

# Gaining on 90%+ Flow Meter Coverage in Study Areas Overrun by Pump Stations

Sarasota County, FL

January 2022

Meghan C. Otis, EIT  
Karen N. Chan



# Presentation Overview

---

**Bridging the Gap**

**Background**

**Coverage Progression**

**Results**

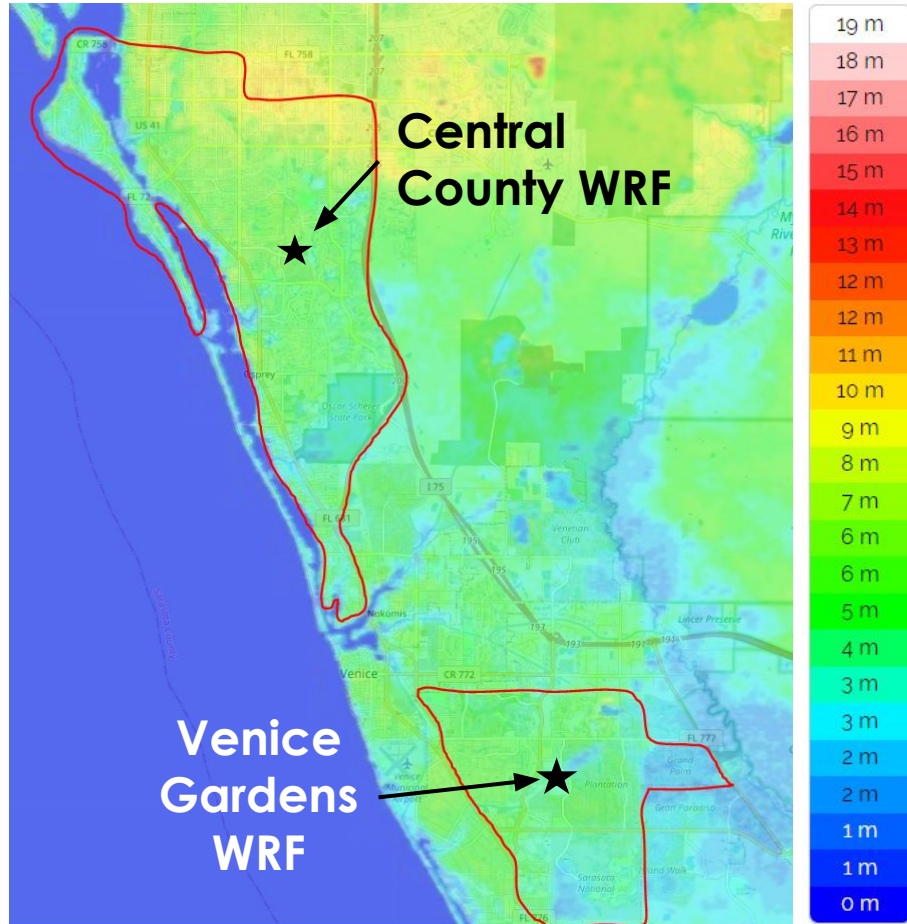
**Why Coverage Mattered**

# Bridging the Gap

---



# Background



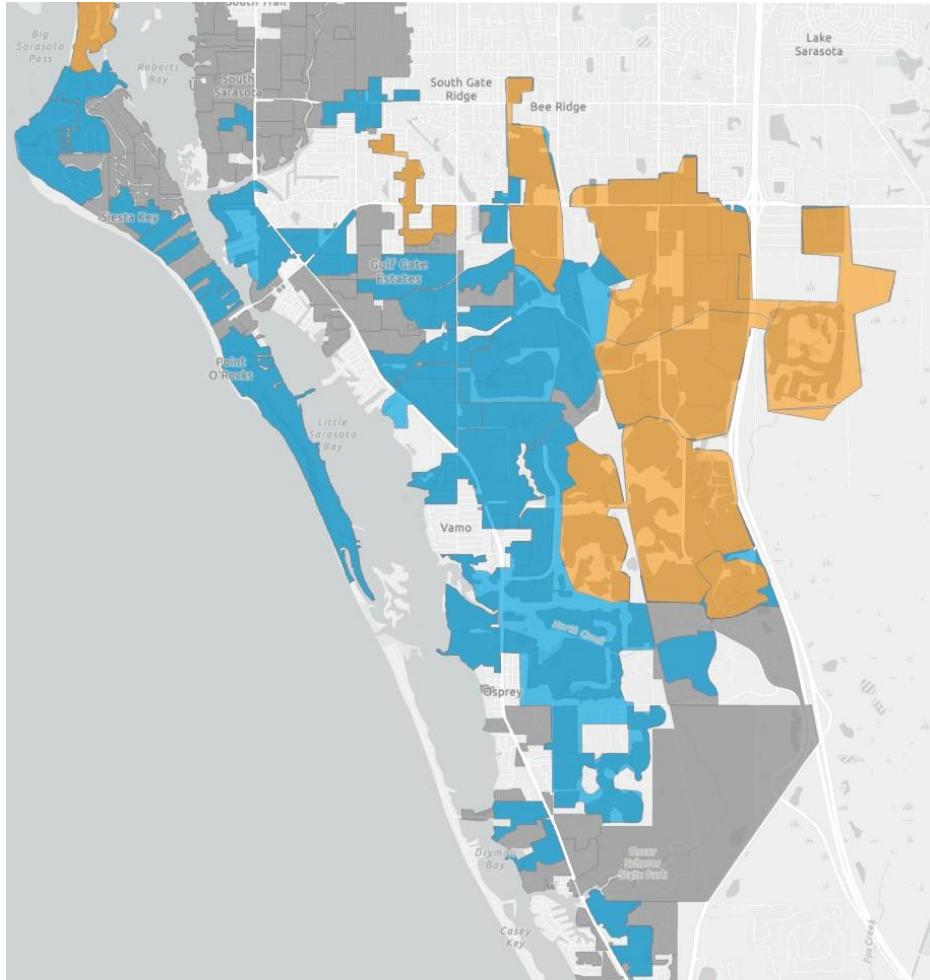
## Sarasota County

- Siesta Key (West Coast)
- Average altitude = 4 meters above sea level
- Nearly 300 pump stations
- Over 2 million linear feet of gravity sewer
  - 50 temporary flow meters
    - 6 months
  - 6 rotating flow meters
    - 3 months
  - 74 lift station evaluations
  - 241 flow isolations

