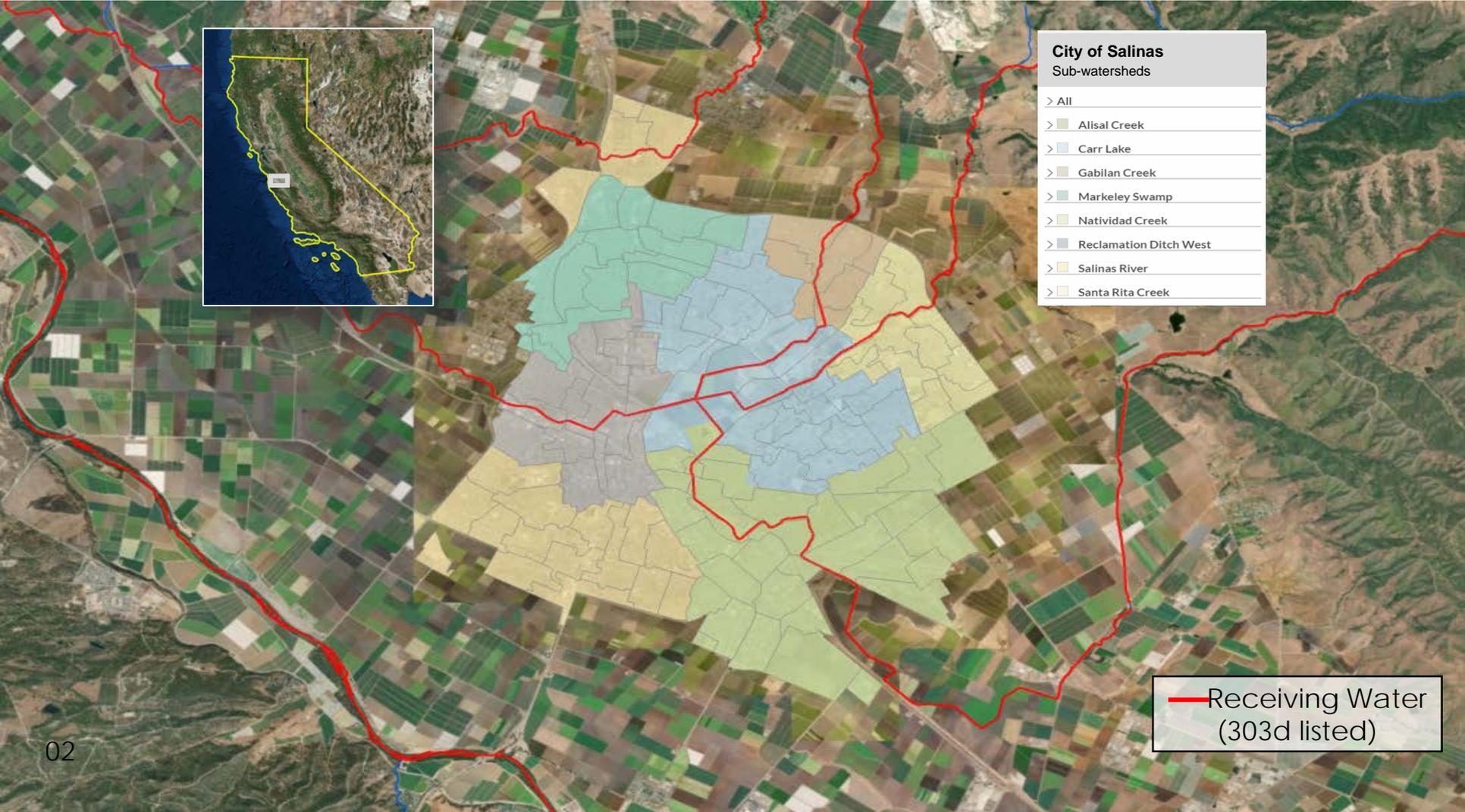


The quest to be a compliant, efficient, and cost-effective stormwater program

The evolution of stormwater management in the City of Salinas

Heidi Niggemeyer, CPSWQ
NPDES Program Manager



- City of Salinas**
Sub-watersheds
- > All
 - > Alisal Creek
 - > Carr Lake
 - > Gabilan Creek
 - > Markeley Swamp
 - > Natividad Creek
 - > Reclamation Ditch West
 - > Salinas River
 - > Santa Rita Creek

— Receiving Water
(303d listed)

Program Management *Then...*

- Program implementation fragmented and decentralized
- \$\$\$ spent to develop methods and plans that staff could not implement due to lack of knowledge
- More reports on the shelf



BMP Inspections *Then...*

- Hard-copy paper field sheets
- Manual data entry and generation of PDF documents
- Data not live and not easily analyzed



