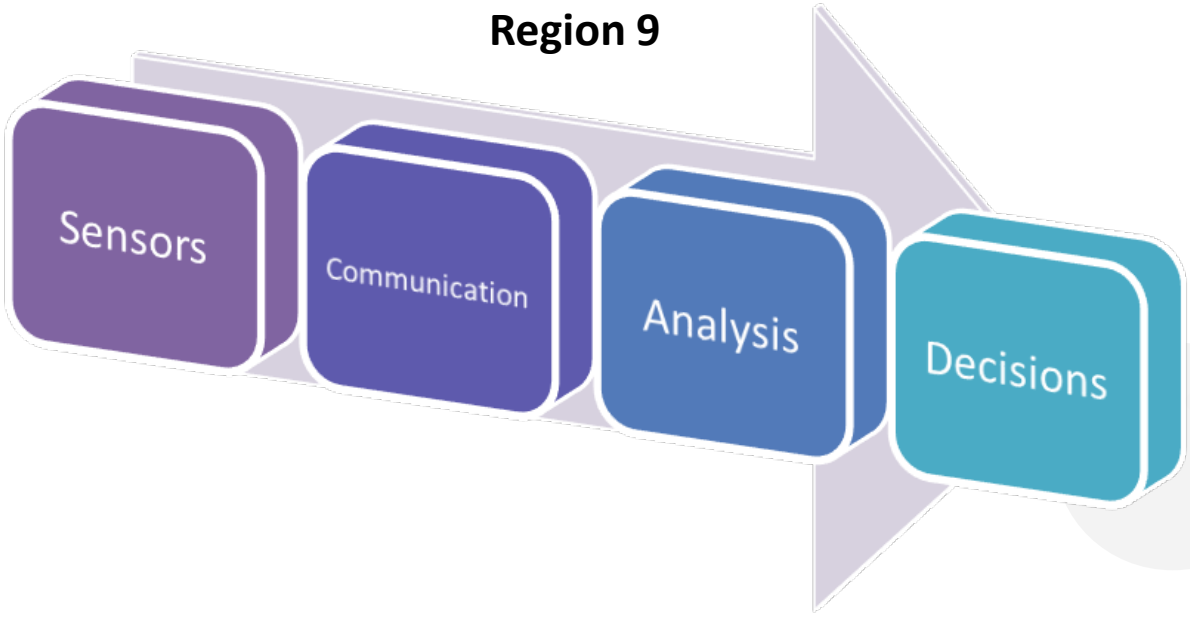
SMARTCOVER SYSTEMS™
TURNING YOUR DATA INTO DECISIONS™

Collection Systems Monitoring: Reducing sewer spills and saving money

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Region 9



State of California
San Diego Regional Water Quality Control Board
June 12, 2019

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ACWA/JPIA Director –Executive Committee - Chair of Workers Comp
California Water Insurance Fund – Director

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Regional Sales Manager
CWEA San Diego Section

SMARTCOVER SYSTEMS®
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What have we learned and what's new?

- SmartCover Systems® can detect, then predict, and optimize operations.
- Catalyze decisions from multiple data sources.
- Create new management response processes to protect public health and the environment.
- The ravages of H_2S damage.
- Full range water level measurements.
- Avoid, not recover from. (John Robertus)
- Accuracy, innovative solutions, cost savings.
- Fewer infections, reduced environmental damage, danger avoided, earlier.
- Reduce corrosion, odor impact.
- Clear signal a surcharge will become a spill.

About SmartCover® Systems™

SMARTCOVER® SYSTEMS™
TURNING YOUR DATA INTO DECISIONS™

- 14th Year of Operations
- Based in Escondido
- Founded by Two Elected Water Agency Officials
  - Greg Quist, Ph.D.
  - David Drake, EE
- 14 Patents

Our Mission

SMARTCOVER SYSTEMS™
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SmartCover Systems provides end-to-end real-time monitoring systems to our customers who benefit:

- ***Internally, through lower costs, improved performance and lower risk; and***
- ***Externally, by safeguarding our water, public health and the environment.***

About SmartCover® Systems™

SMARTCOVER® SYSTEMS™
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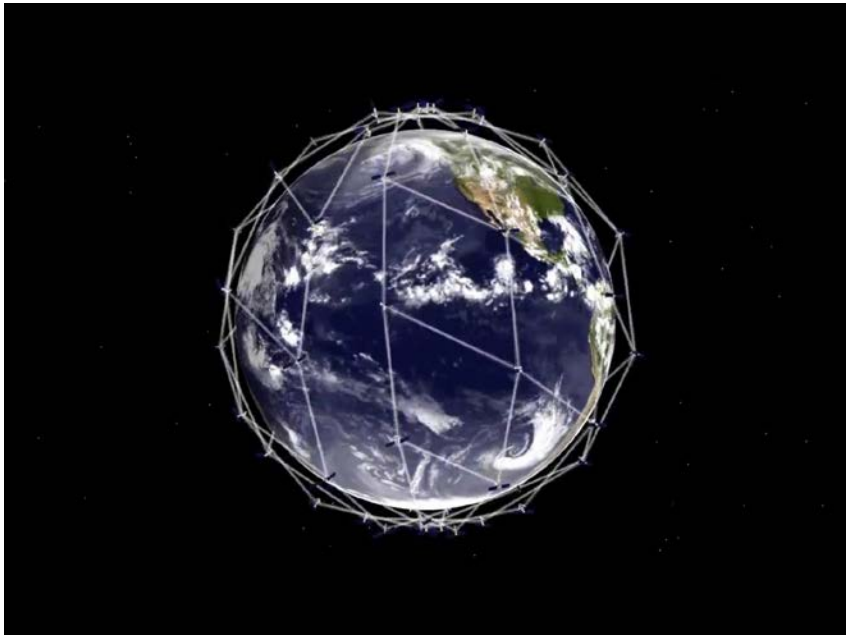
- Cloud-Based
- Iridium Satellite Network
- No Confined Space Entry Installation
- SmartTrend
- Two-Way Communications



