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## **Harnessing MS4 Permit Data: Leveraging GIS for Resilient and Equitable Environmental Management**

Esri Environmental Regulation Webinar Series  
October 5, 2023

# We find ourselves amidst a crisis

- A) Flooding** caused by runoff from **heavier-than-normal** rains and melting snow
- B) Drought** caused by **lower-than-normal** precipitation and over-drafted groundwater tables and aquifers
- C) Urban Heat Islands** caused by impervious surfaces and **hotter-than-normal** temperatures
- D) Polluted Waterways** caused by human activities
- E) All the Above**

... the burden of coping with these challenges falls on local communities



## It's Too Easy For Floods to Bring New York to Its Knees

The world's financial capital isn't ready for an era of climate-charged flooding as a routine early-fall rainstorm showed today.

September 29, 2023 at 11:27 AM PDT

[Listen 2:53](#)



**By Mark Gongloff**

Mark Gongloff is a Bloomberg Opinion editor and columnist covering climate change. He previously worked for Fortune.com, the Huffington Post and the Wall Street Journal.

## Near-record California heat is melting snow and triggering flooding

Flood warnings affect Yosemite National Park and portions of central California as a record-setting snowpack melts.

By [Dan Stillman](#) and [Diana Leonard](#)  
April 28, 2023 at 2:44 p.m. EDT



WEATHER NEWS | Published September 14, 2023 5:25pm EDT

## Atlanta swamped by flooding that swept away cars, inundated Georgia Aquarium

Photos and videos from Atlanta captured images of how the floods impacted the capital of Georgia.

The New York Times

## Arizona Limits Construction Around Phoenix as Its Water Supply Dwindles

In what could be a glimpse of the future as climate change batters the West, officials ruled there's not enough groundwater for projects already approved.

Nevertheless, a viable approach exists for communities to enhance their resilience when confronted with these abnormal conditions

# The Municipal Stormwater Department



...but it will require some changes

- support from leadership
- compliance + resiliency mindset
- watershed-based stormwater planning
- manage runoff as a resource

# City of Salinas, California

Rich in Land, Rich in Values



# CLEAN WATER SALINAS

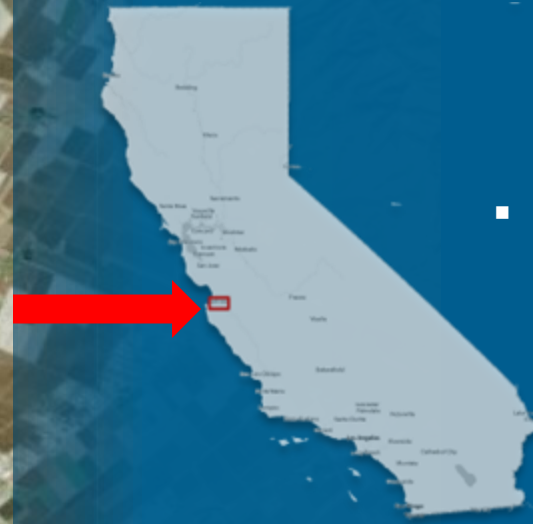
[www.cleanwatersalinas.com](http://www.cleanwatersalinas.com)

Building a healthier community for ALL!



# Salinas, California

- Rich cultural heritage
- Population of 163,000+
- Surrounded by agriculture
- Economically disadvantaged community
- Highly vulnerable to our changing climate
- 5,600 acre-feet per year of stormwater
- All discharges into TMDL waterways



- *Hometown of Author John Steinbeck*

# We've Been on a Journey

Digitally transforming our stormwater program with the support of City leadership



2017

2023

*In 2017, we drew our "line in the sand" and, since then, have continuously honed our program, striving for excellence in every aspect.*



# Ditched the Clipboards and Paper

- We now collect all data digitally

- ✓ BMP Assessments
  - ✓ Maintenance

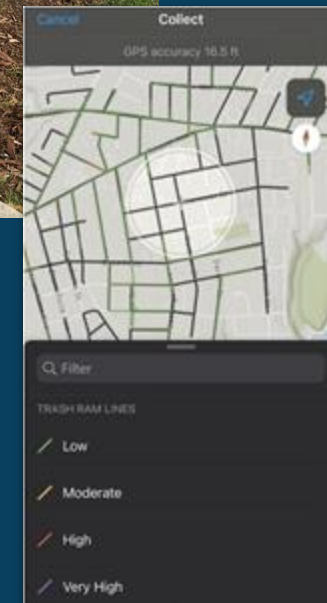
- ✓ Inspections
  - ✓ IDDE
  - ✓ Trash Assessments