Simplified stormwater compliance to empower communities and inform change

Reporting & Planning

Quantified progress and strategic planning



SW TELR



Structural BMPs

Inspect and manage structural stormwater assets using **BMPRAM**



Illicit Discharge

Track and eliminate illicit discharges



Street Sweeping

Track pollutant control effectiveness of street sweeping programs



Industrial/Commercial

Track inspections of Industrial General Permits and commercial properties



Outfall Monitoring

Urban outfall monitoring network design, data analysis and results



Low Impact Development

Manage and track regulated development using **PARCEL RAM**



Trash

Track effectiveness of urban litter controls using **TRASHRAM**



Construction

Inspect and manage construction projects



Public Engagement

Document education and outreach activities



Receiving Water Monitoring

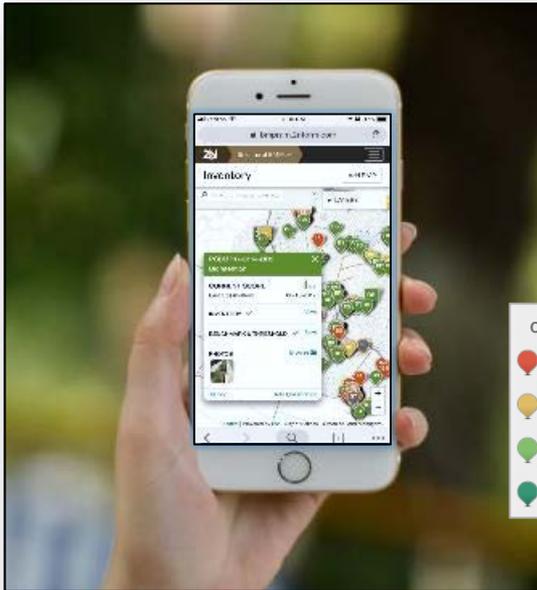
Monitoring design and data integration for TMDL reporting

US Patent Application 15/653,382 Systems and Methods for Event-based Modelling of Runoff and Pollutant Benefits of Sustainable Stormwater Management.

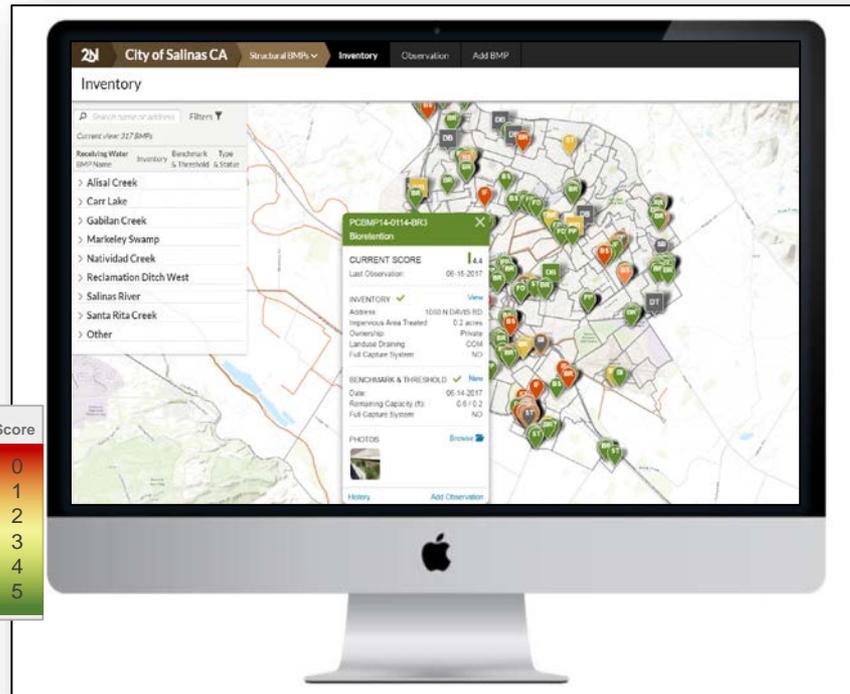


BMP Inspections *Now...*

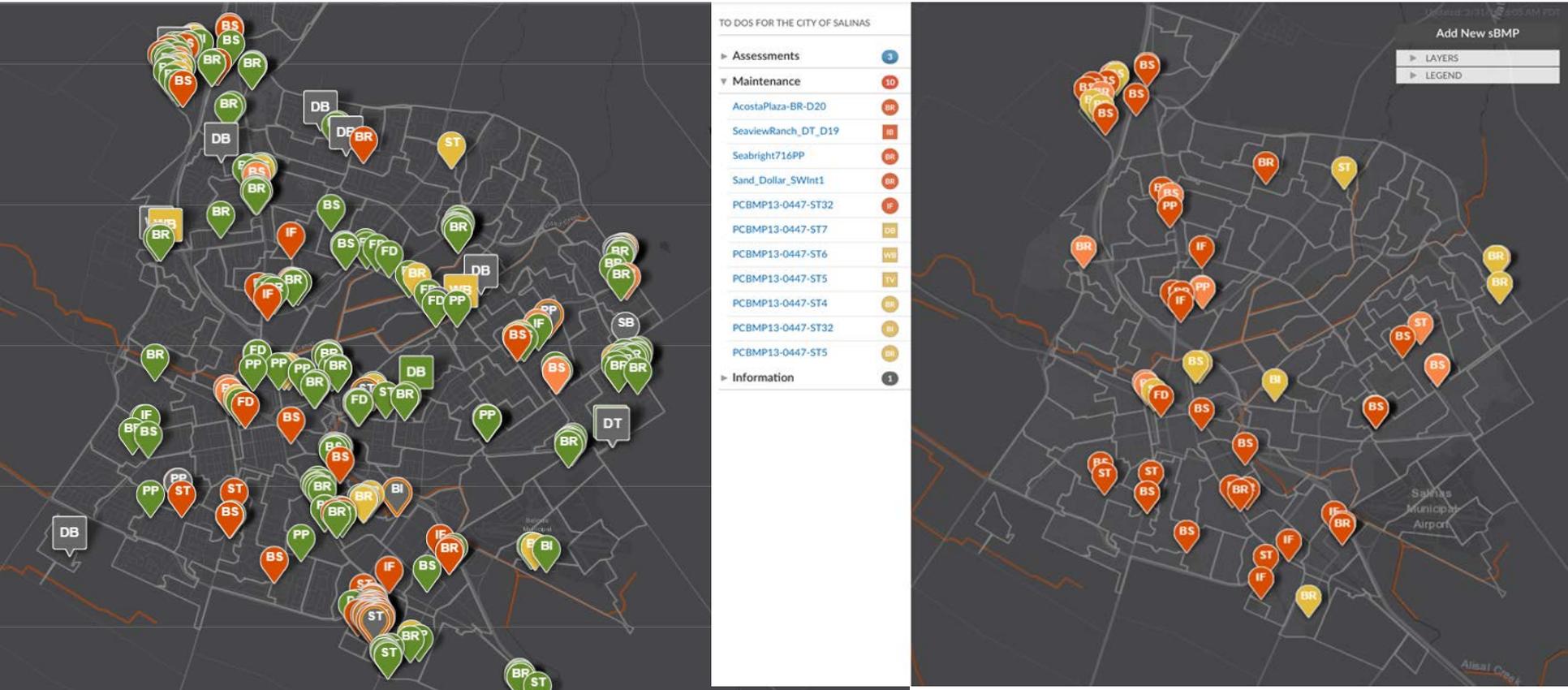
- Map-based mobile field assessments
- Synced to the desktop via cloud