About SmartCover® Systems™

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Region 9 - Applications

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- SSO Prevention
- Flow Estimation
- I&I Detection
- SmartClean®
- Storm Water
- Lift Station Back-Up
- Easement Monitoring
- Pump-Run Time
- Security
- Potable Water Tank Monitoring
- H2S Monitoring

Region 9 – Agencies

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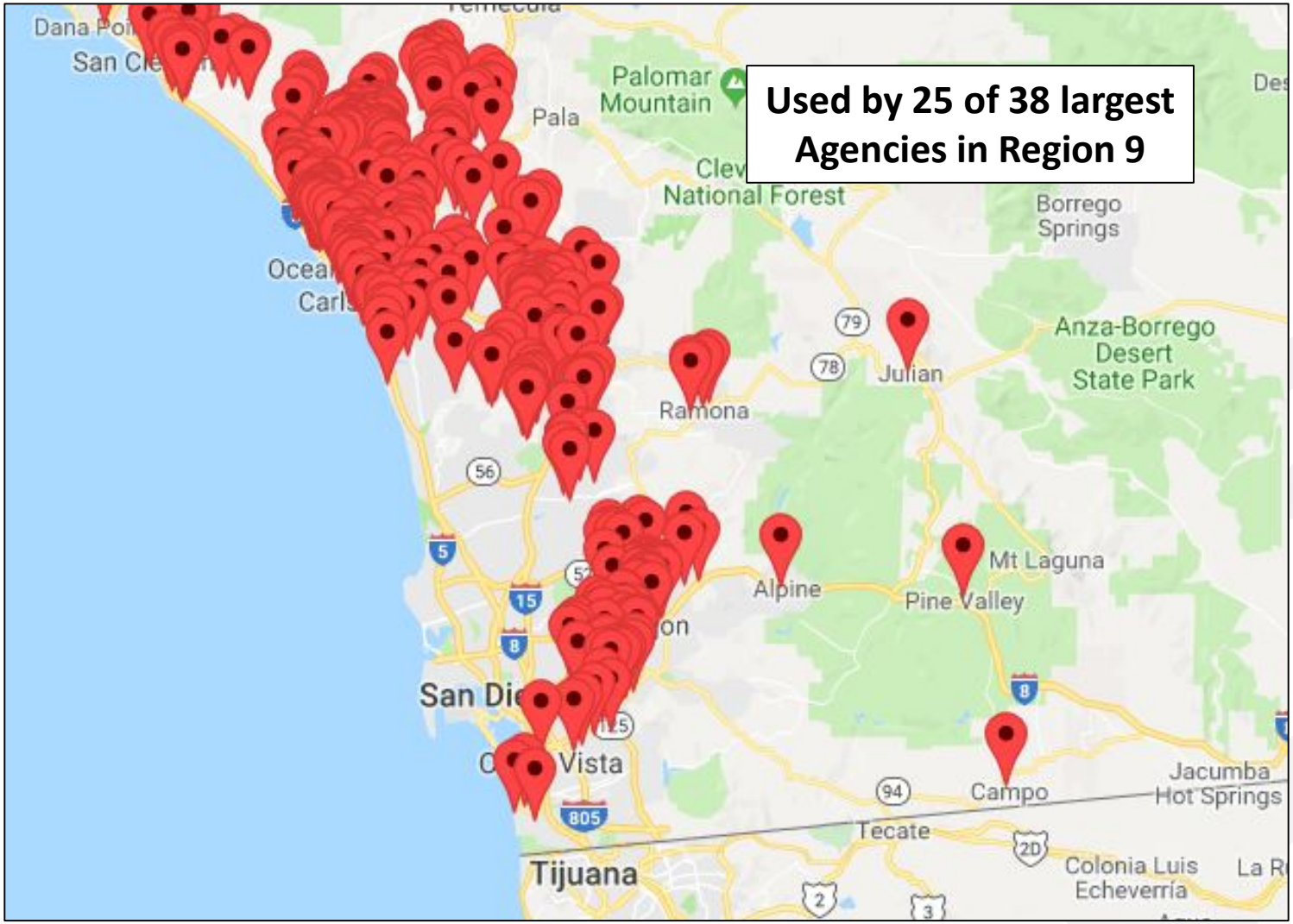