- Steadily fill in any missing data as we go about our daily work

- ✓ Catch Basins
  - ✓ Culverts

- ✓ Storm Drains
  - ✓ Private BMPs
  - ✓ Pipes

- It was daunting at first, but our staff and contractors made the transition

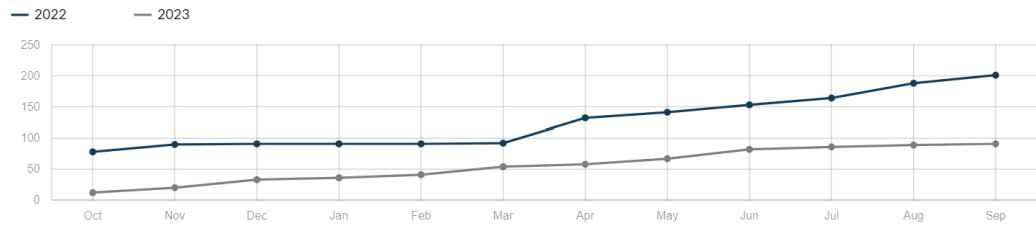


*Our partner, 2NDNATURE helped us to have...*

**a truly remarkable epiphany...**

*The data we gather to meet our MS4 compliance requirements serves as a cornerstone for unlocking countless possibilities and opportunities*

Cumulative Total # of Site Visits by Month



\*10/01/2021 is the start of the focus reporting year. 09/30/2022 is the end of the focus reporting year.