Condition	Score
Poor	0
Fair	1
Acceptable	2
Desired	3
	4
	5



Over 300 structural BMPs inventoried, assessed in 6 months



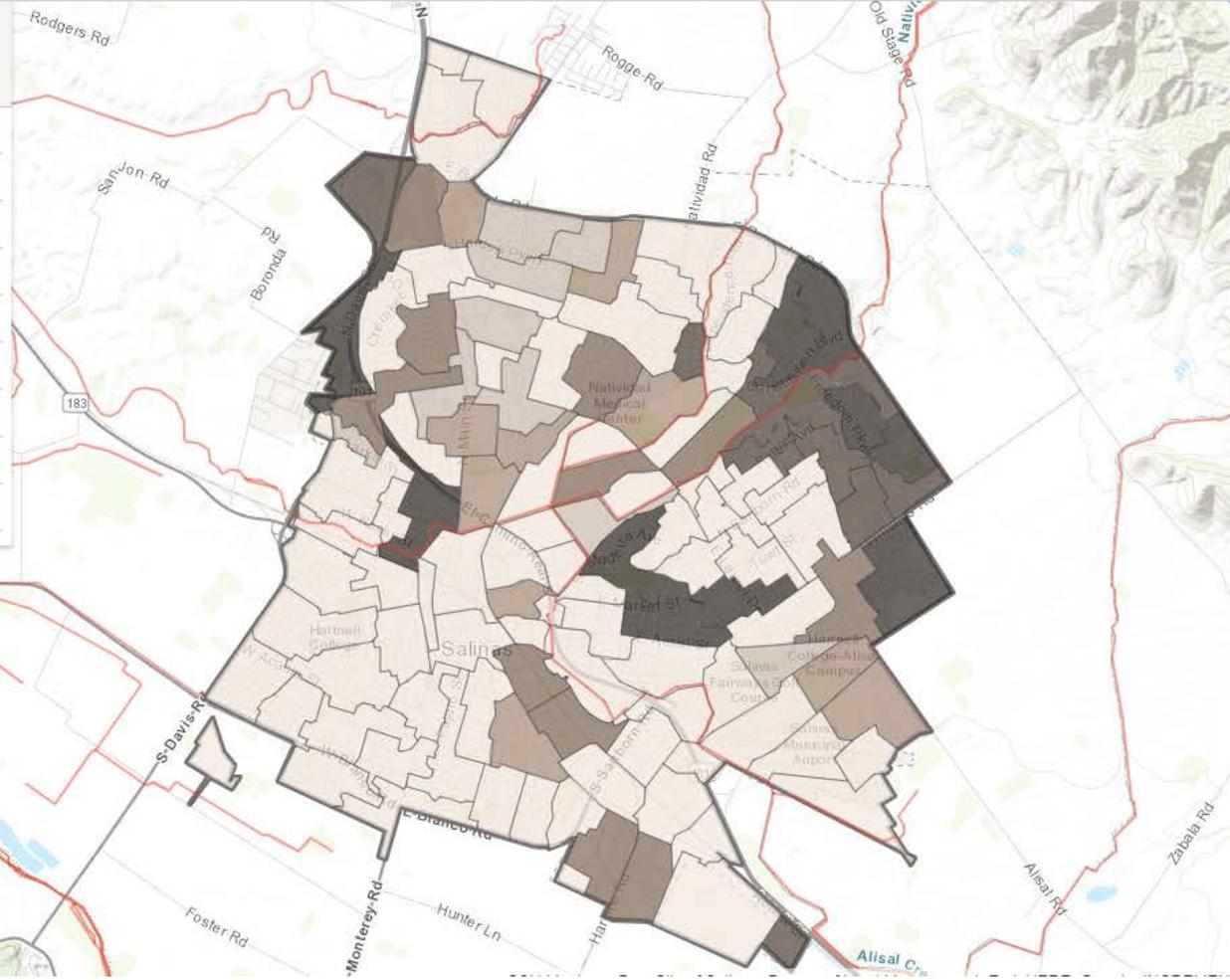
Urban Catchment Map

BASELINE
548.4ton/yr

CURRENT
516.7ton/yr

REDUCTION
31.6ton/yr (6%)

