASFPM CEC and .10 ICC CEU. *The certificates will be sent via email to you next week, and your attendance will be shared with ASFPM and ICC.*
- **Please reach out** after the webinar for additional questions.



Poll

- 1 Introduction
- 2 Enhancing Disaster Preparedness
- 3 Q&A

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We work with over 190 cities, counties, and states across the U.S.



FDEM
Florida



DWR
California



MEMA
Mississippi



BOI
Maine



Harris County
Texas



Nashville
Tennessee



Corpus Christi
Texas



Palm Beach County
Florida



Miami
Florida



Chatham County
Georgia



Cedar Rapids
Iowa



Raleigh
North Carolina



Lee County
Florida



Lincoln
Nebraska



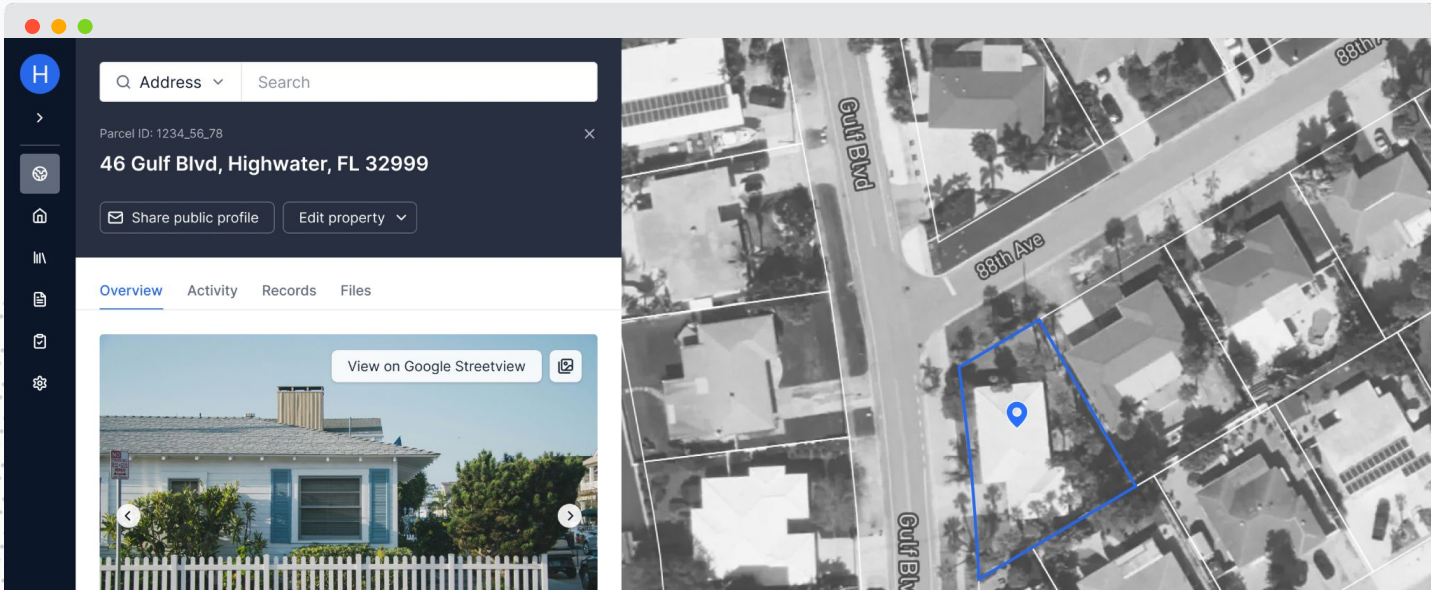
Tampa
Florida



Chattanooga
Tennessee

Our solution

Forerunner empowers gov. agencies to do more.



The AI-powered intelligence layer for government operations.



AI Intelligence.

Get instant answers to operational questions, surface risks before they escalate, and cut time you spend on documentation.



Field Workflows.

Give your field crews tools that guide them through every inspection — so data quality doesn't depend on experience level.



Automations.

Stop chasing follow-through manually. Tasks are routed to the right crews automatically, and your systems stay up to date.



Integrations.

We connect to the systems you already use — no rip and replace. You're up and running fast, and your existing investments keep working.

Connect your existing systems — without starting from scratch.

- Works with the systems you already have — GIS platforms, permitting tools, and more
- Send data into Forerunner or push it out to other systems, in both directions
- Custom integrations available where you need them
- Most partner communities get API access included — no added cost to get connected