North County Agencies

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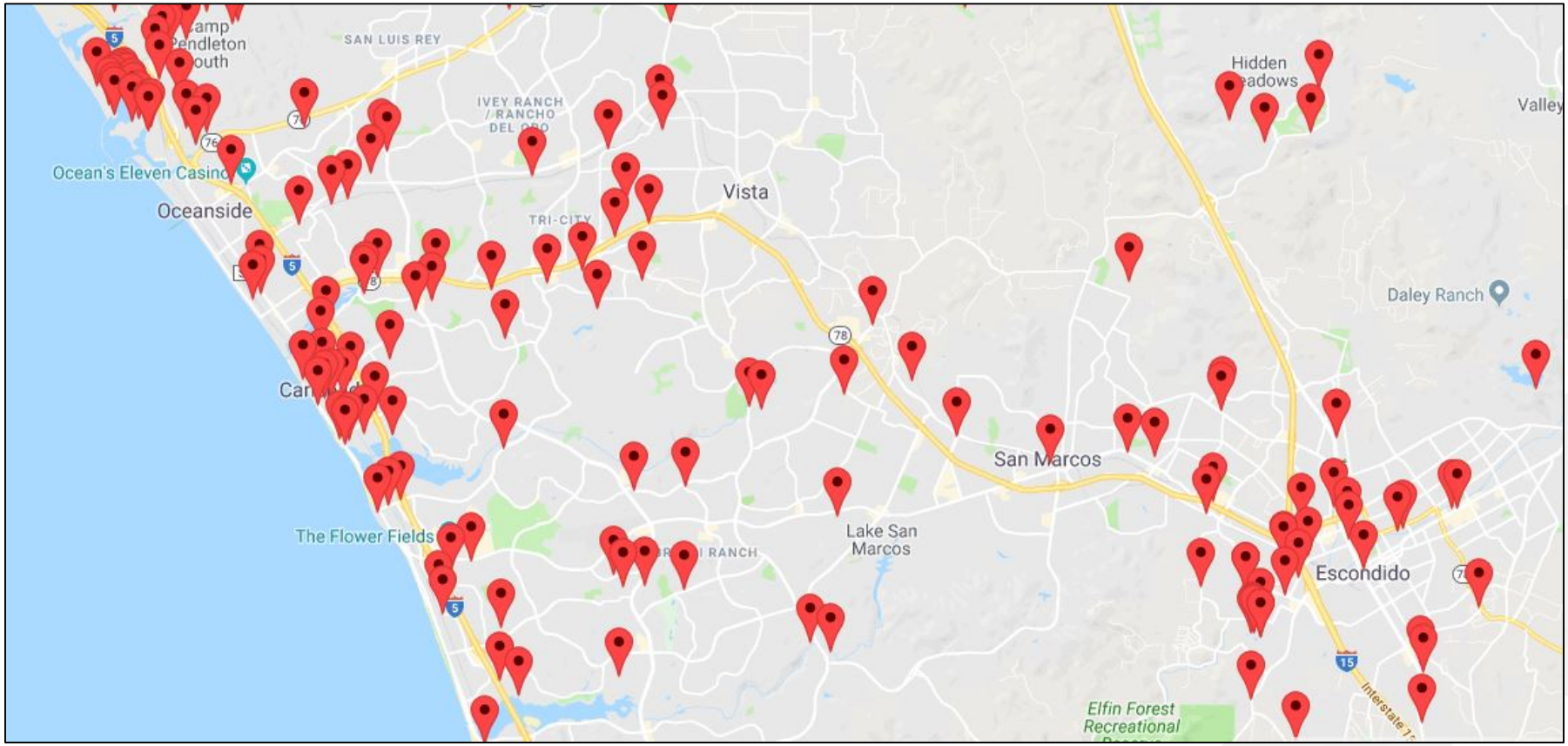

Camp Pendleton

- **SSO Prevention**
  - **5 Spills Saved**
  - **3 Near Ocean**
- **Improved Response Time**
  - **4-8 Hours (Before)**
  - **15-30 Minutes (After)**

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Remote Monitoring for Large Areas

Case Study

SmartCover® Enables Camp Pendleton Marine Base to Monitor Lift Stations and Remote Water and Wastewater Assets

Who: Camp Pendleton Marine Base, CA

Profile: Marine Corps Base Camp Pendleton is the major West Coast base of the United States Marine Corps, located on the Southern California coast, in San Diego County, and bordered by Oceanside to the south, Cleveland National Forest, Orange and Riverside counties to the north, and Fallbrook to the east.

Camp Pendleton maintains over 237 miles of conveyance infrastructure (including gravity mains, force mains, and laterals) ranging from four inches in diameter to 36 inches in diameter, 62 sewage lift stations, and 3,140 sewer manholes. The water system includes 24 wells, 375 miles of water mainlines, and 23 reservoirs.

Problem: Camp Pendleton's 125,547 acres host a self-sustaining water supply, sewage treatment plants, telephone and electrical systems. With a daytime population of more than 70,000, Camp Pendleton must maintain its self-sustaining capabilities. As one of the largest military facilities in the United States, Camp Pendleton presents special challenges in terms of managing remote sewer lines, manholes, and lift stations to identify emerging issues before they can become problems such as sanitary sewer spills (SSOs). Monitoring of water levels in water tanks is also a key objective to manage potable water supplies.

Details: SmartCover Systems give Camp Pendleton staff the ability to remotely monitor wet well and collection system levels to be proactive in managing water and wastewater assets, as well as responding to prevent possible spills from occurring. Currently, Camp Pendleton has 103 SmartCover units installed at 62 wastewater lift stations, 28 sanitary sewer manholes and 19 potable water reservoirs.

Results: Camp Pendleton staff can now monitor real-time conditions across all wastewater lift stations, remote manholes and reservoirs, which has enabled them to prevent multiple spills at lift stations due to power, mechanical and electronic failures and to improve overall system management efficiency.

As is the case with most large military bases across the United States, Camp Pendleton needs to efficiently manage water and sewer infrastructure across a very large area, while juggling security concerns, difficult-to-access locations, and sensitive environmental concerns. SmartCover is also unique in the use of military-grade communications via the Iridium satellite network to assure unparalleled uptime, especially in remote locations and during storms that can knock out conventional cell phone networks.