- Search for Catchments Filters ▾
- | Name | Diff ton/yr | Rate ton/ac/yr |
|--------------------------|-------------|----------------|
| > All | | |
| > Alisal Creek | | |
| > Carr Lake | | |
| > Gabilan Creek | | |
| > Markeley Swamp | | |
| > Natividad Creek | | |
| > Reclamation Ditch West | | |
| > Salinas River | | |
| > Santa Rita Creek | | |



LAYERS

- Particulate
- Discharge Points
- Streams
- MS4 Boundary
- Storm Drains

Topographic ▾

LEGEND

Particulate Reduction (ton/yr)

- 0.0
- 0.0-0.010
- 0.010-0.028
- 0.028-0.108
- 0.108-1.173
- > 1.173

Streams

- Receiving water
- Receiving (303d)
- MS4 Boundary

08

Lincoln Park
Watkins Gate Rd
Addington Rd
Henri



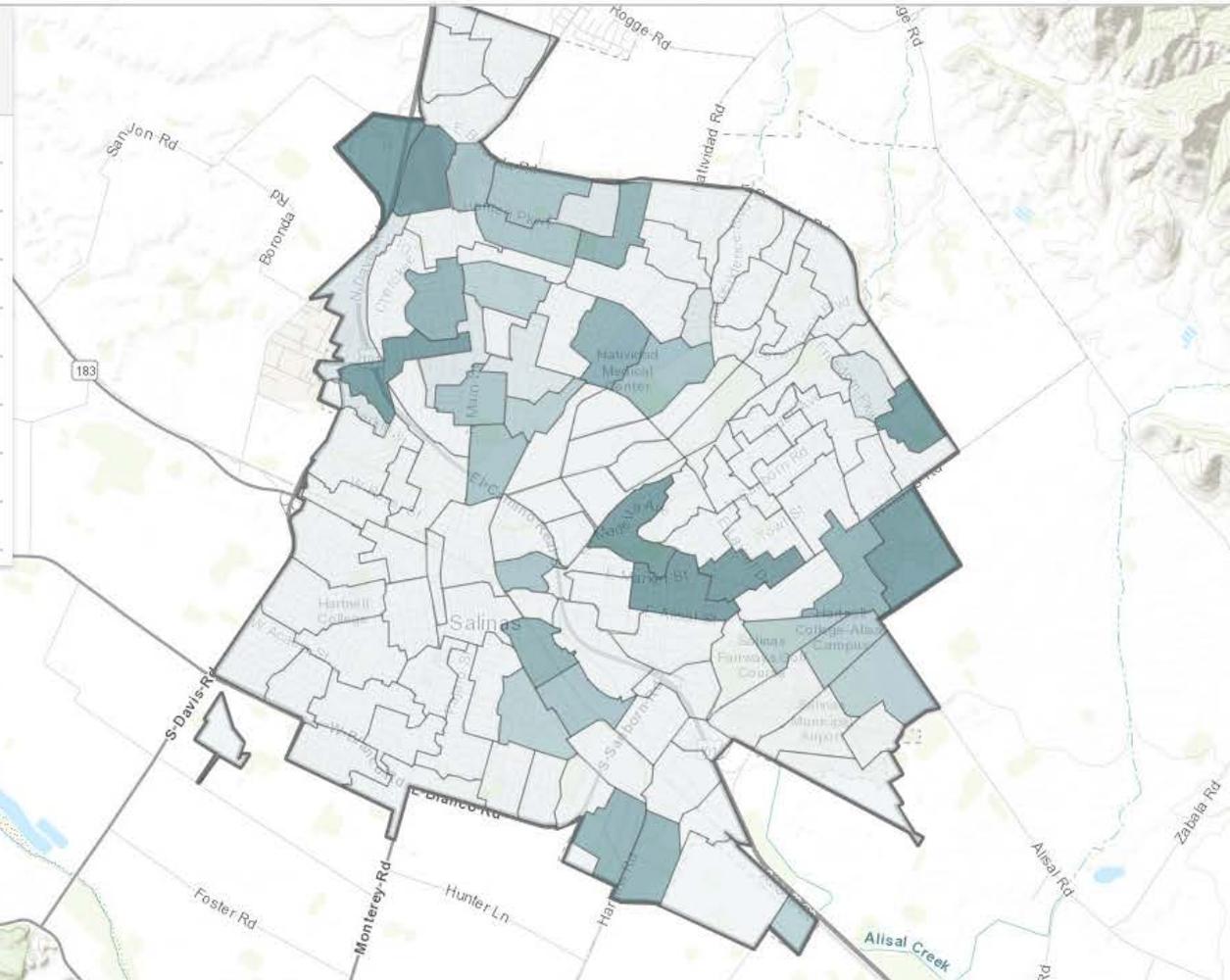
Urban Catchment Map

BASELINE
4,938.1afy

CURRENT
4,830.1afy

REDUCTION
108.0afy (2%)