Accela

Permitting, licensing, and inspections for government agencies



Citizenserve

Community development software for local government workflows

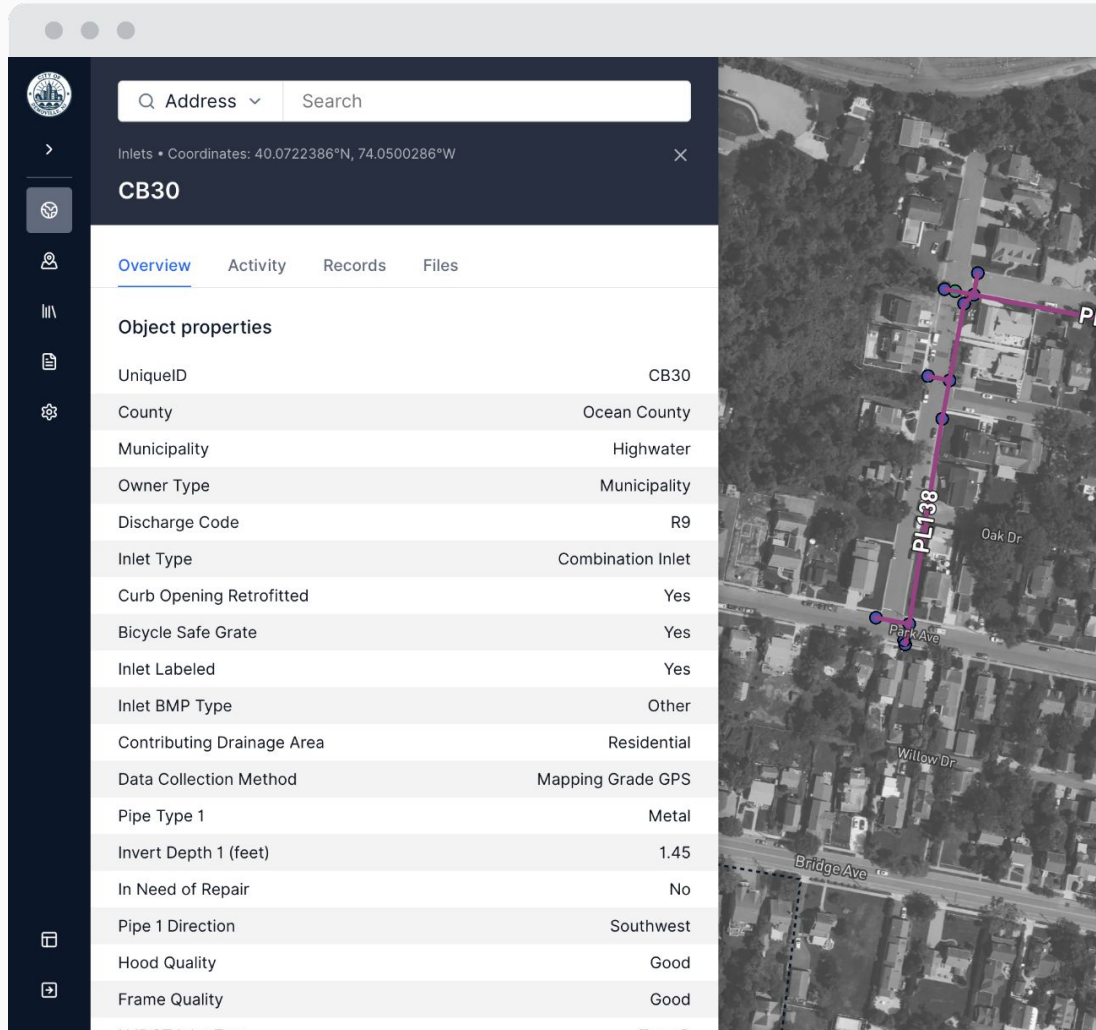


ArcGIS

Esri's platform for mapping, spatial analysis, and location intelligence

When your teams work from the same information, better outcomes follow.

- Real-time, shared information — no more siloed systems or stale reports
- Automated workflows replace manual handoffs and follow-up
- Field observations captured accurately and synced back to your systems
- Leadership gets the visibility to prove impact and reduce risk



Address Search

Inlets • Coordinates: 40.0722386°N, 74.0500286°W

CB30

Overview Activity Records Files

Object properties

UniquelD	CB30
County	Ocean County
Municipality	Highwater
Owner Type	Municipality
Discharge Code	R9
Inlet Type	Combination Inlet
Curb Opening Retrofitted	Yes
Bicycle Safe Gate	Yes
Inlet Labeled	Yes
Inlet BMP Type	Other
Contributing Drainage Area	Residential
Data Collection Method	Mapping Grade GPS
Pipe Type 1	Metal
Invert Depth 1 (feet)	1.45
In Need of Repair	No
Pipe 1 Direction	Southwest
Hood Quality	Good
Frame Quality	Good

Map view showing the asset location on a street (Park Ave) with a purple line and markers. Other streets visible include Oak Dr, Willow Dr, and Bridge Ave.

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- 2 Enhancing Disaster Preparedness
- 3 Q&A



Kevin Carter

Former Assistant Director of Water & Wastewater
Services
Broward County, FL

Enhancing Disaster Preparedness and Response in Florida's Water Sector

Thursday, April 23, 2026

Forerunner Strategic Sessions Webinar Series

Kevin Carter

Past FlaWARN Steering Committee Chair

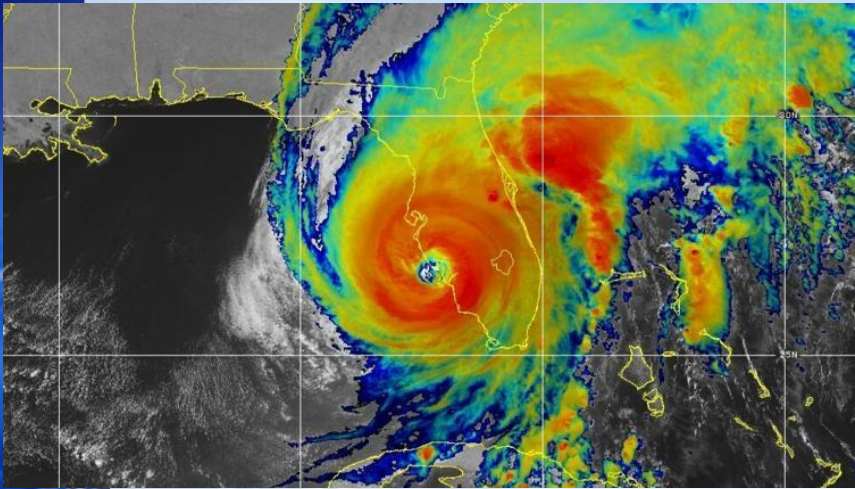
carterH2O954@gmail.com

954-295-4948 mobile

- Thank you Forerunner for giving me this opportunity to talk about Florida's Water Heroes who respond to emergencies at moment's notice.
- Beyond speaking about one of my favorite topics, this represents an opportunity to bridge water silos and learn from each other.
- I consider this a start of a conversation that will continue to strengthen all water sectors in their emergency preparedness and response.



THANK YOU

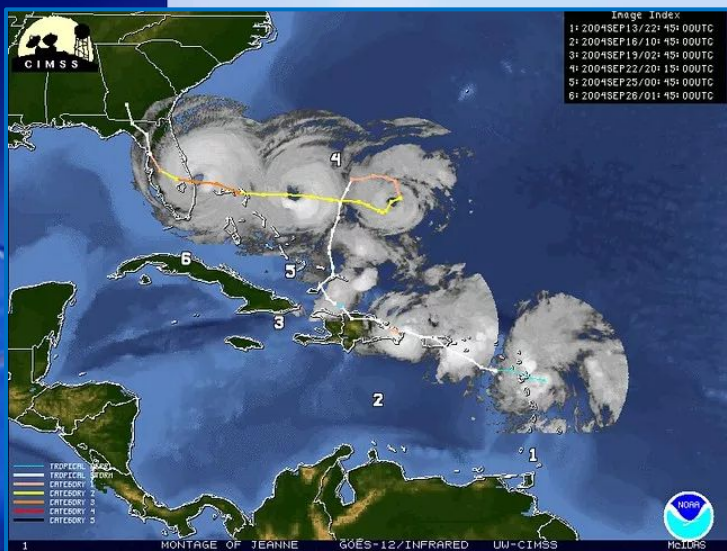


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How do Florida's Water and Wastewater Utilities respond to emergencies?

- The Florida Water/Wastewater Agency Response Network (FlaWARN) is the primary way water sector responds to emergencies.
- When part of the state is impacted, other areas in state respond with aid, “Utilities helping Utilities, Friends helping Friends.”
- Created in April 2005 as a result of the devastating impact that Hurricanes Charlie, Frances, Jeanne, and Ivan had in 2004.
- Ironically, four more hurricanes hit Florida in 2005!