In these situations, SmartCover real-time remote monitoring acts as a "force multiplier" for water and wastewater professionals to enable them to respond rapidly while also identifying trends that can help improve management efficiency and avoid latent issues from becoming emergency problems.

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MKT-131-A

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Case Study: Escondido

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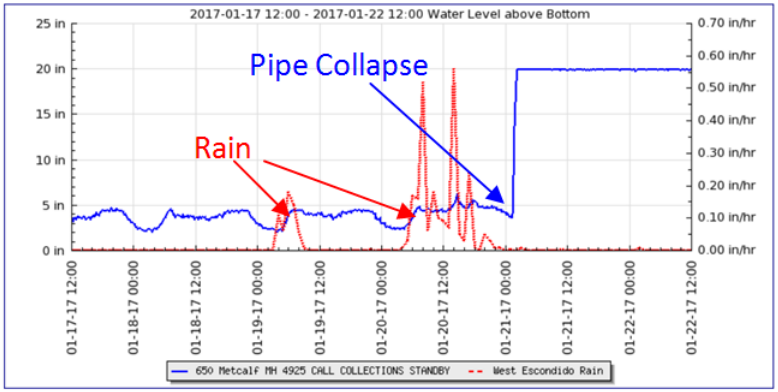
The Spill that Didn't Happen



- "Atmospheric river" storm, January 2017
- Inflow from storm prompts large line collapse

- SmartCover® positioned 5 MH upstream
- Detected anomalous level & alarmed
- City staff responded
- Performed near-term fix
- Pipe currently being replaced

NO SPILL

Estimated savings: "Millions"

Hawthorne, CA – Spills Saved

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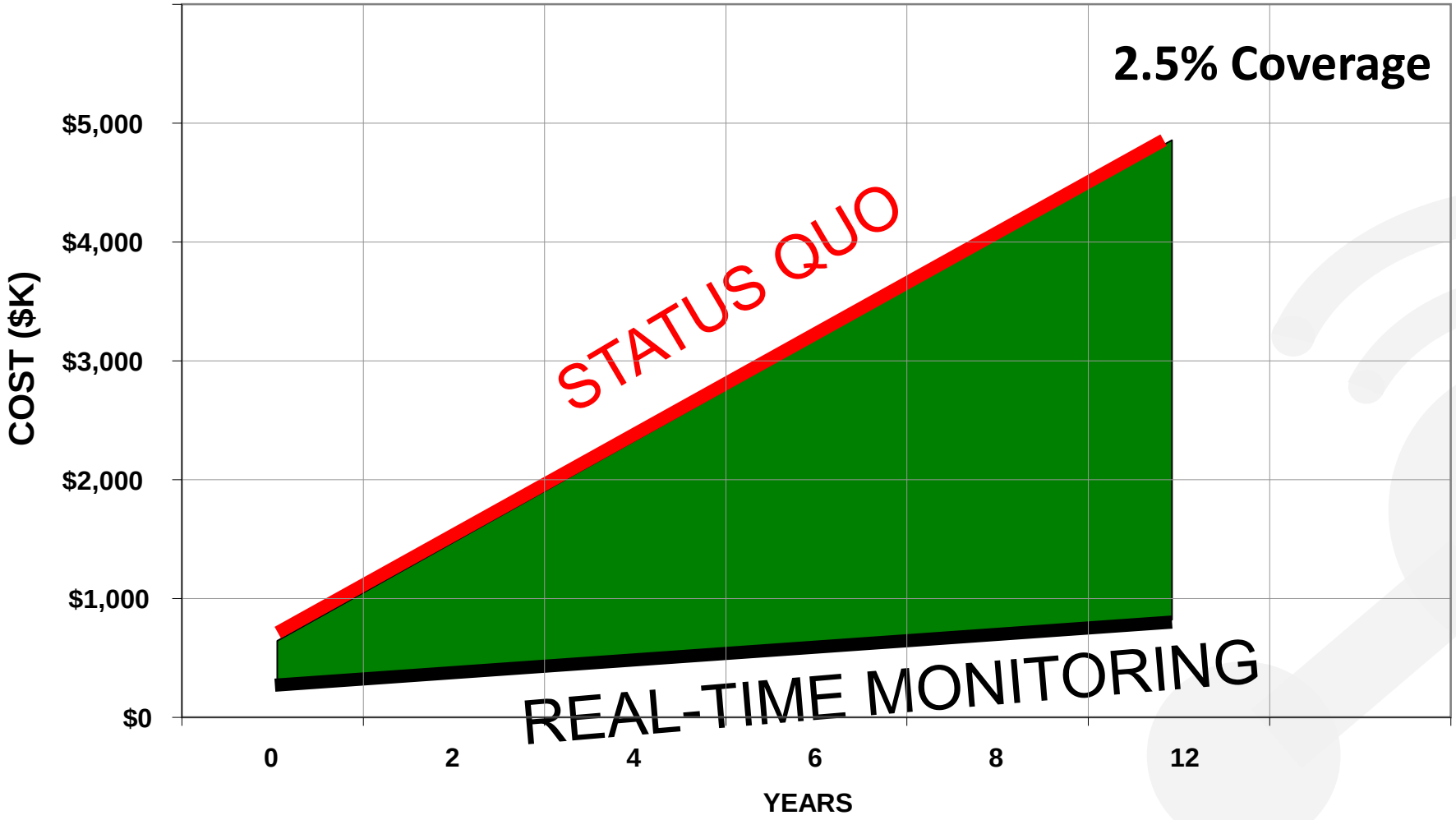
> $4.8 million Savings in 12 years & > 99% Reduction in Spills