- Search for Catchments Filters
- | Name | Diff afy | Rate ft/yr |
|--------------------------|----------|------------|
| > All | | |
| > Alisal Creek | | |
| > Carr Lake | | |
| > Gabilan Creek | | |
| > Markeley Swamp | | |
| > Natividad Creek | | |
| > Reclamation Ditch West | | |
| > Salinas River | | |
| > Santa Rita Creek | | |



LAYERS

- Runoff
- Discharge Points
- Streams
- MS4 Boundary
- Storm Drains

Topographic

LEGEND

Runoff Reduction (afy)

- 0.0
- 0.0-0.02
- 0.02-0.23
- 0.23-0.32
- 0.32-0.84
- > 0.84

Streams

- Receiving water
- Receiving (303d)
- MS4 Boundary



Information Management *Now...*

- Geospatial project tracking
- Link projects to existing or new structural BMPs (parcel-scale)
- Track LID features, design specs & performance standards, O&M agreements, and Maintenance Declarations

New LID Project

1. SELECT PARCELS > 2. SELECT BMPs > 3. ADD DETAILS > 4. CONFIRM

ID

Enter Project ID

New Development Redevelopment

Start Date

Select Date

Field Verification Date

Select Date

O&M Approval Date

Select Date

Completed Date

Select Date

LID Project Design

Impervious Surface Area (sq-ft)

so ft

Performance Requirements

Exempt IWQ Treatment Peak Management

Site Design Runoff Retention

Special Circumstances

No

Alternative Compliance

No

Off-site Mitigation

Associated Project

--

Owner Contact Information

First and last name

Street 1

Street 2

Email

City

Phone

CA

Zip Code

OSM Information

First and last name

Street 1

Street 2

Email

City

Phone

CA

Zip Code

Notes

Optional

Attach files

Drag & Drop or Browse

Back Cancel

file uploads limit 2MB Next



Simplified Runoff and Pollutant Model

2016 Baseline Loads

- No BMPs (structural or non-structural)
- Identify high loading areas



Pollutant Loading

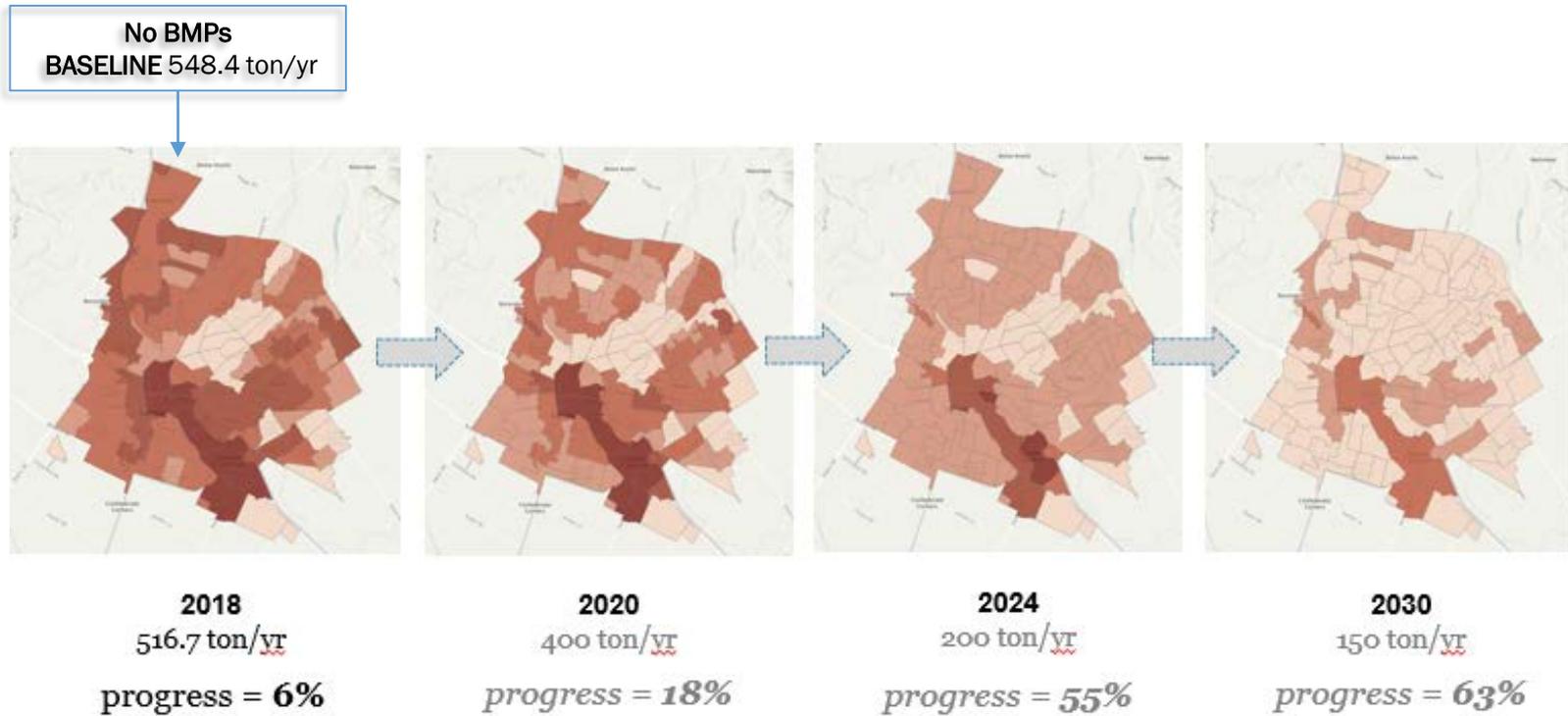


2018 Loads

- Structural BMPs and effectiveness
- Non structural BMPs
 - Street Sweeping
 - LID Projects
 - Impervious Surface Disconnection