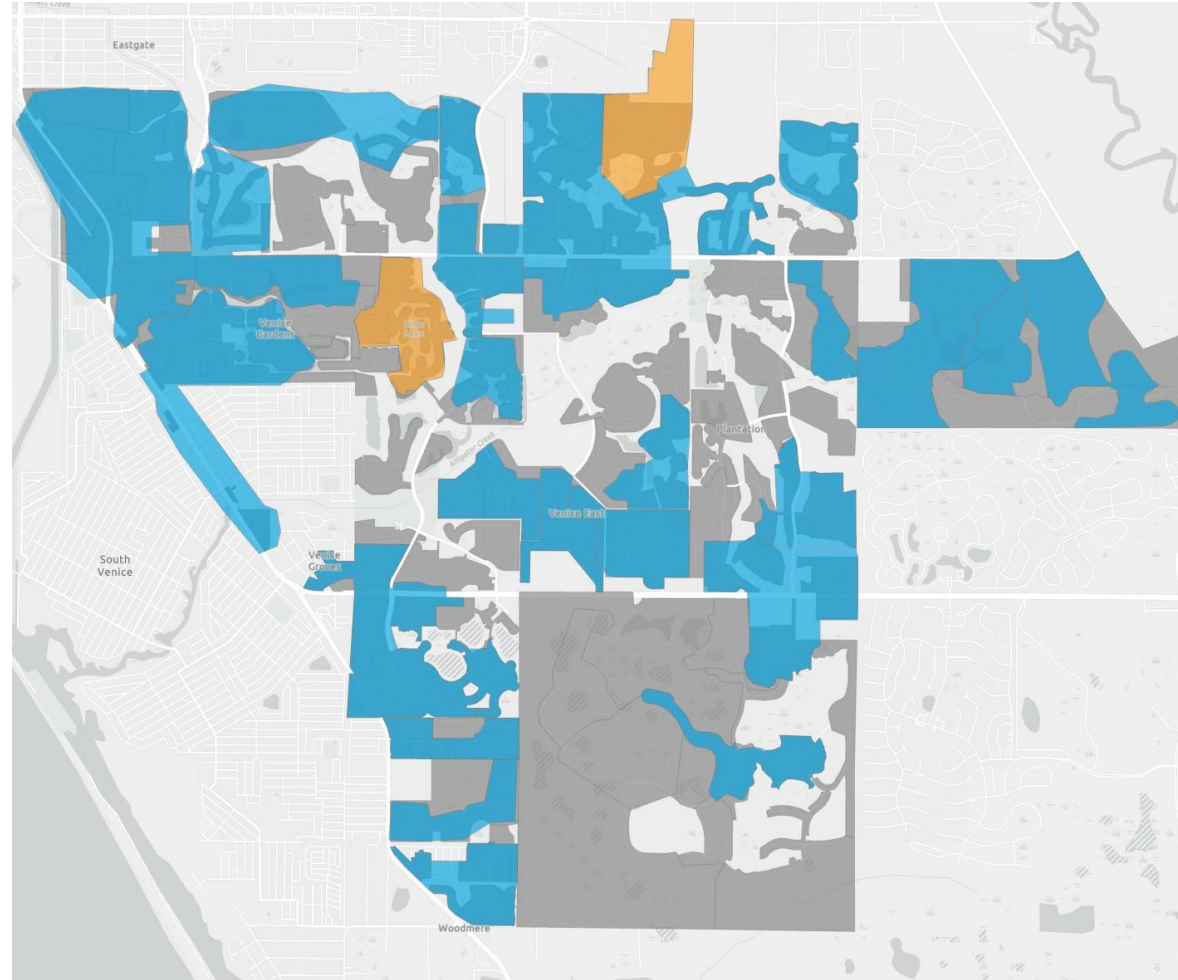


# Coverage w/ Flow Meters Only

## Central County – 66% Coverage

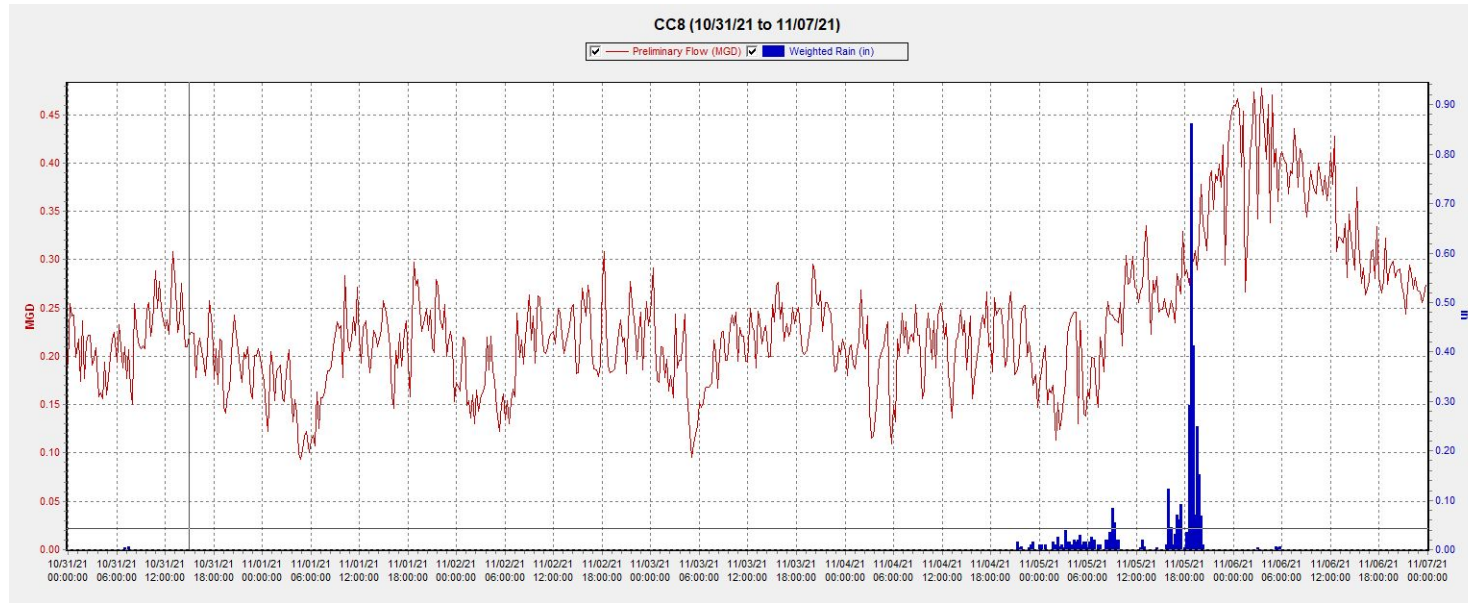


## Venice Gardens – 66% Coverage

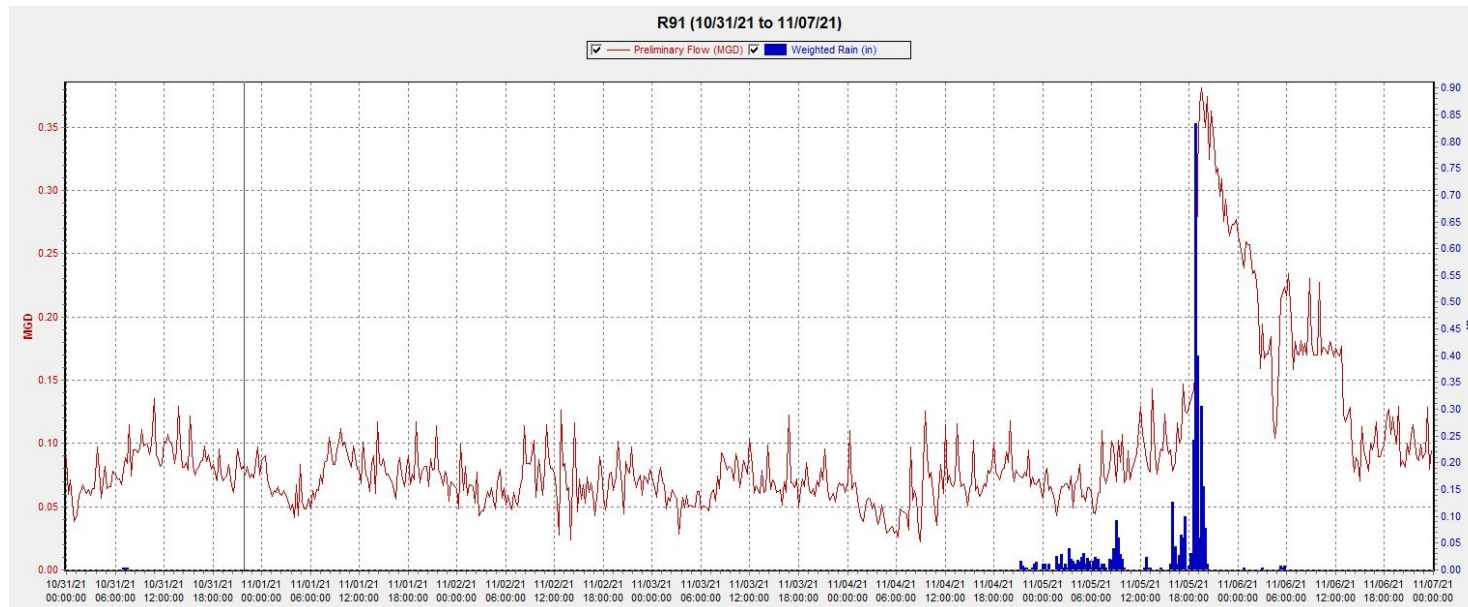




# Permanent vs. Rotating Meter Results



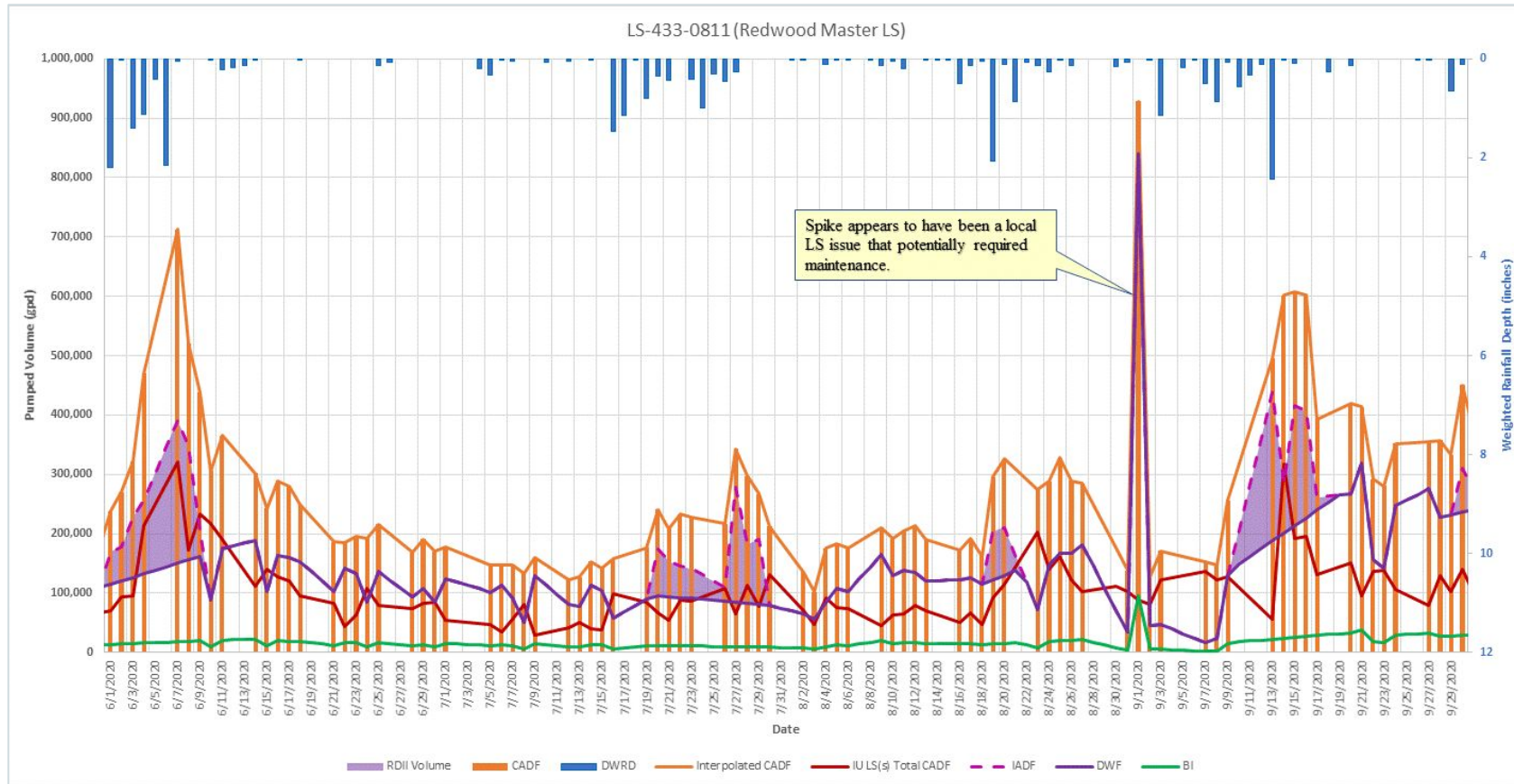
Permanent  
(Downstream)



Rotating  
(Upstream)



# Lift Station Evaluations



- Used historical lift station SCADA & rainfall data to confirm presence/ influence of I/I
- Following values were determined:
  - CADF = Composite Average Daily Flow
  - IADF = Individual Average Daily Flow
  - Dry periods
  - DWF = Dry Weather Flow
  - RDII = Rain Derived I/I (infiltration/inflow)
  - BI = Base Infiltration