San Antonio, TX - Spills Saved

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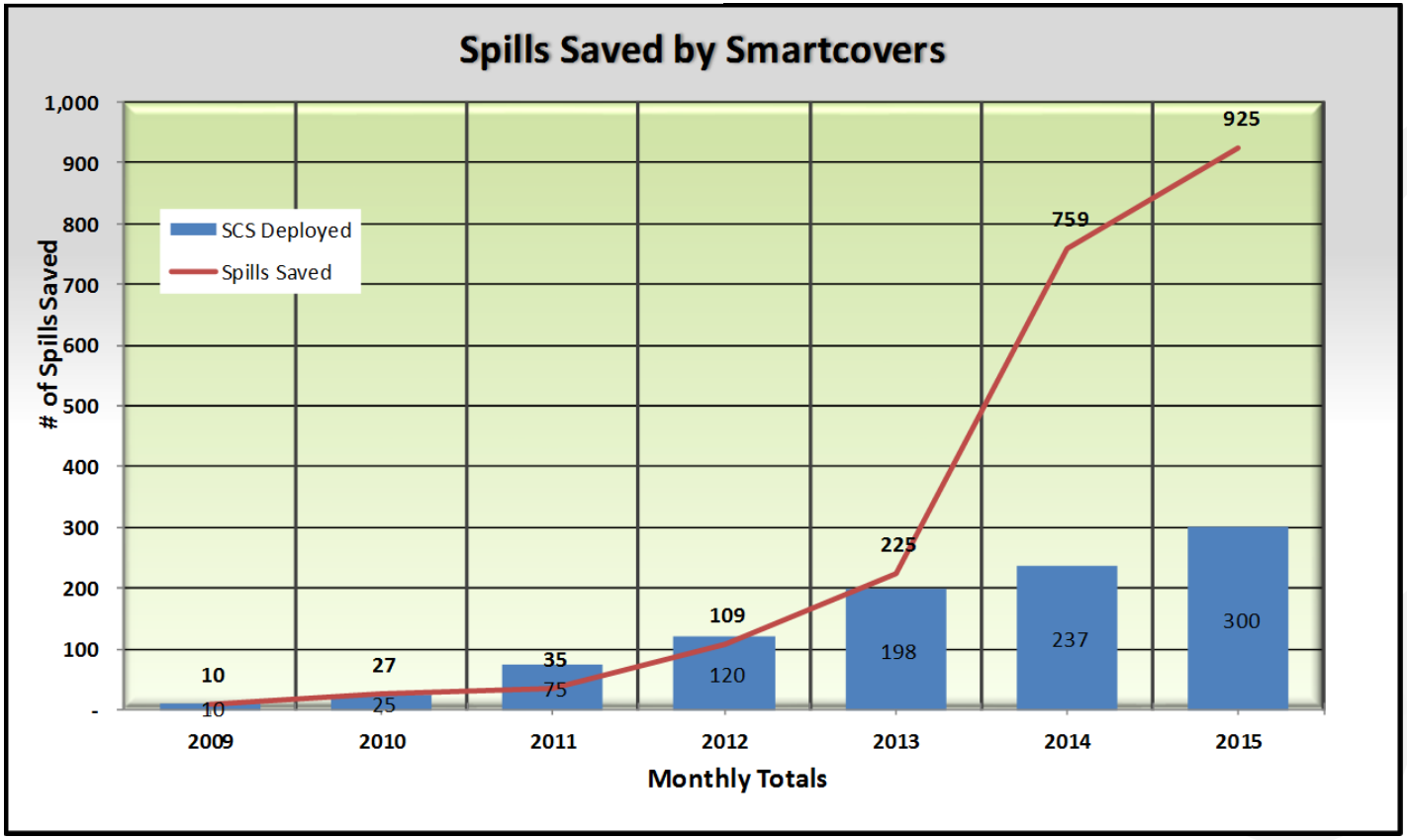
- **Period 2009-2017**
  - **> 1,368 spills saved**
- **System coverage - 0.3%**

NET SAVINGS ~ $4.4MM



San Antonio, TX

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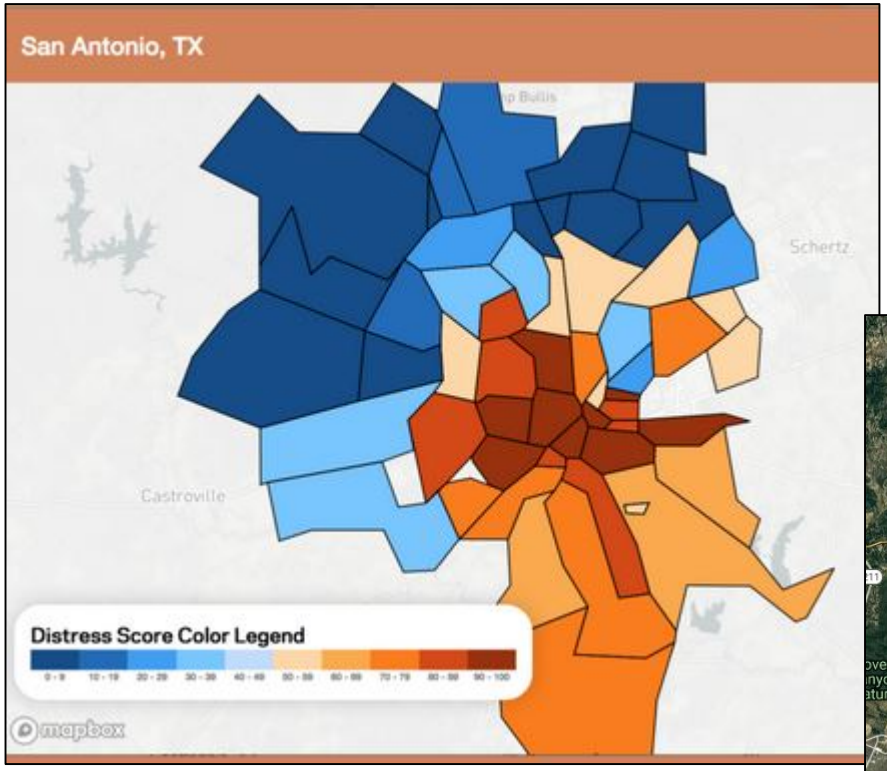