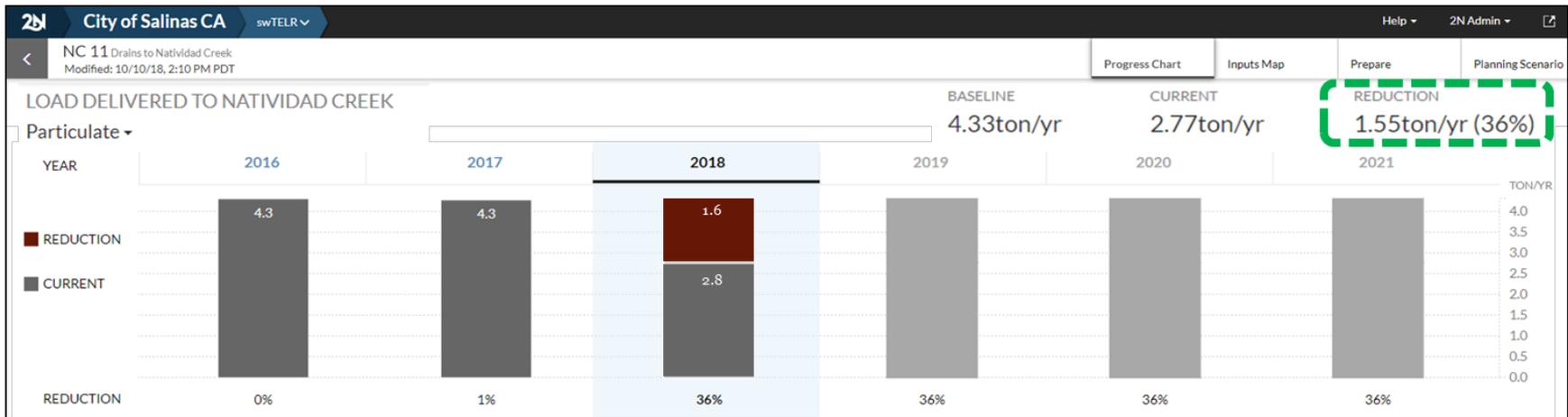


Performance-Based Stormwater Program



Stormwater Program Effectiveness Assessment

- Quantified annual runoff and pollutant load reductions
- Project planning scenario utilization
- Transparent progress tracking and online reporting





2018 Trash

Total PLU
6,536 ac

Treated PLU
1,949 ac(30%)

Progress Map

View: Urban Trash

Sort: Receiving Water

- > All MS4
- > Santa Rita Creek
- > Salinas River
- > Reclamation Ditch West
- > Natividad Creek
- > Markeley Swamp
- > Gabilan Creek
- > Carr Lake
- > Alisal Creek