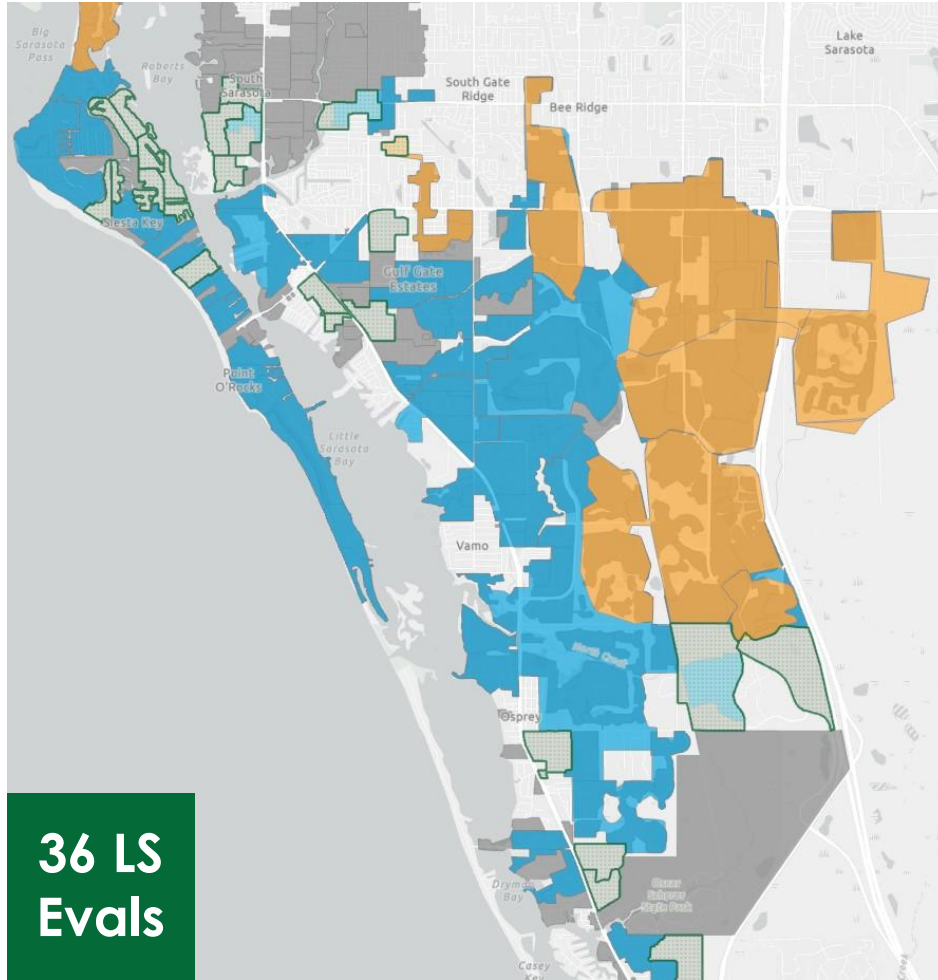
# Lift Station Evaluation Results

---

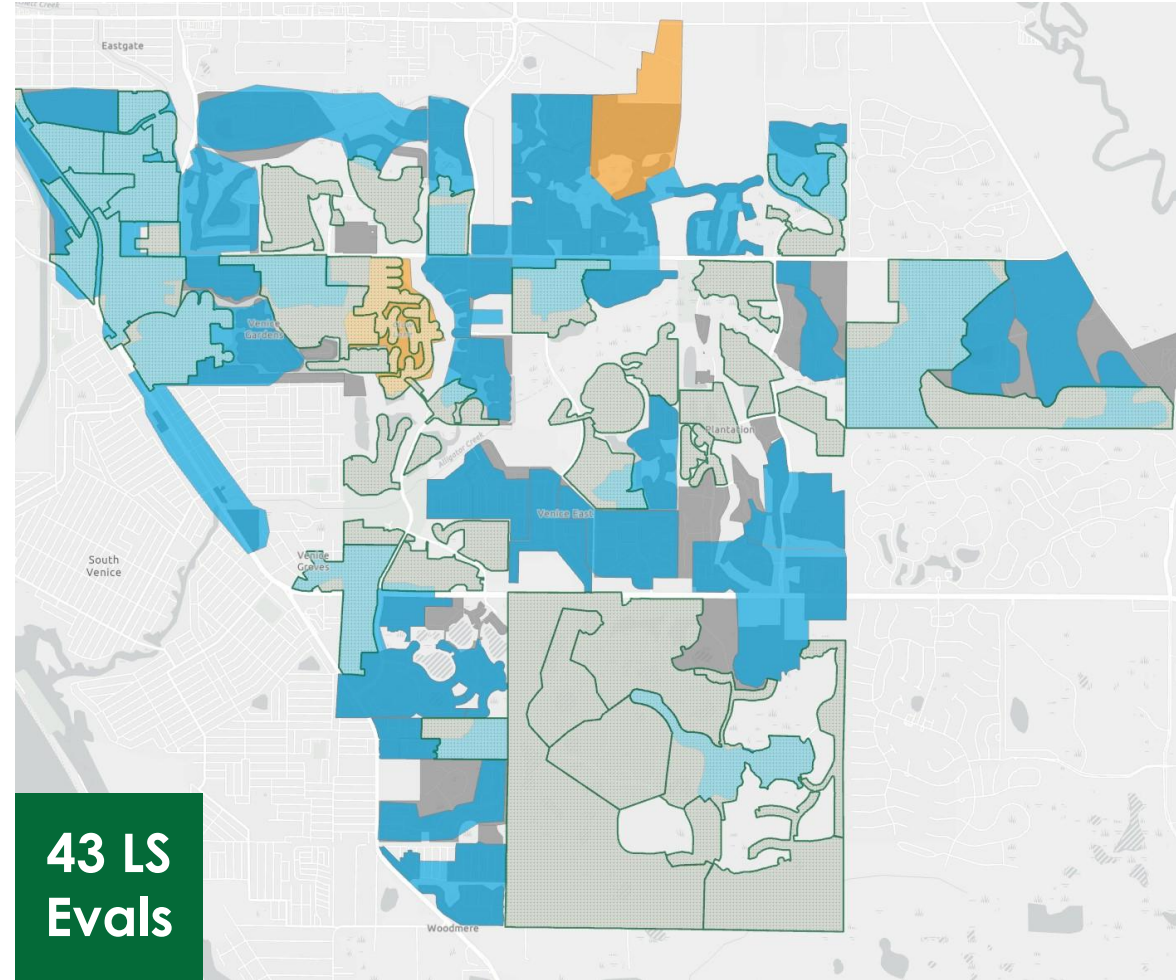
- Helped select locations for rotating flow meters and/or flow isolation measurements
  - Total RDII volume  $\geq 2\%$ : **greater** priority
  - Total RDII volume 1%- 2%: **high** priority
- Increased overall coverage of Central County by 24% & Venice Gardens by 29%
- Where metered areas & LS evals overlapped, historical data confirmed most I/I sources

# Coverage with Lift Station Evaluations

## Central County – 90% Coverage



## Venice Gardens – 95% Coverage



# Flow Isolations

---

## Dry Weather Flow Isolations

- Taken when water use is at its lowest point in the day (10PM-5AM)
- Used to estimate BI
  - Excessive  $\geq 4,000$  GPD/IDM (MassDEP guidelines)
- 104 taken in CC; 99 taken in VG