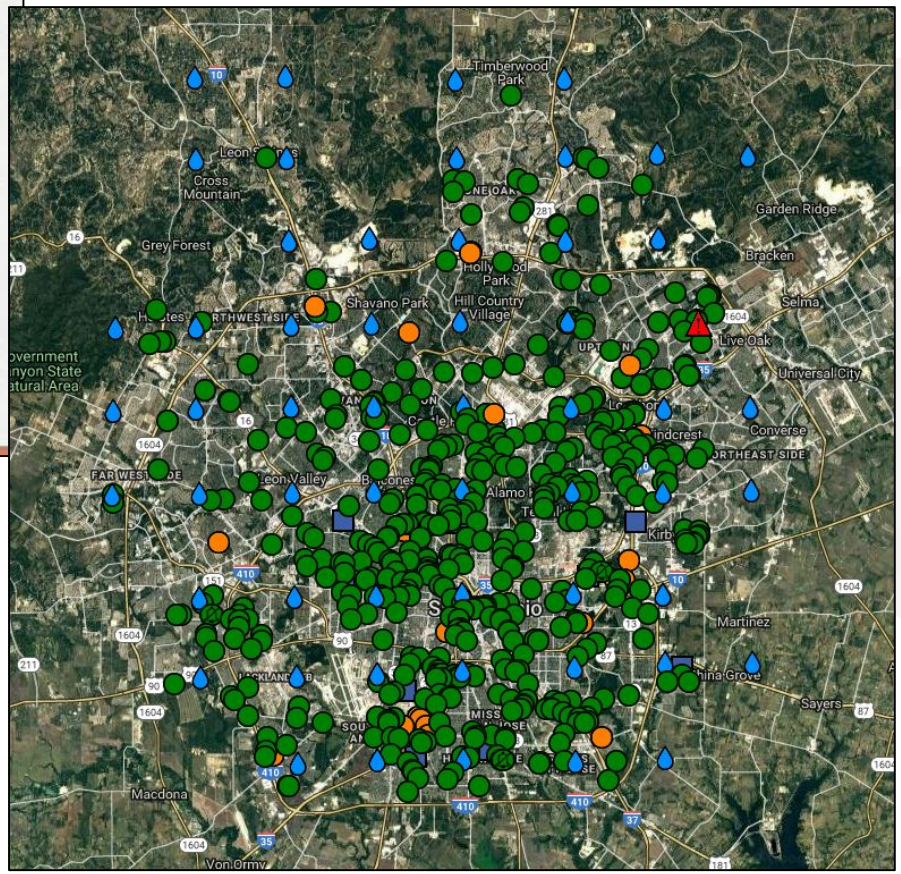

Stockton, CA

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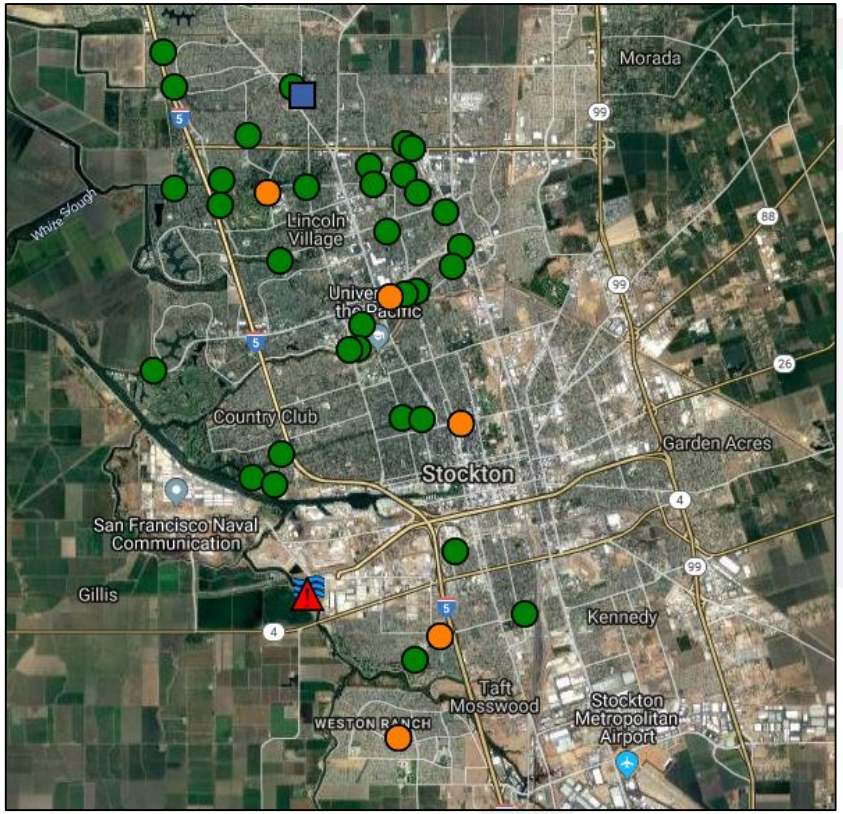
- Utilizing SmartCover Since 2010
- 40 SmartCovers Installed
  - SSO Prevention
  - Lift Station Back-Up