Urban Trash Progress City of Salinas CA - 2018

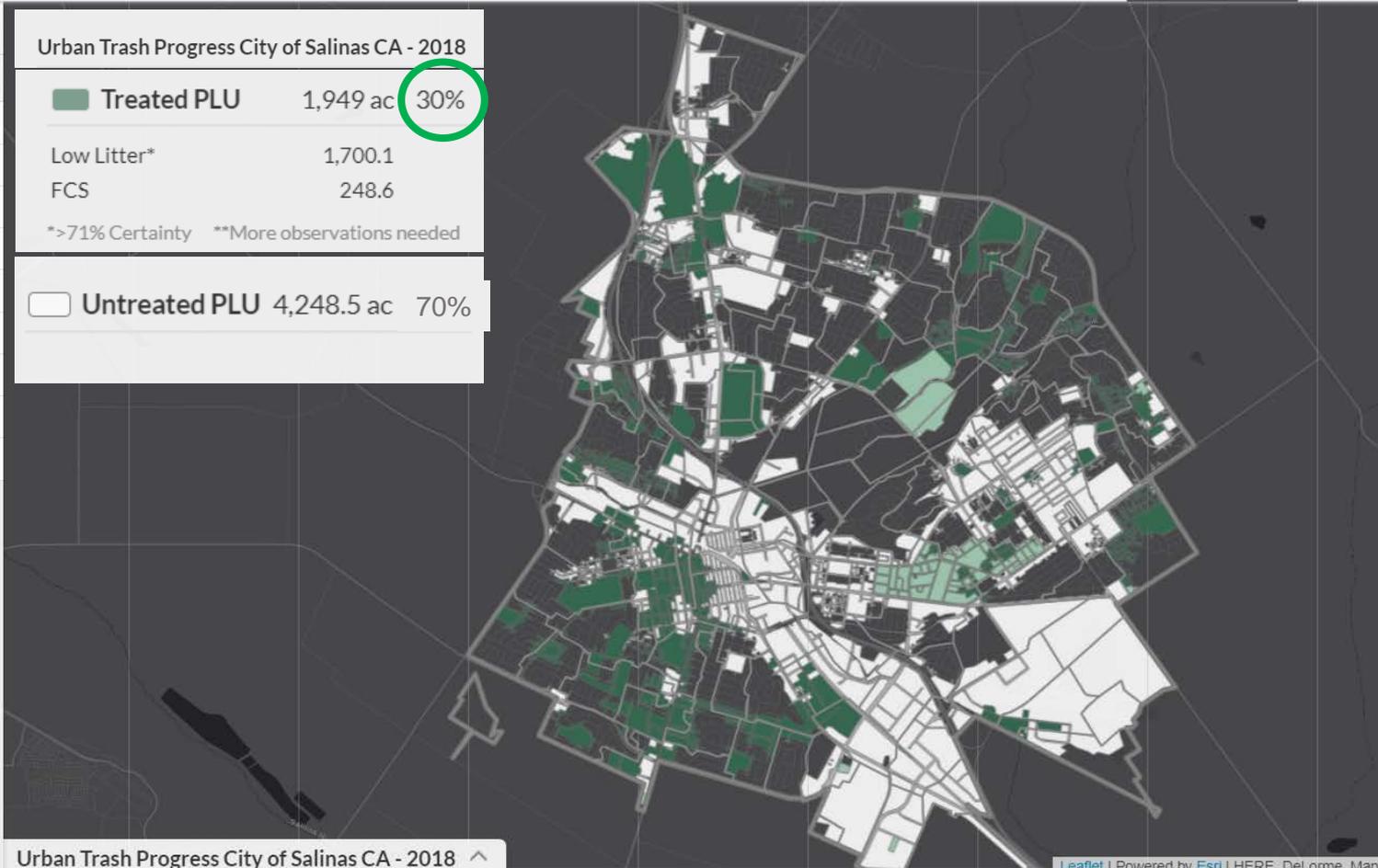
Treated PLU 1,949 ac 30%

Low Litter* 1,700.1

FCS 248.6

*>71% Certainty **More observations needed

Untreated PLU 4,248.5 ac 70%



Quantified Program Effectiveness City of Salinas

trash progress 30% reduction



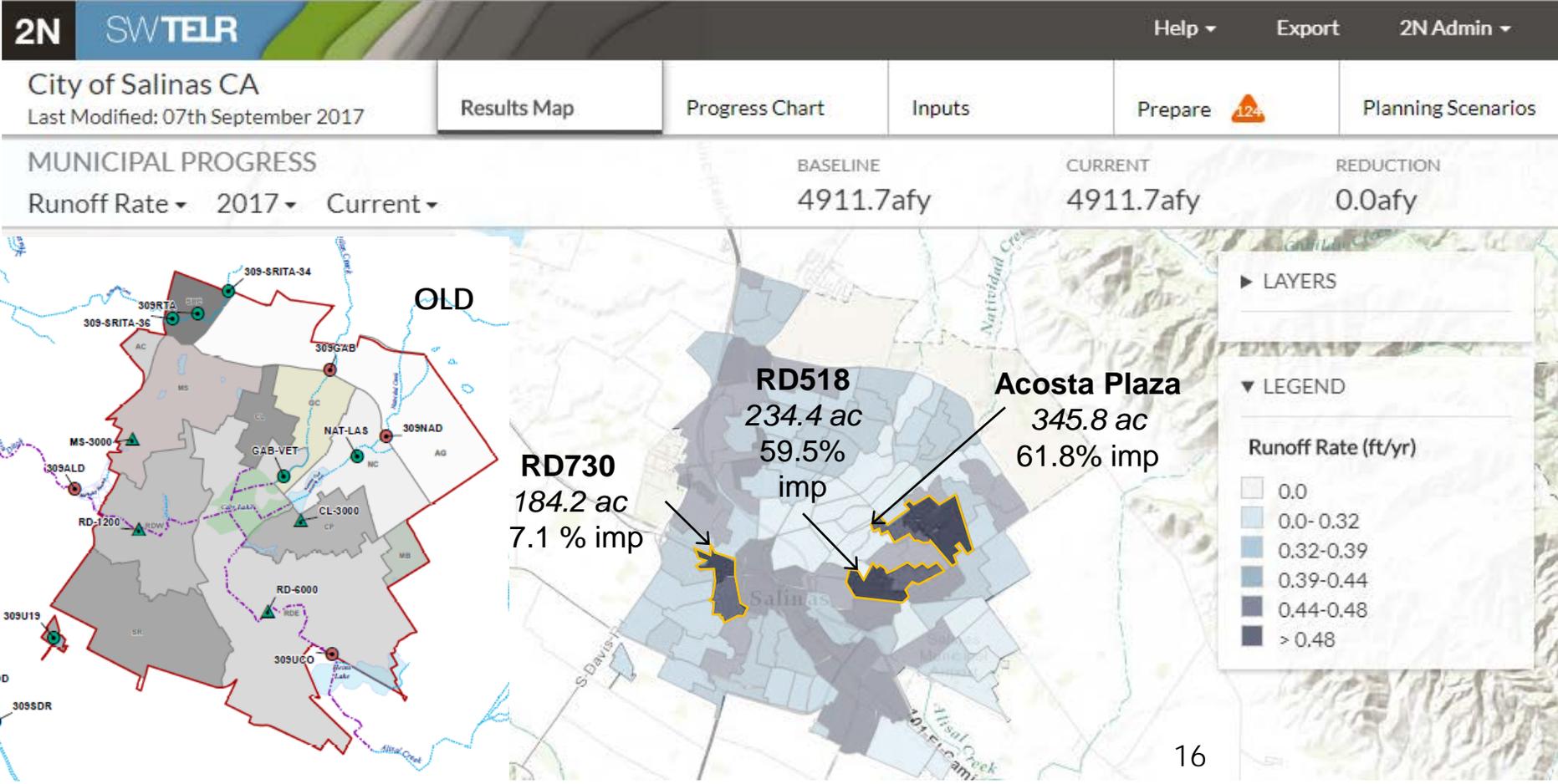
Markeley Swamp

Total Drainage Area	1,341.3 ac
Total PLU	719.8 ac
<input checked="" type="checkbox"/> Treated PLU	300 ac 42%
Low Litter*	254.8
FCS	45.6
*>71% Certainty **More observations needed	
<input type="checkbox"/> Untreated PLU	419.8 ac 58%