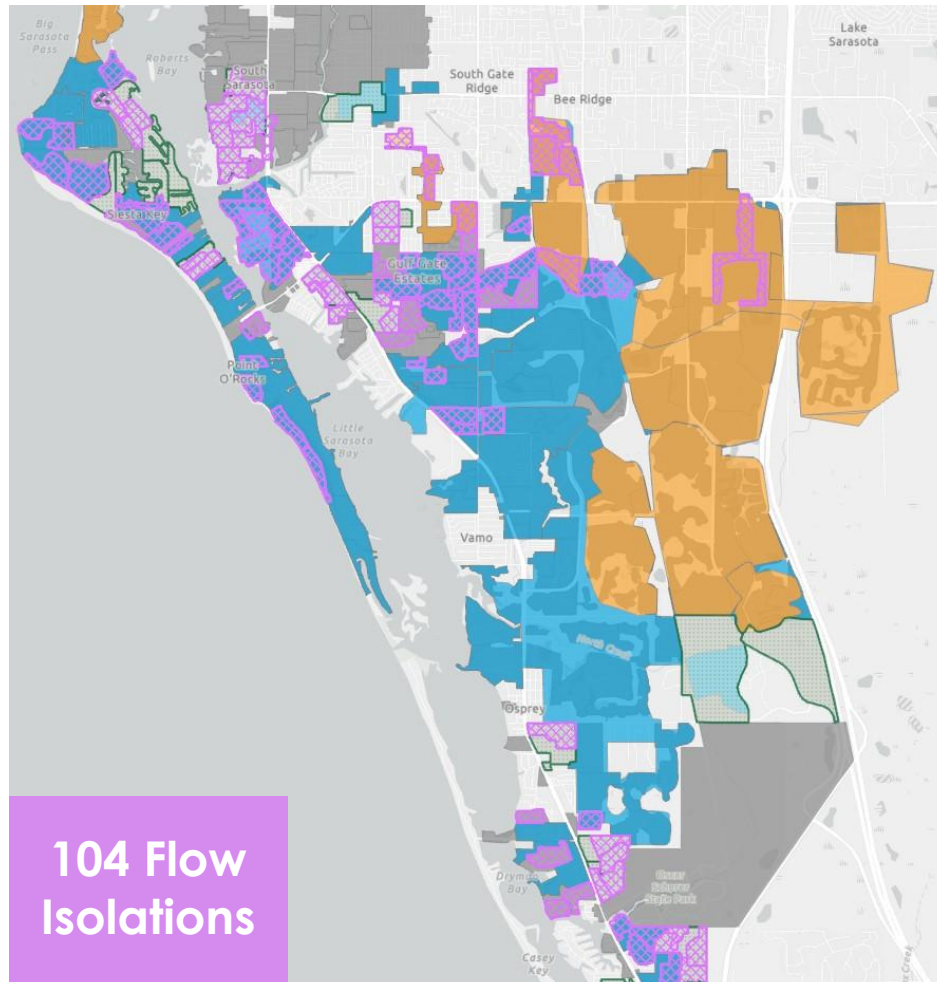
## Wet Weather Flow Isolations

- Taken after  $>1''$  of rainfall in 24 hours
- Used to estimate inflow
- 38 taken in VG