CITY OF STOCKTON



SmartRain™

SMARTCOVER SYSTEMS™
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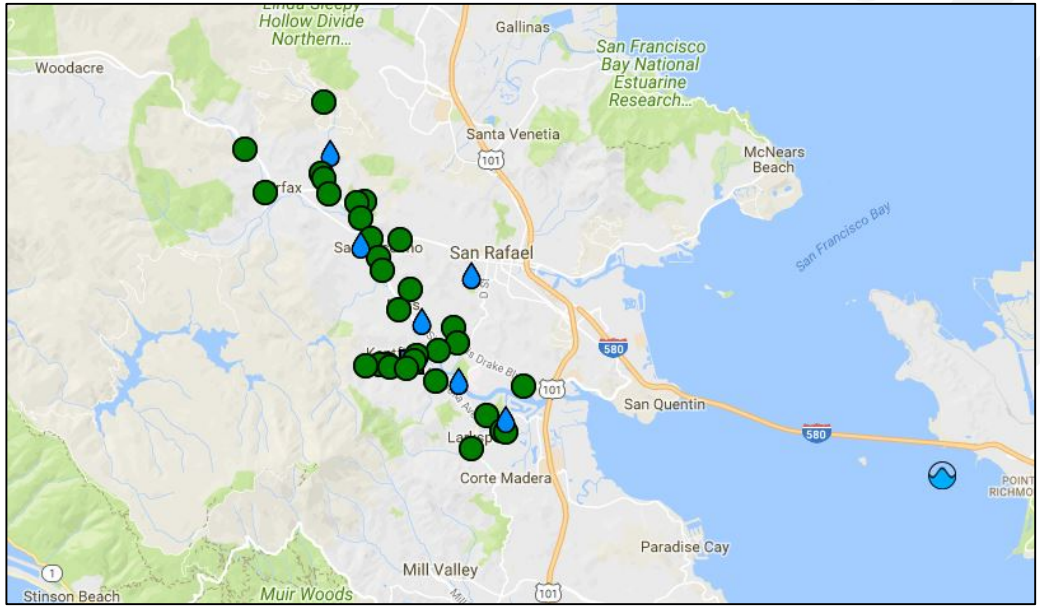
- Uses NOAA Doppler Radar
- 0.62 Mile Area
- Multi-Graph Overlay
- Spreadsheet Downloads
- No Installation / Maintenance



SmartRain

SMARTCOVER SYSTEMS™
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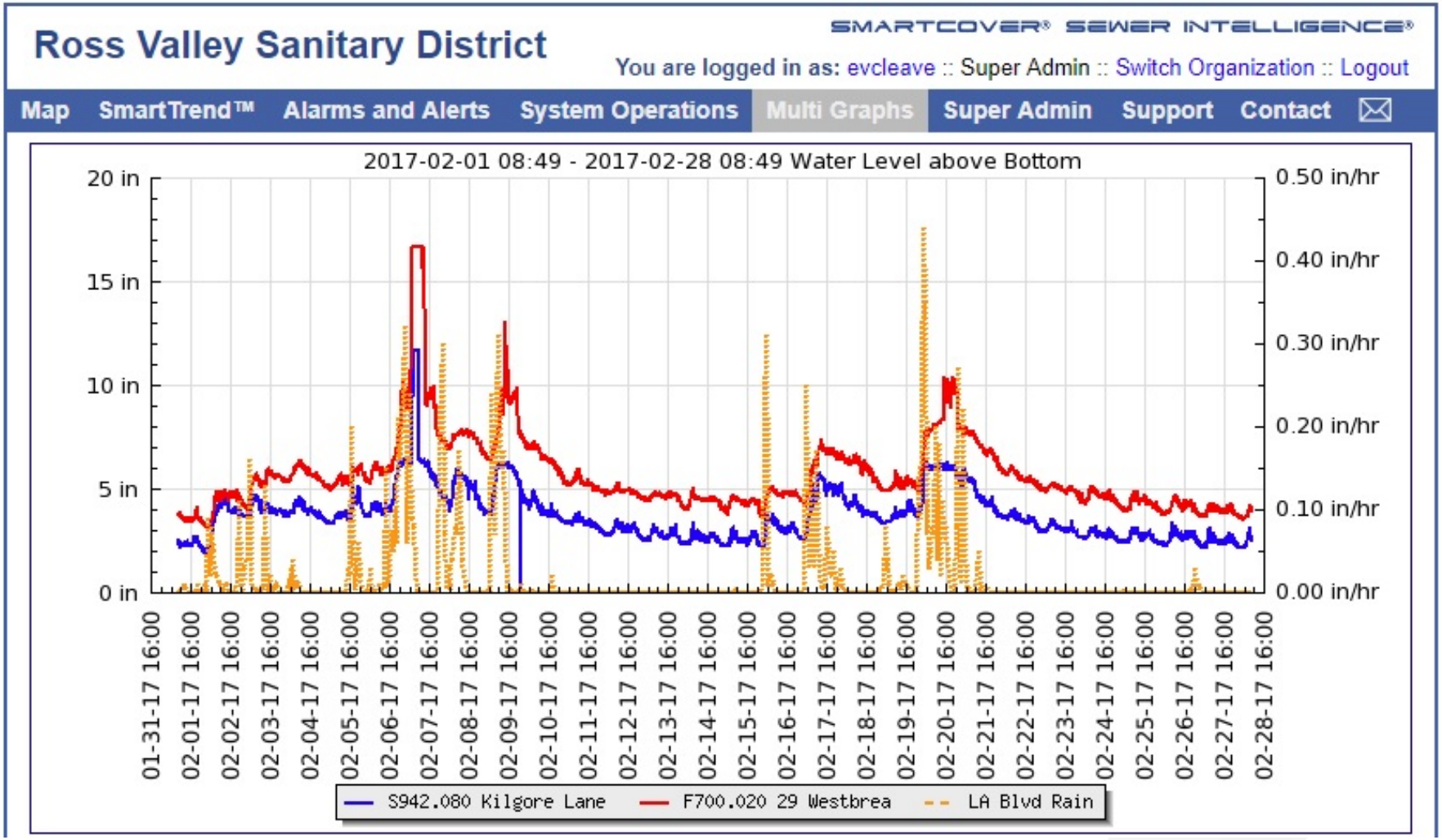