Hurricane Jeanne's track in 2004

<https://www.nesdis.noaa.gov/news/the-2004-atlantic-hurricane-season-look-back-above>

FlaWARN's recent history



- 2016 Hurricane Matthew
- 2017 Hurricane Irma
- 2018 Hurricane Michael
- 2020 and following years COVID Global Supply Chain Issues
- 2022 Hurricane Ian
- April 2023 Rain Bomb event in Fort Lauderdale, 26-inch rain event in 24 hours, 23 inches in first 4 hours and during rush hour
- 2023 Hurricane Idalia
- 2024 Hurricane Debby, Helen, and Milton
- 3rd Party pipe damages under blue skies

What is FlaWARN?



<https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Wastewater-Agency-Response-Network>

- Formalized mutual aid response network/consortium of utilities willing to provide critical resources to member utilities during human-made or natural disasters
- Part of a National WARN Network.
- Open to all water and wastewater utilities.
- Designed to help protect public health and the environment.
- Not a corporation or government entity.

Slide adapted from Andy Campbell's (FlaWARN Administrator) slides from FSAWWA Conference (November 2022)

FlaWARN's Purpose



- ❑ Coordinate initial communication between member utilities to ensure the responding utility sends the appropriate resources to both assess and assist the impacted utility.
- ❑ Create events in WATER Tracker (online software platform) to facilitate the free flow of information during a crisis.
- ❑ Coordinate with State Emergency Operations Center (EOC, especially Florida Department of Environmental Protection) and Federal Agencies to provide additional resources as available.
- ❑ Coordinate with local EOCs.
- ❑ Coordinate with national WARN system.

The City of Pompano Beach Hurricane Ian response team onsite and bringing back water to the community.

Slide adapted from Andy Campbell's (FlaWARN Administrator) slides from FSAWWA Conference (November 2022)

Mutual Aid Agreements (MAAs):



The Miami-Dade County Hurricane Ian response team ready to roll!

- Mutual aid agreements establish the terms under which assistance is provided between utilities:
 - Designates points of contacts with authority to provide crisis response.
 - Provides procedures for matching resources to meet the requesting utilities' needs.
 - Delineates span of control for supervision of personnel and equipment as part of the Incident Command System (ICS).
 - Reimbursement provisions – Federal Emergency Management Agency (FEMA) standard or otherwise agreed upon rates.
 - Liability and worker's compensation provisions.

Mutual Aid Agreements (MAAs, cont.):

PLEASE DON'T LET THIS BE
YOUR MAA SIGNING
CEREMONY LOCATION!



MUTUAL AID AGREEMENT FOR WATER/WASTEWATER

ARTICLE I. PURPOSE

The Water/Wastewater Mutual Aid Program was established to provide a method whereby water/wastewater utilities sustaining physical damage from natural or man made disasters could obtain emergency assistance, in the form of personnel, equipment, and materials and other associated services necessary, from other water/wastewater utilities. The purpose of this Agreement is to formally document such program.

Please ...
SIGN HERE

- ❑ Signing a MAA on the bed of a pickup truck at midnight is not the optimal process.
- ❑ FlaWARN currently on MAA Outreach Campaign.

How does FlaWARN Operate During an Event?



- ❑ The Steering Committee is the Unified Command within the Incident Command System and begins meeting twice daily 2 to 3 days before landfall.
- ❑ Post storm, affected utilities perform damage assessments.
- ❑ Through WATER Tracker as well as local and state Emergency Operations Centers, utilities request resources and Steering Committee to determine how to best meet needs.
- ❑ Typically deploy utilities in closest proximity, however during large storms utilize entire state and even other states.
- ❑ Coordination through the Steering Committee is critical to not duplicate efforts, send wrong resources, or respond slowly.

WATER Tracker Software



Hello Kevin Carter! Welcome to Florida's WATER Tracker

[Go Mobile](#)



Find a Facility



Update Status



Offer Help



Get Help NOW!!

News

There Are No Active News Items

Event Updates

No current event: No event related news at this time.

No current event

[Counties Affected Map](#)

[Counties Affected Data](#)



Needs

Can you help? Facilities/Organizations need the following:

Show Only Selected County:

Show 10 entries

Toggle	Files	Select	Facility ID*	Fac/Org/UG Name	Needs	Number
No data available in table						

Showing 0 to 0 of 0 entries

[Provide Resources](#)

[Previous](#)

[Next](#)

Statewide Active Boil Water Notices: 13



- The WATER Tracker Software is critical to know what resources are needed and who can meet the need.
- Funded and administered by our Florida Department of Environmental Protection (FDEP).
- Evolved from two separate FDEP and FlaWARN databases.
- Used in dark and blue skies (e.g., boil water notices due to water pressure drop).
- Now a national model for WARNs.

WATER Tracker Software (cont.)



Needs for a Date Range - Needs Summary

Needed Description	Needed By	Needed	Facility Needed
Bypass/Trash Pump		12	
	6411098 - TOWN OF LONGBOAT KEY		4
	6521405 - PINELLAS COUNTY UTILITIES		2
	FL0021326 - Dunedin City of AWWTF		1
	FL0031216 - Cedar Key WRF		3
	FLA011658 - Greenville WWTF		1
	FLA116572 - Madison WWTF		1
Collection System Operator		1	
	FLA011824 - Steinhathee WWTF No.1		1
Control Panels		2	
	FL0031216 - Cedar Key WRF		2
Distribution system operator		11	
	2621102 - BIG BEND WATER AUTHORITY		1
	6521405 - PINELLAS COUNTY UTILITIES		10
Electrician		1	
	2151140 - SUWANNEE WATER & SEWER DISTRICT		1
Fuel		1	
	FLA011824 - Steinhathee WWTF No.1		1
Generator		8	
	1330478 - MONTICELLO, CITY OF		1
	2124284 - WOODGATE VILLAGE		1
	2124338 - SUNDIAL APARTMENTS		1
	2124409 - LANCE WATER		1
	2400185 - CHERRY LAKE UTILITIES		1
	2401296 - LEE WTP		1
	2624165 - TAYLOR COASTAL WATER & SEWER DISTRICT		1
	FL0027839 - Monticello, City of - WWTP		1

- Example of resource needs requests from utilities impacted by emergency.
- Resources include equipment, parts, vehicles, and most importantly people!

WATER Tracker Software (cont.)