Total Debris Removed

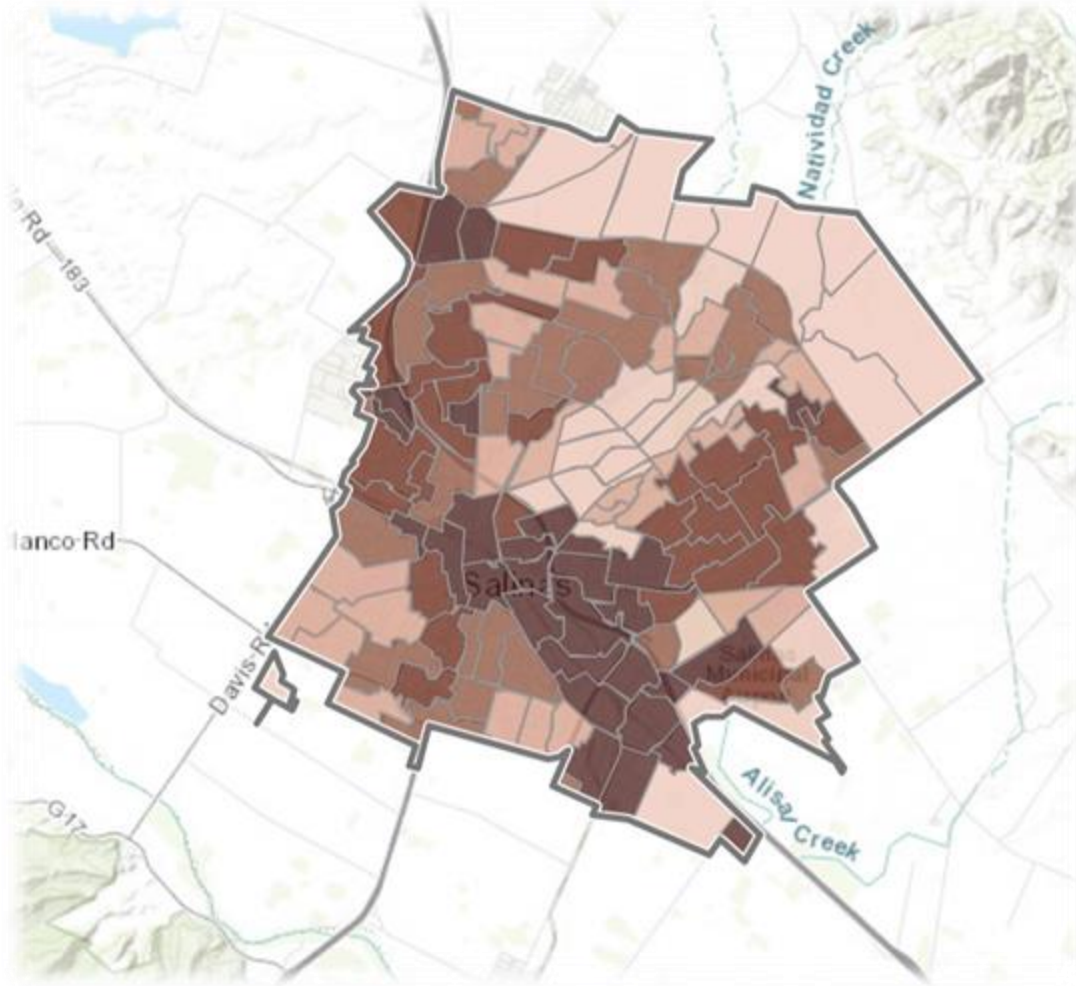


Top 5 Corrective Actions

2022		2021	
▲ Debris/Clogging	14	Structural Damage	38
▼ Structural Damage	14	Debris/Clogging	32
▬ Check Medallion/Label	1	Check Medallion/Label	13
N/A	-	Check FCS Device	2
N/A	-	Dewinterize/Thaw	1

# 2NFORM Helps Us Achieve New Operational Efficiencies

- Data visualizations allow us to track progress
- Analytics help us evaluate and adjust efforts and allocate resources more effectively
- And maps have...



water quality prioritization map

MAPS HELP US TO

# Prioritize and Concentrate Our Efforts **WHERE** They Are Most Needed

- This watershed-based approach enables us to develop highly effective strategies and tactics on a catchment-by-catchment basis
- It allows us to align water quality compliance with the multiple benefits desired by the community.