SmartTide

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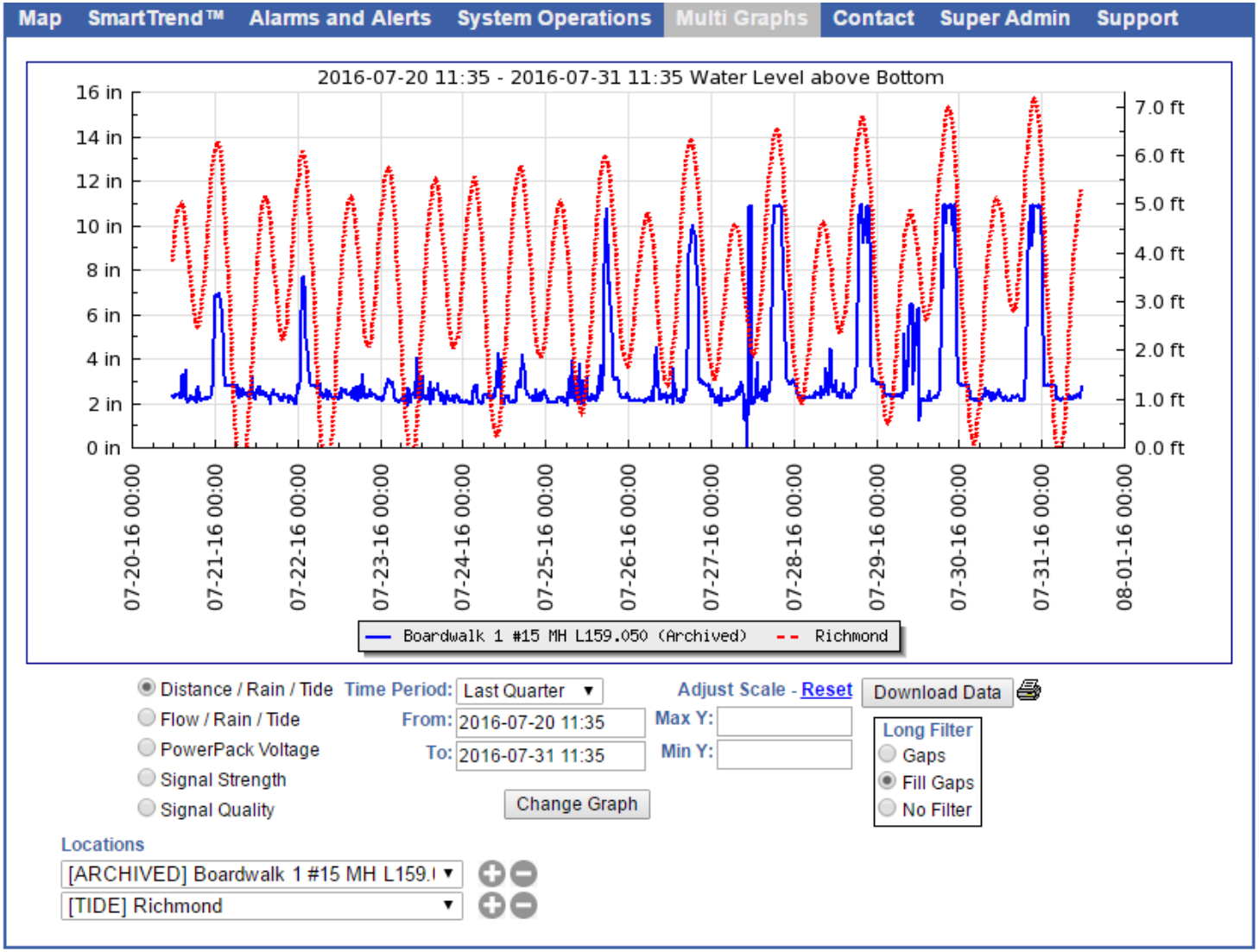

Lessons Learned

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- **Observe the relationship between rain and sewer levels to prioritize I & I repair locations (SmartTrend)**
- **Observations supported optimal cleaning which reduced cleaning costs in San Antonio, TX by 95% (SmartClean)**
- **We could adapt the installation to meet many needs, including Combined Sewer Overflow (CSO) sites**
- **With the Iridium satellite system, we are immune to terrestrial interruptions**
- **Adapted to read water level and flow, water pressure, H_2S concentrations in air to 1,000 ppm, and can measure nearly any analog or digital information source**
- **Client support is critical, we do continuous improvement, and reputation trumps profit**

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