Needs for a Date Range - Resources Summary			
Provided Description	Provided By	Provided	Facility Provided
Bypass/Trash Pump		12	
	3490751 - TOHO WATER AUTHORITY EASTERN		2
	5360025 - BONITA SPRINGS UTILITIES		4
	Organization - Florida Rural Water Association		5
	Utility Group - US Water Services Corporation		1
Collection System Operator		1	
	FLA010251 - Sandestin WWTP		1
Control Panels		2	
	Organization - Florida Rural Water Association		2
Distribution system operator		11	
	1660596 - REGIONAL UTILITIES WATER SYSTEM		1
	3490751 - TOHO WATER AUTHORITY EASTERN		10
Electrician		1	
	Organization - Florida Rural Water Association		1
Fuel		1	
	Organization - Florida Rural Water Association		1
Generator		8	
	Organization - Florida Rural Water Association		8
Other Equipment		12	
	3490751 - TOHO WATER AUTHORITY EASTERN		2
	5360025 - BONITA SPRINGS UTILITIES		9
	Organization - Florida Rural Water Association		1
Other Labor		14	
	5360025 - BONITA SPRINGS UTILITIES		4
	Organization - FlaWARN Steering Committee		10

□ Example of resources made available by potentially responding utilities.

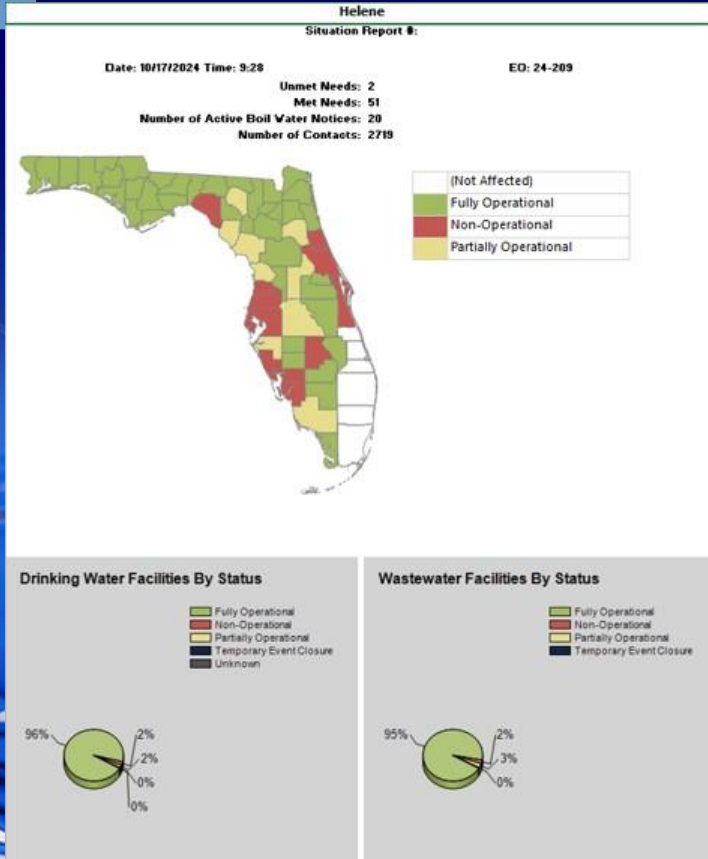
WATER Tracker Software (cont.)



□ Example of resources needs and available resources report.

6511495	PINELLAS COUNTY UTILITIES	Bypass/Trash Pump	9/29/2024 17:10:01 EDT	Helene	Steve Soltou	2	2		Mission #102979: Bypass pumps (2) with two 4" female flange.	Nataliy Hatzack (813) 957-6633 nhatzack@pinellascountys.org											
Assignment Notes									Provided	Provided By	Provided By Name	Details	Point of Contact	Date Deployed	Date Received	Date Released	Date Returned	Org. Assigned By	Org. Assigned Date		
								1	3F90751	TOHO WATER AUTHORITY EASTERN	Responding to Mission #102979	Jancarlos Rodriguez (407) 385-9990 (Mobile) jcaro@tohowater.com					10/9/2024	Katherine Ison-Zant	10/1/2024 11:13 EDT		
								1	3F90751	TOHO WATER AUTHORITY EASTERN	Responding to Mission #102979	Jancarlos Rodriguez (407) 385-9990 (Mobile) jcaro@tohowater.com					10/9/2024	Katherine Ison-Zant	10/1/2024 11:13 EDT		
6511495	PINELLAS COUNTY UTILITIES	Distribution system operator	9/28/2024 08:25:41 EDT	Helene	Steve Soltou	10	10		(see mission #102183. Requesting 3 to 4 field support crew (10 to 12 people total) to identify and repair potable water service line and main leaks. Location: 6730 142nd Ave. N, Largo, FL	Steve Soltou (727) 272-0374 soltou55@gmail.com											
Assignment Notes									Provided	Provided By	Provided By Name	Details	Point of Contact	Date Deployed	Date Received	Date Released	Date Returned	Org. Assigned By	Org. Assigned Date		
								10	3F90751	TOHO WATER AUTHORITY EASTERN		Dyana Stewart (904) 856-8077 (Mobile) dyana@fwu.net						10/2/2024	Dyana Stewart	9/29/2024 14:37 EDT	
6511495	PINELLAS COUNTY UTILITIES	Other Labor	9/28/2024 08:14:01 EDT	Helene	Steve Soltou	10	10		(please see mission #102152) Request 10 individuals to perform water disconnections at the public meter at addresses in heavily impacted areas. Meters are being disconnected in the attempt to raise the systems water pressure, leaks on the consumer side of the meters is causing a loss in system pressure. Maps and work routes will be provided. Individuals will work from 7am-7pm until the project is completed, thousands of meters need to be disconnected. Transportation is not provided. Will require PPE for working outside for 12 hours: Gloves Long pants, Long or short sleeve work shirts Hi-vis safety vests Appropriate foot wear. Record Mutual Aid Details Delivery Details Each individual will need a shovel.	Steve Soltou (727) 272-0374 soltou55@gmail.com											
Assignment Notes									Provided	Provided By	Provided By Name	Details	Point of Contact	Date Deployed	Date Received	Date Released	Date Returned	Org. Assigned By	Org. Assigned Date		
								10	Organization	FlaWARN Steering Committee	Garner Assets responding to Mission 102152	Dyana Stewart (904) 856-8077 (Mobile) dyana@fwu.net						10/9/2024	Dyana Stewart	9/30/2024 14:59 EDT	

WATER Tracker Software (cont.)



- Example of Daily Situation Reports on Operational Status Developed by Florida Department of Environmental Protection (DEP).
- During the three hurricanes of 2024, DEP deployed numerous personnel in the field to help determine operational status.