Low Impact Development



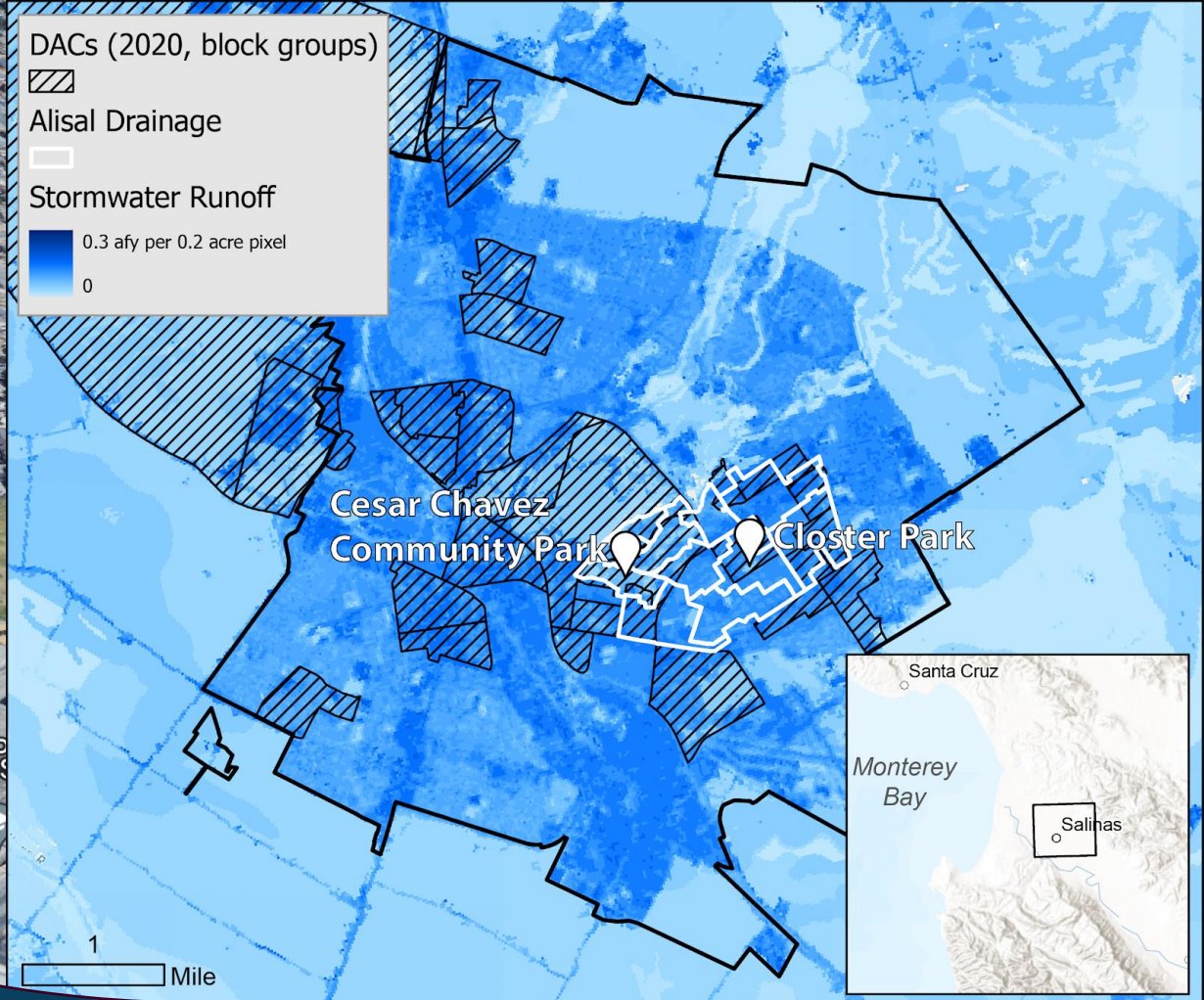
Street Sweeping



Green Stormwater Infrastructure

# We Make Strategic Investments Informed by Data & Analytics

- Focusing on initiatives that have proven to deliver multiple benefits
- Closely monitoring and tracking our progress toward TMDL goals
- Engage leadership, residents and partners



# We Are Increasing the Resiliency of Our Communities

- With an emphasis on environmental justice, focusing on our most at-risk neighborhoods

# Seeking Funding to Expand Our Efforts

State Revolving  
Funds (SRF)

Bipartisan  
Infrastructure Law

Stormwater  
Utility Fees

Water Infrastructure  
Finance and  
Investment Act

Public / Private  
Partnerships

The results and outcomes we aim for encompass the following principles:

- Derived from strategies that yield multiple benefits.
- Informed and monitored with reliable data and analytics.
- Incorporate geographical and socioeconomic factors.
- Ultimately, help us be a better steward of the environment.



Drawing that  
**“Line in the Sand”**  
was the best  
decision we ever  
made

My program used to be unknown.  
Now we are helping City leadership  
to guide our community's  
resiliency strategy

