

Lake Worth Drainage District, FL

Real-time Stormwater Management Keeps Pace with Mother Nature

Florida's Lake Worth Drainage District (LWDD or District) was created in 1915 specifically for the purposes of reclaiming, draining, and irrigating the lands within its boundary and to provide water control and water supply to support the livelihood of communities along Florida's Atlantic Coast between Fort Lauderdale and West Palm Beach.

Today, LWDD provides comprehensive flood control, water conservation and water supply protection for 13 municipalities serving more than 750,000 residents. As part of its remit, LWDD monitors and controls a complex system of approximately 500 miles of canals, 20 major water control structures and numerous minor structures across over 200 square miles.

The Challenge

The District lacked a system-wide view of the condition of their canal network requiring the staff to be on the road, continually checking the status of the District's infrastructure and attempting to prepare for upcoming events. Often, the process involved driving to a canal staff gauge, reporting the condition, making an operational decision, driving to the control gate to implement the control decision, then driving back to the original point to check the results. It was often a two-hour exercise to implement one decision in an era where events were changing by the minute.

LWDD also lacked an integrated view into the meteorological conditions such as radar and rainfall intensity and real-time level information from adjacent systems upstream and downstream of the District. As a result, operators found themselves continuously in a reactive mode, struggling to react quickly enough to protect their customers.

The Solution

LWDD's vision was to replace the human-centric decision and reaction system, with one based on data, information, and control. The District's solution was to acquire and deploy SmartCover Systems flow monitoring devices using satellite communication to constantly communicate the dynamic conditions within the District's flood control infrastructure. Level sensors feed the SmartCover platform which integrates with NOAA rainfall information, regional radar data and tidal information, and works in conjunction with the District's remote-control SCADA system for gate operation.

This architecture has revolutionized the District's response time, allowing changes in conditions to be monitored in near real-time, while reducing the uncertainty around the conditions in the flood control network. As a result, the District can move more water out of the system faster and lower the probability of flooding and reduce operational response time to minutes as opposed to hours.

Highlights:

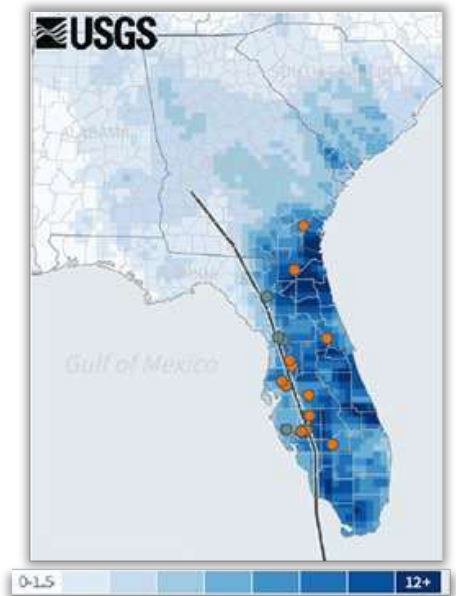
- Implemented 27 remote real-time monitors in canal network
- Integrated NOAA rainfall, regional radar data and tidal information
- Reduced operational response time from hours to minutes
- Improved storm response time and reduced risk of flooding

The Results

The system was put to the test during Hurricane Irma in September 2017. Hurricane Irma was an extremely powerful hurricane, which brought devastating winds and flooding to a large part of the eastern Caribbean and the eastern US seaboard.

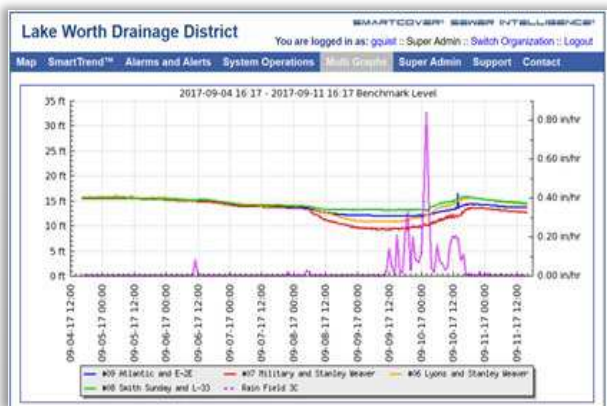
Irma was the strongest storm on record to exist in the open Atlantic region and the combined effect of storm surge and tide produced maximum inundation levels of 4 to 6 ft above ground level for portions of Miami-Dade County in southeastern Florida.

Rainfall Totals, Hurricane Irma 2017 (USGS)



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With the integrated system giving combined visibility on the canal status as well as rainfall intensity and duration, the District was able to predict the performance of its flow control infrastructure, project peak stages and make educated, proactive decisions on managing this historic event. This adaptive stormwater system allowed the District to operate with no interruption in service before, during, or after Irma.



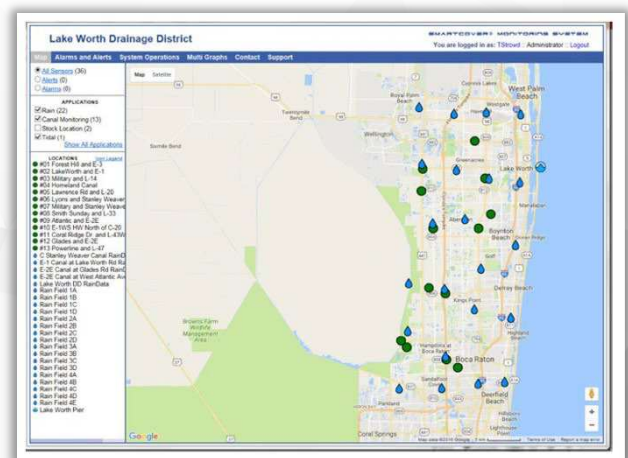
LWDD Operational Dashboard

Conclusion

Using SmartCover's strategic sensor placement processes, the District was able to maximize the impact while minimizing costs, with a 2-year payback simply in reduced manpower costs. That benefit is independent of the operational efficiencies in maximizing the capacity within the District's built infrastructure, reducing the requirement for capital improvements, and preventing property losses.

LWDD has deployed multiple SmartCover sensor units throughout its canal network. The deployment was an immediate economic benefit by reducing the manpower requirements to read staff gauges and respond to events. Real-time information and control have also dramatically reduced overtime costs.

LWDD is realizing additional benefits such as understanding how to prepare flood control networks for upcoming storms; identifying when canal cleaning and maintenance routines need to be activated; and the landowners served by the District are seeing reduced insurance costs as a result of the District's FEMA-recognized best management practices.



LWDD's Monitoring and Sewer Intelligence System