Hurricane Milton Landfall 10/09/25, 8:30 p.m. at Siesta Key



Hurricane Milton: Watch the Track



Hurricane Milton
 Tuesday October 08, 2024
 7 AM CDT Intermediate Advisory 13A
 NWS National Hurricane Center

Current information: ● Tropical Cyclone
 Center location 22.5 N 88.8 W
 Maximum sustained wind 145 mph
 Movement ENE at 12 mph

Forecast positions: ○ Post/Potential TC
 Sustained winds: D < 39 mph
 S 39-73 mph H 74-110 mph M > 110 mph

Potential track area:
 Day 1-3 Day 4-5

Watches:
 Hurricane Tropical Storm

Warnings:
 Hurricane Tropical Storm



Hurricane Milton
 Wednesday October 09, 2024
 8 PM EDT Intermediate Advisory 19A
 NWS National Hurricane Center

Current information: ● Tropical Cyclone
 Center location 27.2 N 82.8 W
 Maximum sustained wind 120 mph
 Movement ENE at 15 mph

Forecast positions: ○ Post/Potential TC
 Sustained winds: D < 39 mph
 S 39-73 mph H 74-110 mph M > 110 mph

Potential track area:
 Day 1-3 Day 4-5

Watches:
 Hurricane Tropical Storm

Warnings:
 Hurricane Tropical Storm

Hurricane Milton Devastation



St. Petersburg

St. Petersburg Beach



Siesta Key

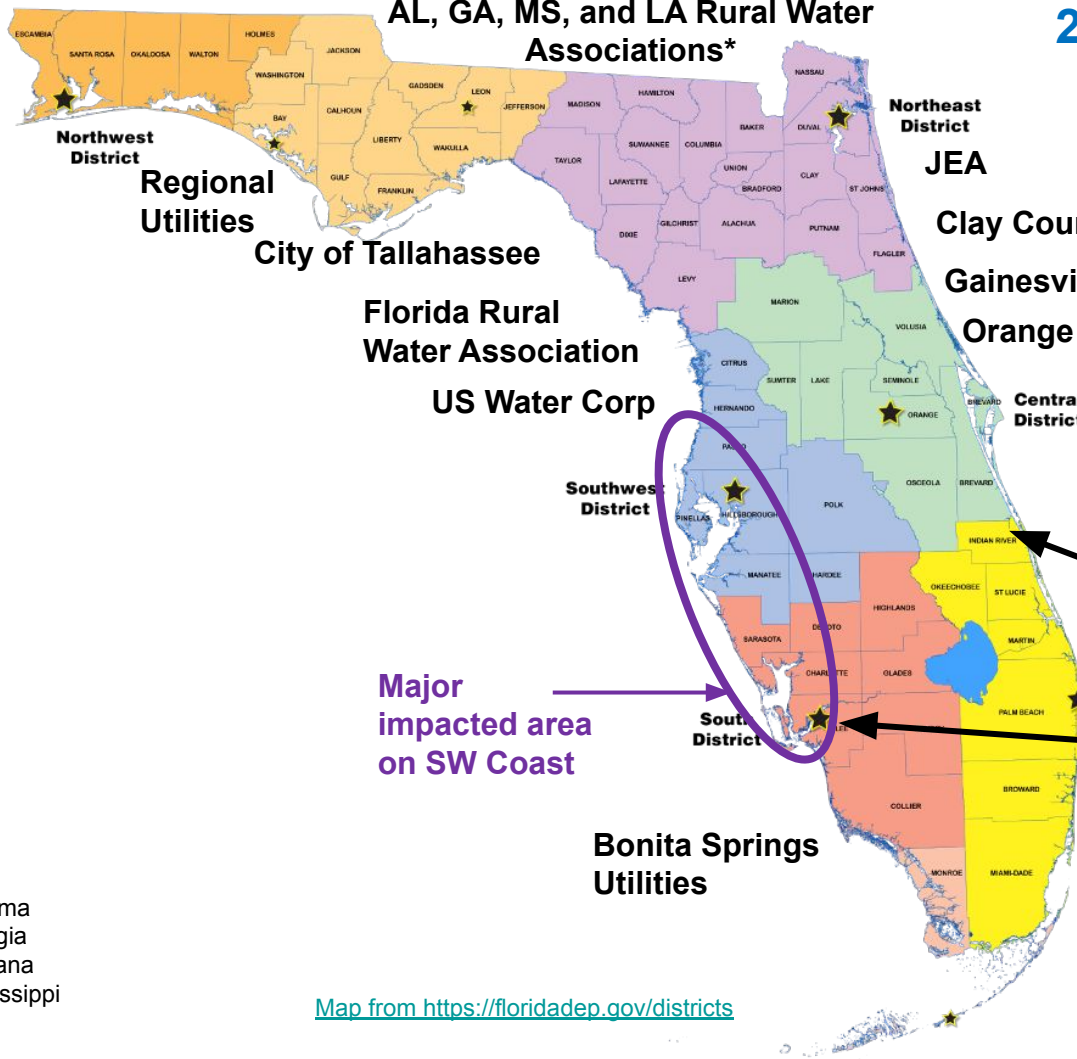


St. Petersburg

Tampa



2024 Hurricane Ian Milton Responding Utilities; Over 100 personnel!



Northwest District

Regional Utilities

City of Tallahassee

Florida Rural Water Association

US Water Corp

Southwest District

Major impacted area on SW Coast

South District

Bonita Springs Utilities

Northeast District

JEA

Clay County Utility Authority

Gainesville Regional Utilities

Orange County

Toho Water Authority

Central District

Palm Beach County

Southeast District

City of Boynton Beach

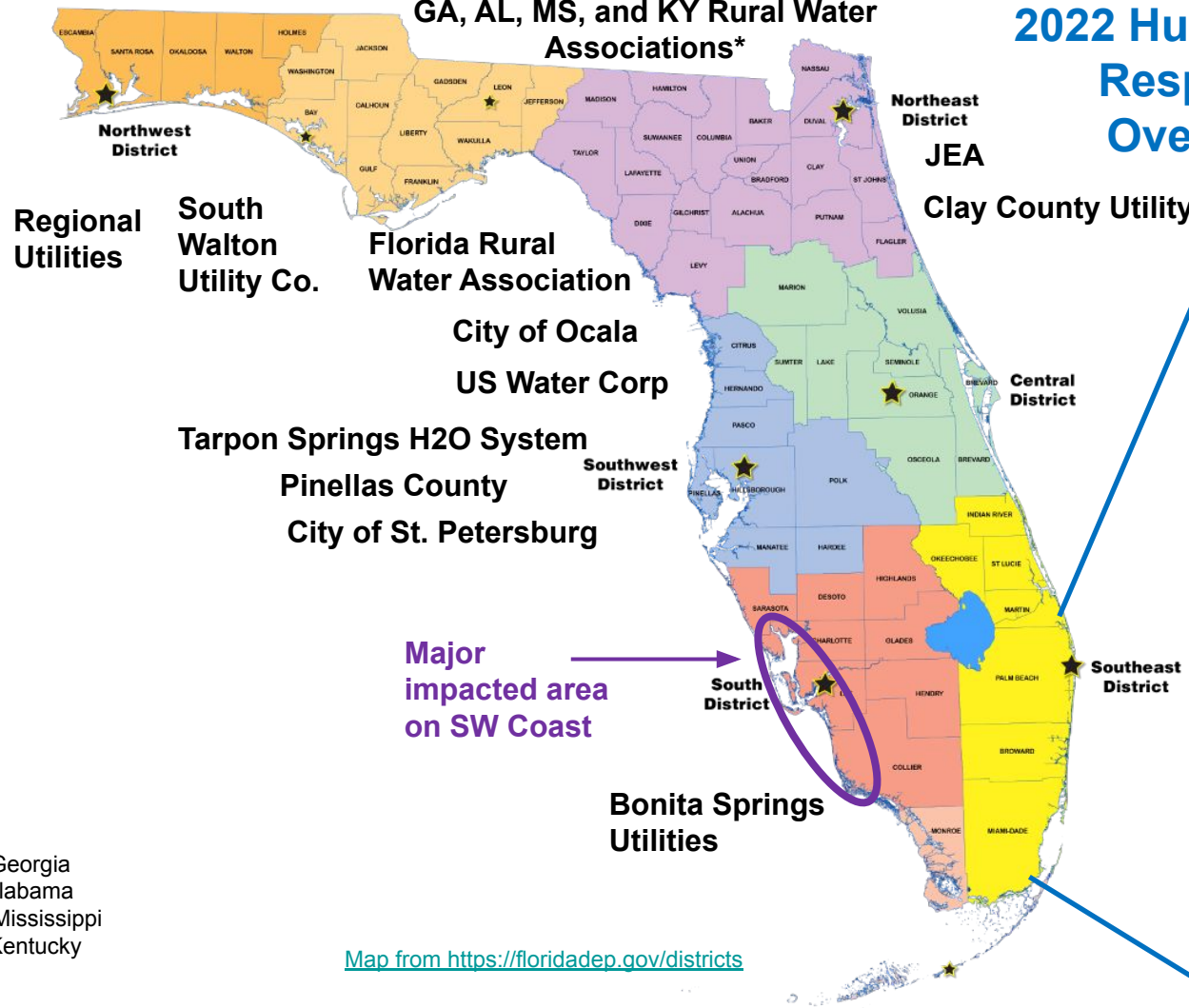
City of Margate

*
AL = Alabama
GA = Georgia
LA = Louisiana
MS = Mississippi

Map from <https://floridadep.gov/districts>

2022 Hurricane Ian FlaWARN Responding Utilities; Over 300 personnel!

GA, AL, MS, and KY Rural Water Associations*



Regional Utilities

South Walton Utility Co.

Florida Rural Water Association

City of Ocala

US Water Corp

Tarpon Springs H2O System

Pinellas County

City of St. Petersburg

Major impacted area on SW Coast

Bonita Springs Utilities

**Northeast District
JEA**