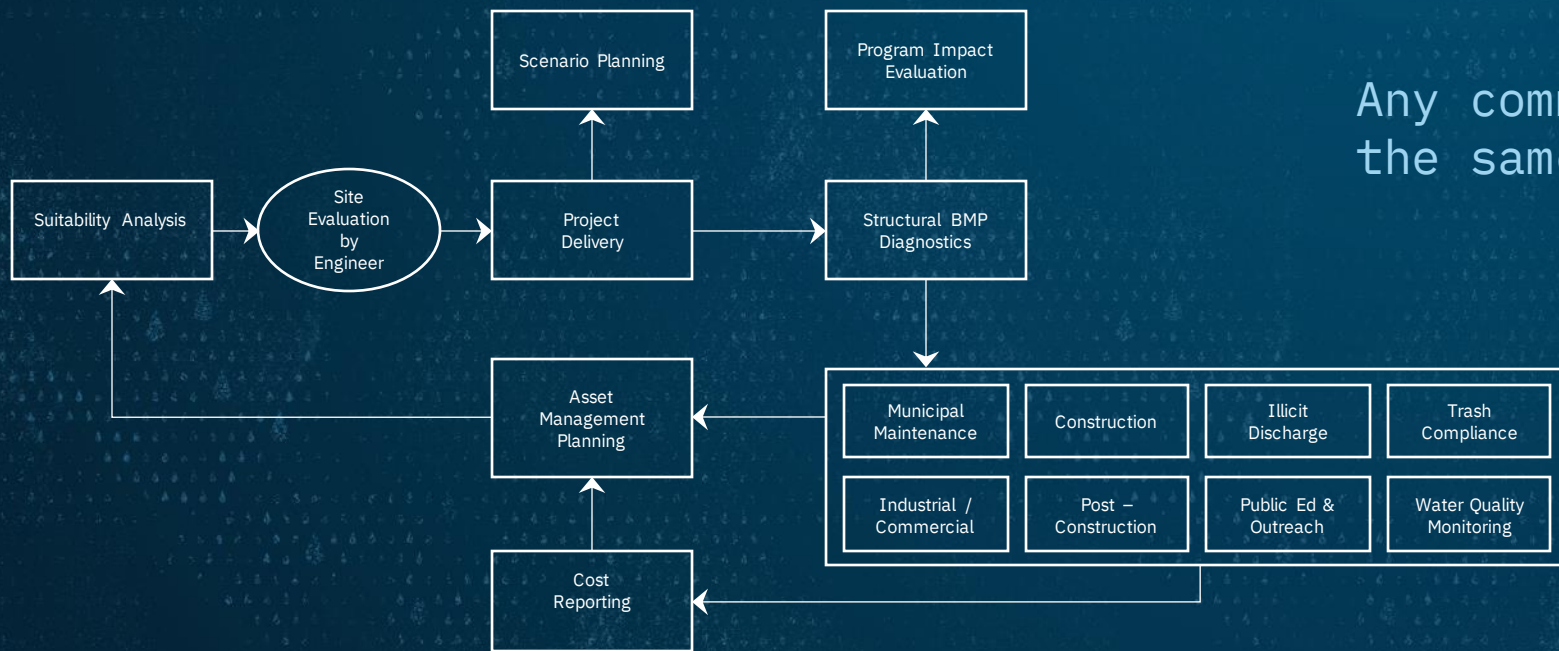


# Lessons I've Learned...

- Embrace stormwater GIS technology to enhance your program and operations
  - Adopt watershed-based planning as the foundation of stormwater management
  - Begin by utilizing existing digital data and progressively enhance it
  - Educate City leadership and the community to secure their support
  - Shift the focus from compliance to building resilience for long-term success
- 
- Draw your own “**line in the sand**” today

# The Compliance + Resilience

Enabled by GIS and Science



Any community can achieve the same as Salinas

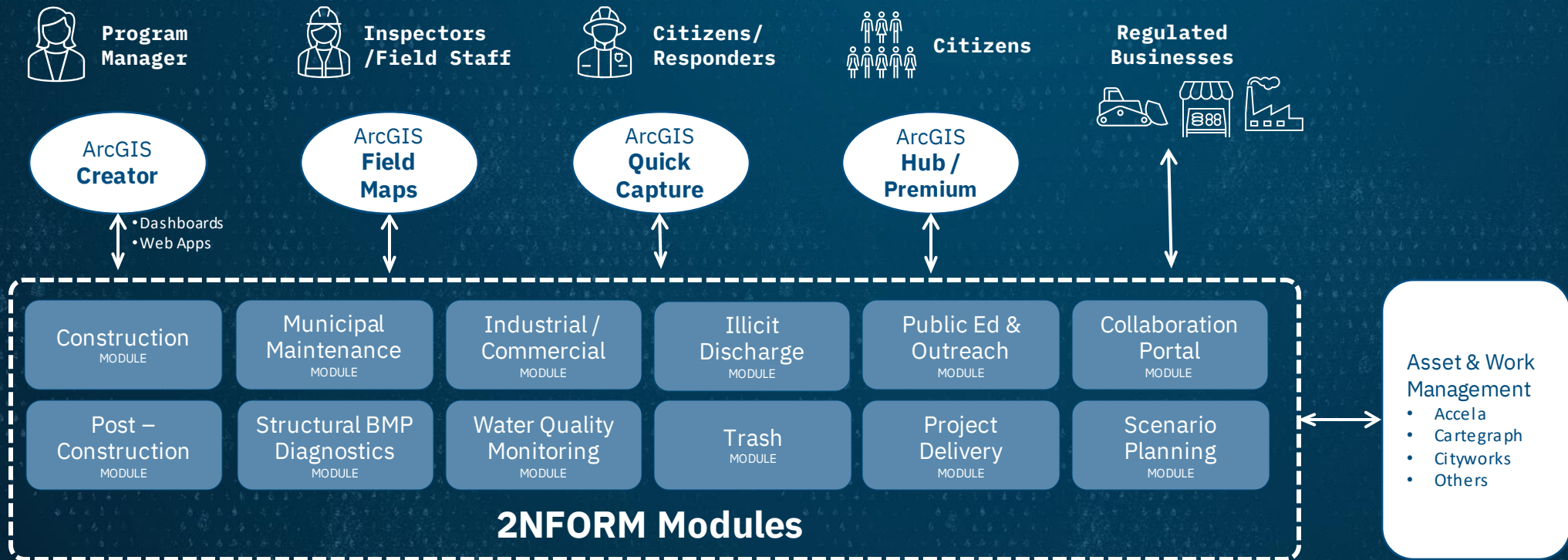
A systems-based approach providing the methods and insights to fuel better decision-making



- Start with the basics
- Advance as time and budget allow

# The Tools You Need

To lead stormwater management into the future so you can move beyond compliance



The 2NFORM platform offers a modular approach to providing capabilities essential for modern stormwater management and MS4 compliance

# Imagine if...

...every MS4 Stormwater Program was mobilized

...concentrating their efforts on compliance + resilience

...communities receive multiple benefits

**Less Pollution**  
**Less Flooding**  
**Greater Resiliency**



## Resource to Help You

- ✓ Copy of these slides
- ✓ Link to Clean Water Salinas Site
- ✓ Additional resources...

# 2NDNATURE

*Less pollution.  
Less flooding.  
Greater resiliency.*

[www.2ndnaturewater.com](http://www.2ndnaturewater.com)

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