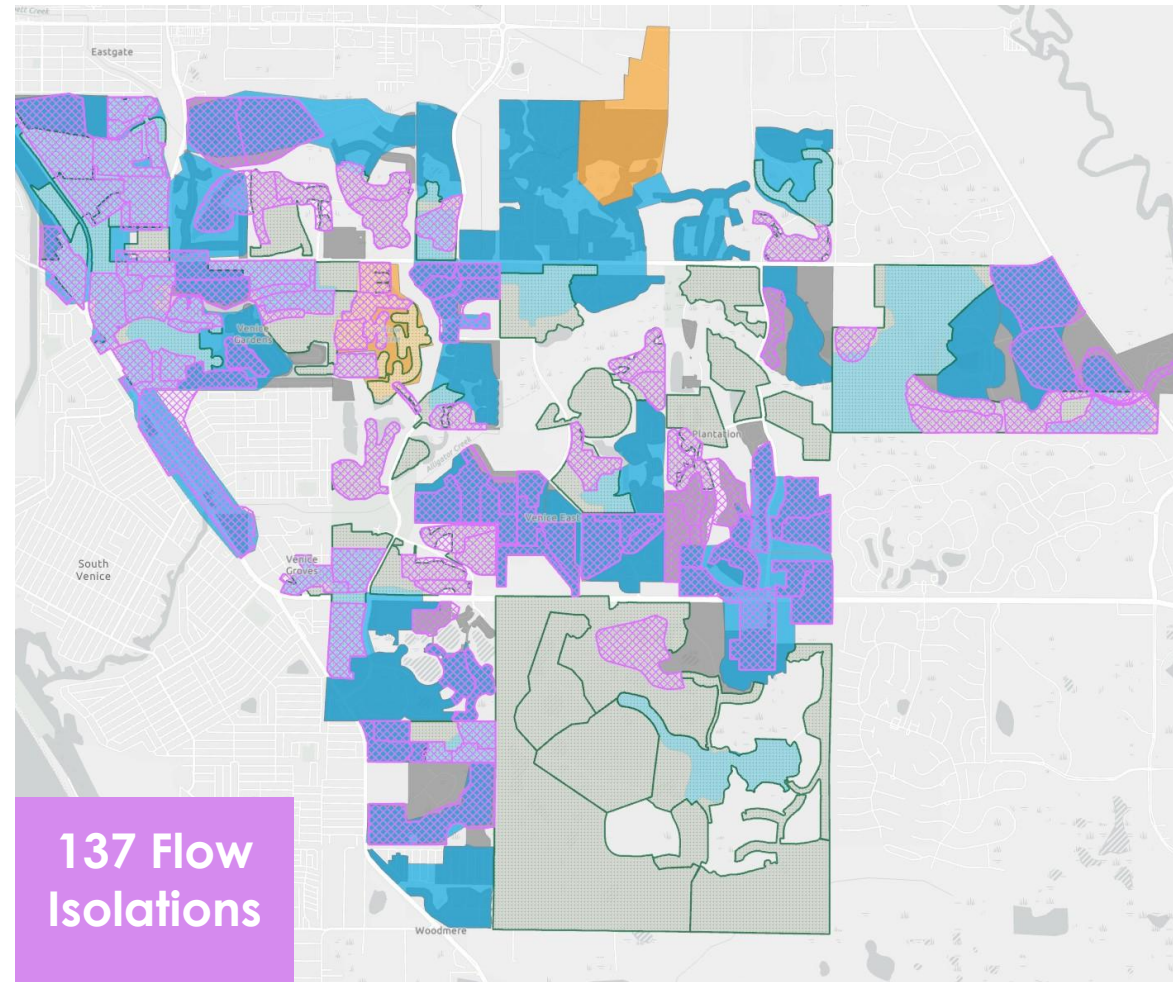


# Coverage with Flow Isolation Measurements

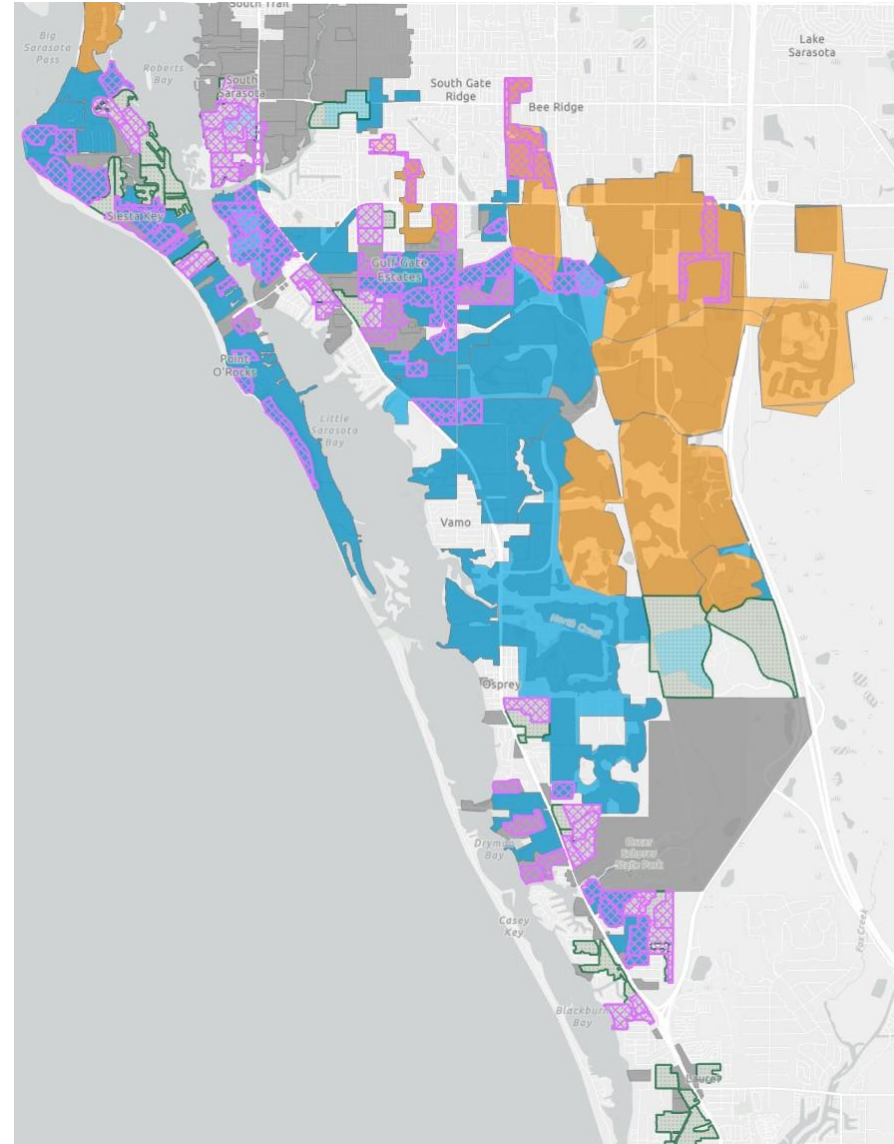
## Central County – ~99% Coverage



## Venice Gardens – ~99% Coverage

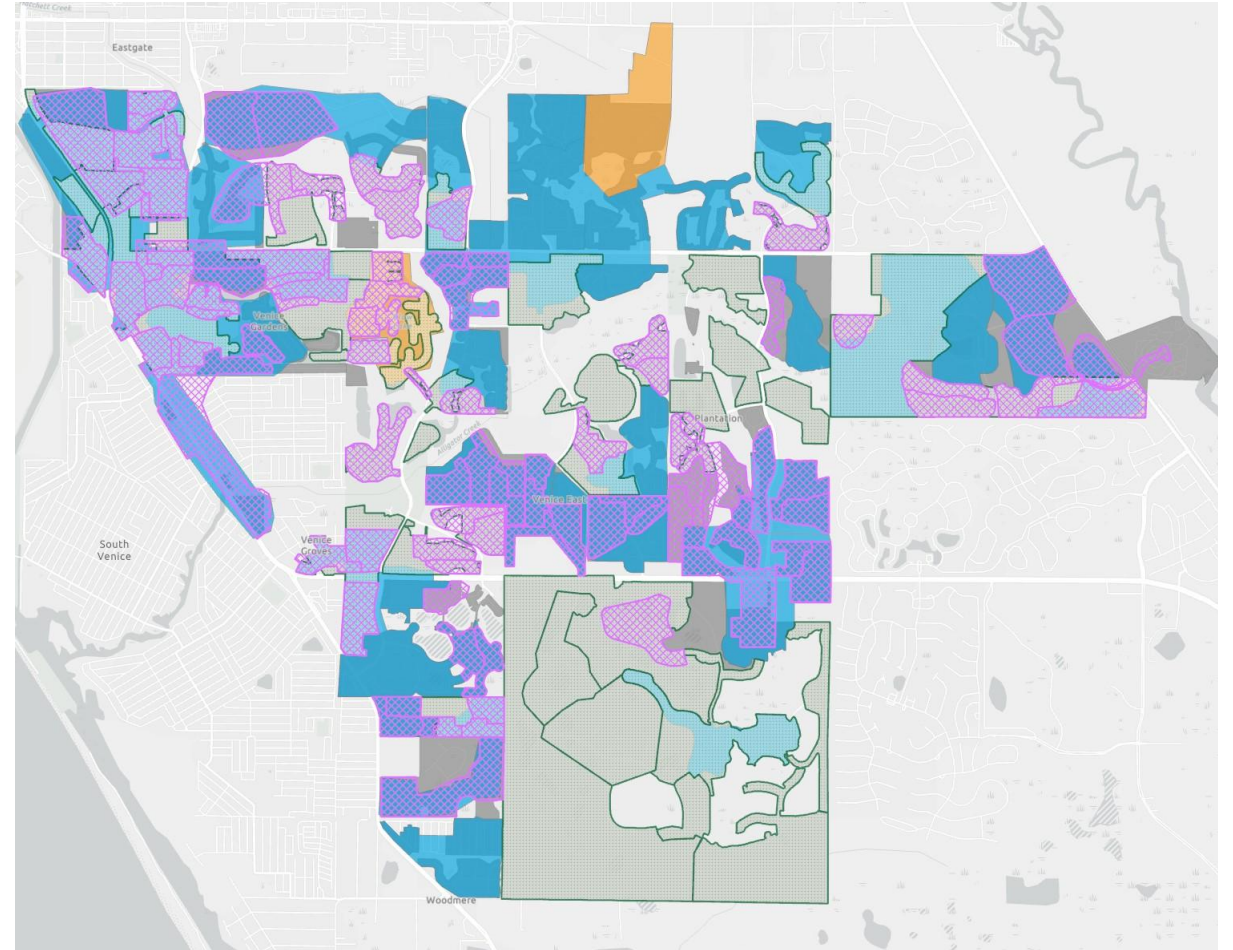
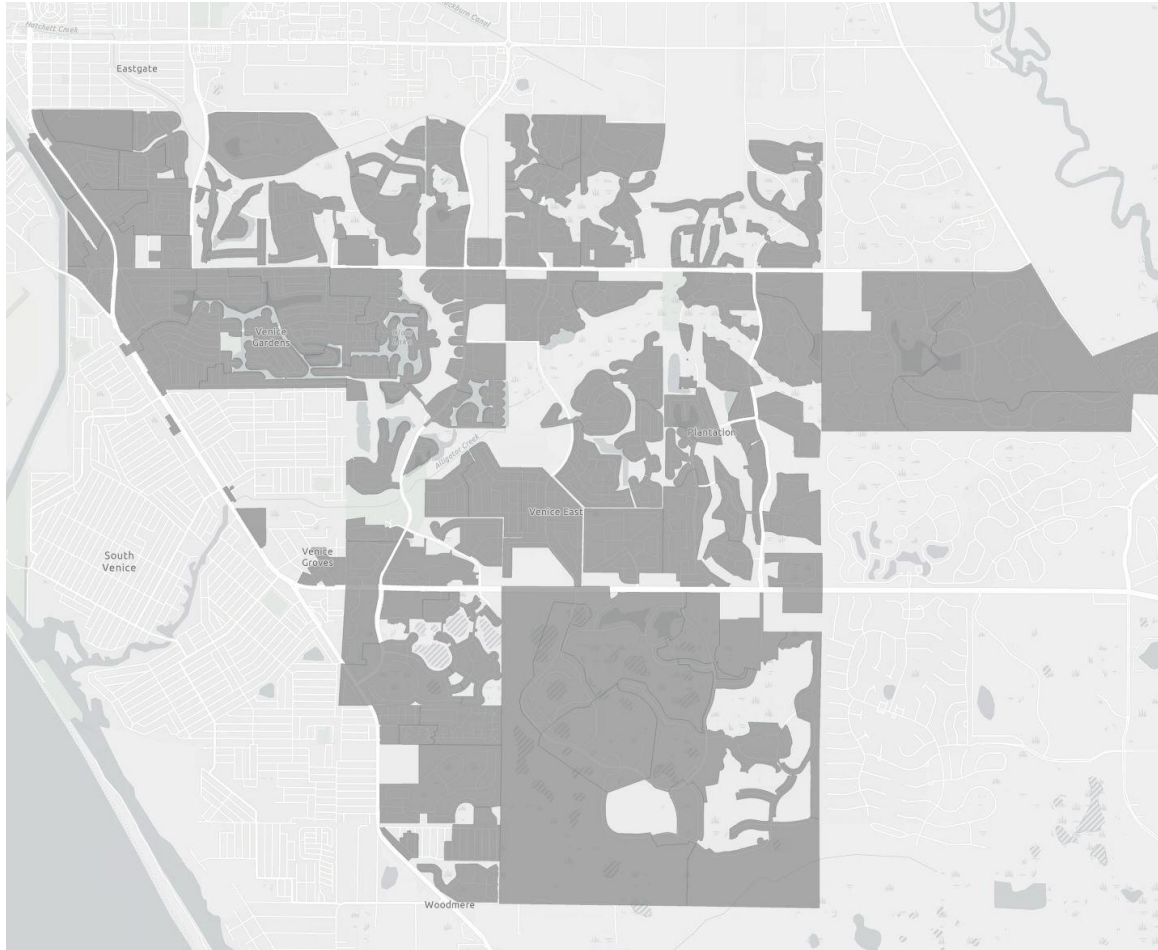


# Final Overall Coverage – Central County





# Final Overall Coverage – Venice Gardens





# Why It Matters

---

## Florida has the perfect trifecta of factors for I/I

- **High Average Rainfall**
  - 28.8" from May-October (as compared to 12.3" in New England)
- **Low Elevation**
  - Mean = 100' (As compared to 633' in New England)
  - Max = 345' (As compared to 6,288' in New England)
  - Min = 0'
- **Close Proximity to Water**
  - Peninsula
  - 18.5% water coverage (as compared to 15.5% in New England)

# Contact Info

---



**Meghan Otis, EIT**

[Meghan.otis@wright-pierce.com](mailto:Meghan.otis@wright-pierce.com)

603.570.7113



**Karen Chan**

[Karen.chan@wright-pierce.com](mailto:Karen.chan@wright-pierce.com)

978.416.8000

# THANK YOU

---