Clay County Utility Authority

Central District

South District

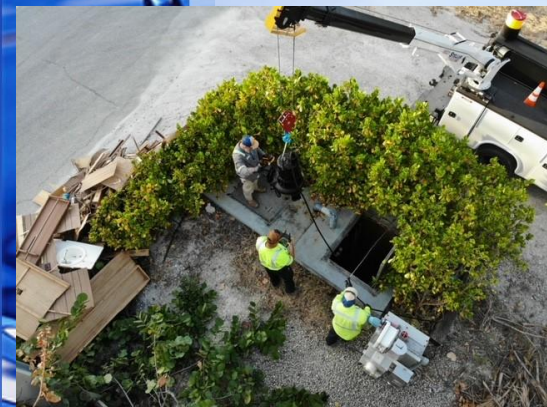
Southeast District

- Seacoast Utility Authority
- Loxahatchee River District
- Town of Jupiter
- City of West Palm Beach
- Palm Beach County
- City of Lake Worth Beach
- City of Boynton Beach
- City of Boca Raton
- City of Deerfield Beach
- Broward County
- City of Pompano Beach
- City of North Lauderdale
- City of Oakland Park
- City of Plantation
- City of Hallandale Beach
- Miami-Dade County

*
GA = Georgia
AL = Alabama
MS = Mississippi
KY = Kentucky

Map from <https://floridadep.gov/districts>

Post Hurricanes, FlaWARN's Water Heroes Helping Florida Communities Bring Back Life's Most Important Resource – Water!



FlaWARN: Areas of growth



US Army Corps Generators headed to Guam after Typhoon Mawar

- Are there ways to optimize personnel and/or resource deployment among FlaWARN utilities?
 - Potential to share rental hauling vehicles.
 - Potential for strike team development.
 - More outreach to non FlaWARN members and utilities with no MAAs.
 - More outreach to Emergency Managers and other water sectors (e.g., stormwater).
 - More WATER Tracker training.
 - More Regional and Local Exercises.
 - Planning to receive aid.

FlaWARN: Areas of growth (cont.)



Miami-Dade County New Chlorine Building Elevation Based on Hurricane Flood Surge Modeling.

- Are there ways to optimize personnel and/or resource deployment among FlaWARN utilities (cont.)?
 - ICS training and education opportunities.
 - Newer Technology (e.g., Drones and GIS layers).
 - AI modeling of stormwater levels and adaptation strategies
(https://www.floridawca.org/wp-content/uploads/2025/07/20250620_Torres_OCU-Real-Time-Flood-Forecasting.pdf).
 - Resiliency adaptation – Heightening and Hardening.
 - International aid (e.g., Operators Without Borders need in Bahamas post Hurricane Dorian).

OWB Chair and
Founder
Valerie Jenkinson
addressing SEFLUC
March 2020



- **Objective: To assist water and wastewater utilities in developing countries recover from disaster situations and build capacity through training and mentoring water and wastewater operators and other professionals.**

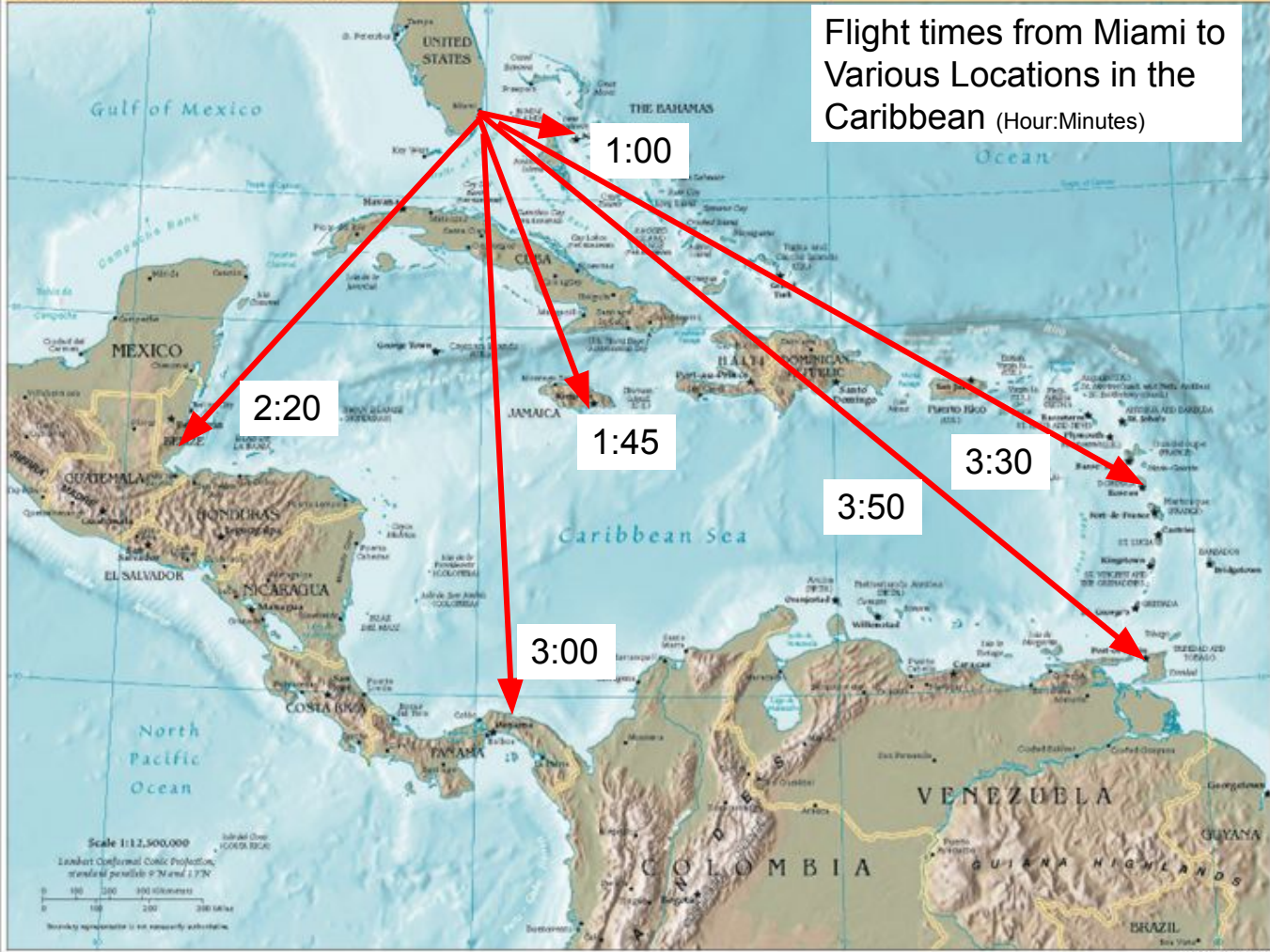


- Began in the Caribbean now working globally:
 - Europe – Working with colleagues to assist Ukraine
 - Africa – 4 countries
 - South America – Incident Command System (ICS) Training
 - Caribbean – ICS and Water Professionals International
 - Australia – Newest Board member

<https://www.linkedin.com/company/operators-wi-thout-borders/>



Flight times from Miami to Various Locations in the Caribbean (Hour:Minutes)



Why Florida and the Caribbean and Latin America?

**Location!
Location!
Location!**

Miami-Dade Fire Rescue Florida Task Force 1 being sent to Puerto Rico

Author: [CBSMiami](#)

Published: August 27, 2019 Updated: August 27, 2019



Task force returns home from giving helping hand in Fort Myers

Miami-Dade Fire Rescue calls mission a success of time spent in Hurricane Ian hit area

Roy Ramos, Reporter Published: October 11, 2022 at 6:47 PM [Miami Local 10 News](#)

LOCAL NEWS: Miami-Dade's Task Force One ready to help in earthquake's aftermath (Turkey)

BY CBS MIAMI TEAM FEBRUARY 6, 2023 / 11:13 PM / CBS MIAMI

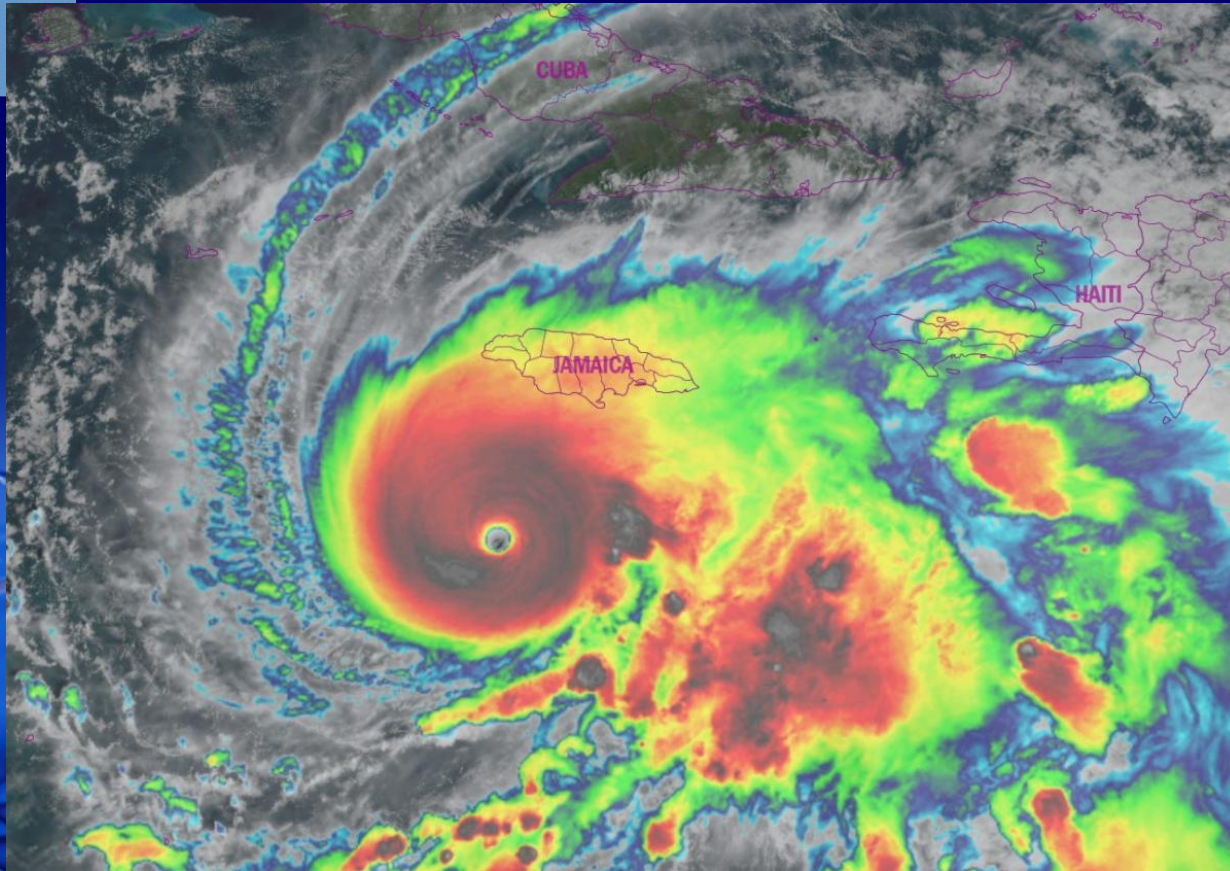
Example of Miami-Dade County Deployments Hurricanes / Weather Disasters

1988	Gilbert, Jamaica
1989	Hugo, Eastern Caribbean
1992	Andrew, Miami
1995	Luis, Caribbean
1995	Marilyn, Caribbean
1995	Opal, North Florida
2000	Belize
2004	Charley, Charlotte County, Florida
2005	Katrina, New Orleans, Louisiana
2008	Gustav, Texas
2008	Ike, Miami-Dade County, Florida

Why Florida and the Caribbean and Latin America (cont.)?

- Florida Task Force Teams Exist for Search/Rescue, Fire, Medical, and Security Response.
- Why not for water sector?
- Future Homework for the Florida Water Sector.

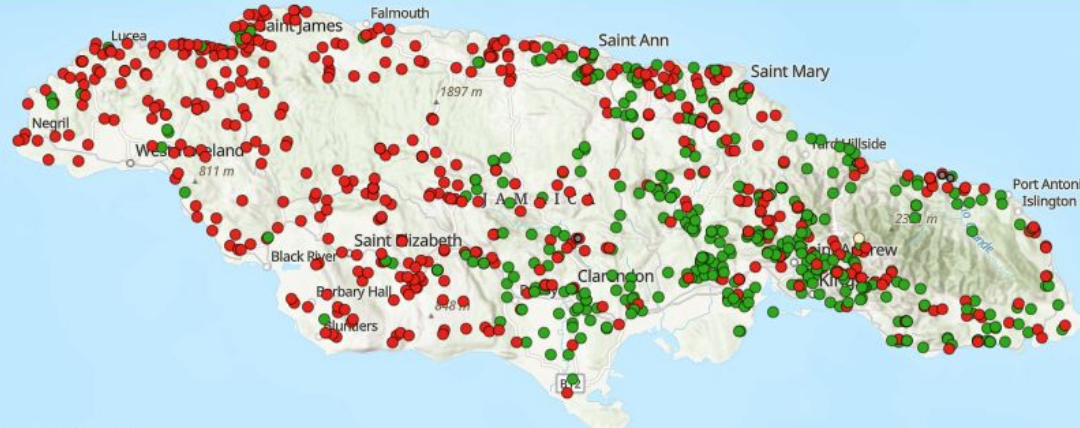
2025 Hurricane Season was looking good and then came Melissa...



- One of the strongest hurricanes with 185 mph winds with a wind gust of 252 mph at an altitude of 657 ft (200 m), being the highest ever recorded.
- Devastated the western portions of Jamaica.
- Fortunately, the heavily populated capital was relatively spared major impacts.

Jamaica National Water Commission Current System Status 6 weeks after Hurricane Melissa

Facilities Update Map



Esri, CGIAR, USGS | Esri, TomTom, Garmin, FAO, METI/NASA, USGS

Powered by Esri

- Due in large part to the storm not impacting Kingston, Jamaica National Water Commission (NWC) did not request personnel.
- However, power outages continue to impact water service especially in western side of island.
- NWC also has resource needs such as dewatering pumps that were not on the island at sufficient quantities.

Challenge 1: Florida Water Sector's Attempt to Send Generators to Jamaica



- Trying to develop, yet alone implement, a new plan during the disaster response is like building a plane while flying.
- Florida utilities well experienced sending resources through FlaWARN but not in international response.
- Homework assignment for us all.

THE SOURCE

NEWSLETTER

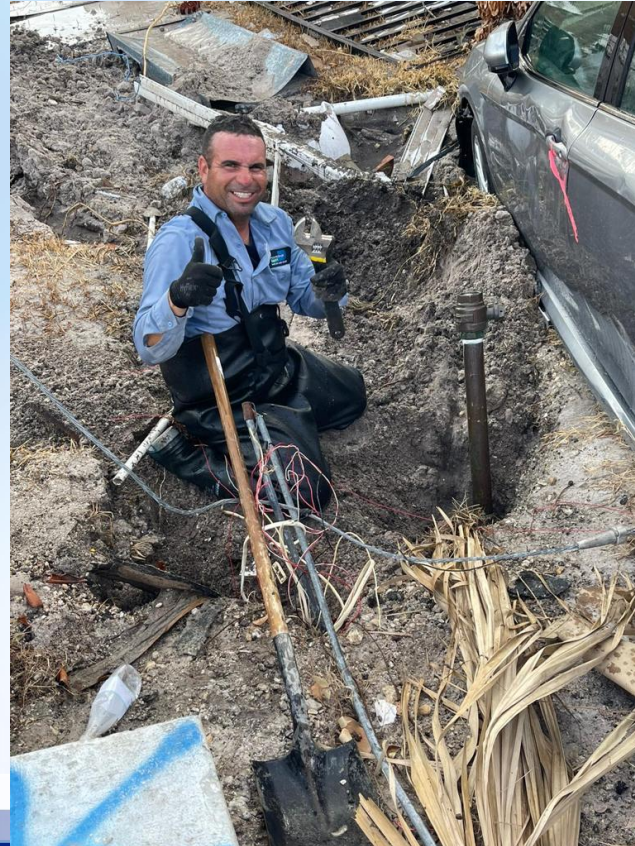


Jamaica Rural Water Supply Limited

- The Jamaica Rural Water Supply Limited ([RWSL](#)) is a government owned engineering company which is primarily involved in the designing, planning and implementation of drinking water infrastructures.
- RWSL constructs drinking water systems and then normally turns them over to a local entity such as a municipal corporation with affiliation with a Jamaican parish.
- For Operators With Borders, I spent two weeks with them primarily in Kingston to coordinate disaster response.
- **Challenge 2: It took 5 to 8 weeks to get rural assessments from western parishes due in large part to lack of access.**

Wherever around the globe this is
the Picture of Success!

FlaWARN



Conversations Lead to Solutions – Let's Talk! Time For Discussion

Ft. Myers Beach shows
their appreciation for
Miami-Dade County
Hurricane Ian response



Kevin Carter
Past FlaWARN Steering Committee Chair
carterH2O954@gmail.com
954-295-4948 mobile

- 1 Introduction
- 2 Enhancing Disaster Preparedness
- 3 Q&A

Thank you!



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susanna@withforerunner.com