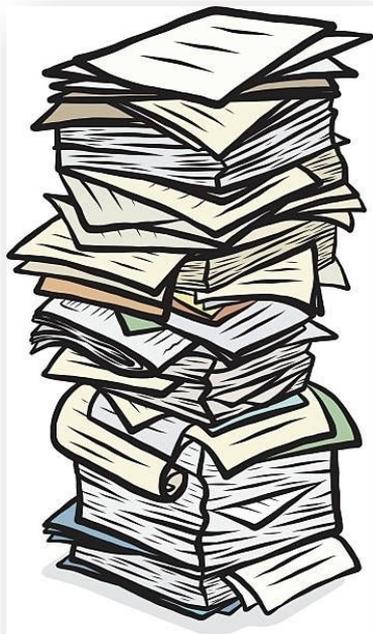
Where should we consider new FCS?



Smarter Water Quality Monitoring Program (outfall-based)



Annual Reporting *Then...*



FY16/17 and FY 17/18

- 2,000 – 3,000 pg PDF
- 3 months and 10 staff to compile
- >1,000 staff hours

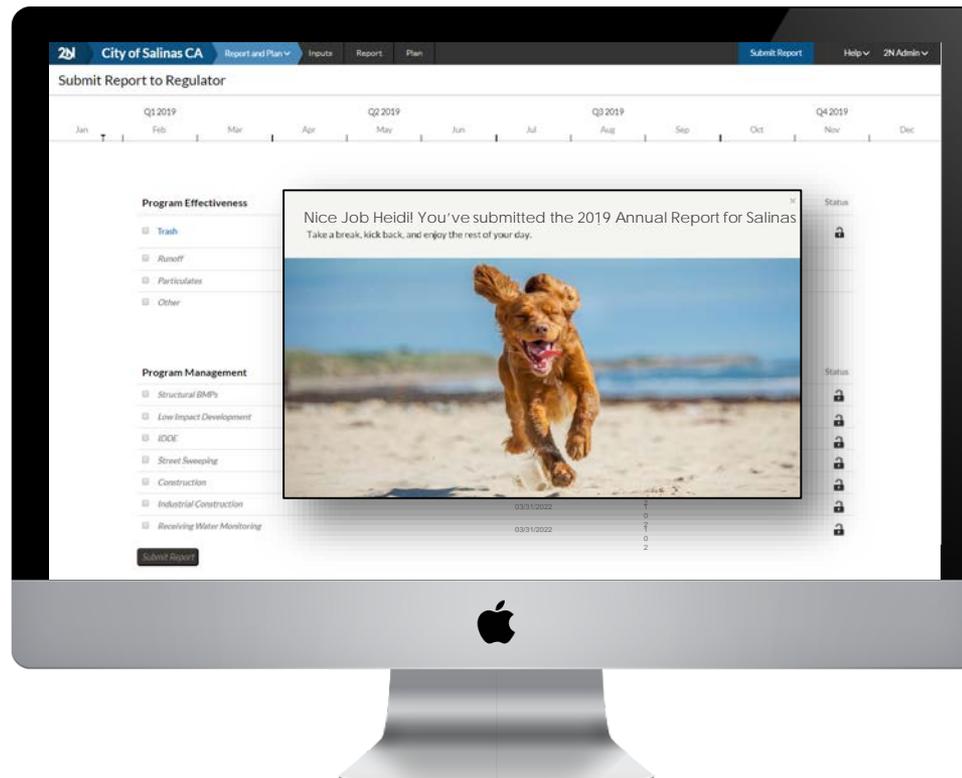
Annual Stormwater Report 2017 - 2018

-  **Final FY 2017-18 Annual Report - Body Only** (7.15 MB)
-  **Appendix E-Municipal Maintenance** (42.26 MB)
-  **Appendix F-Commercial And Industrial** (16.38 MB)
-  **Appendix G-Residential** (2.5 MB)
-  **Appendix H-Illicit Discharge Detection And Elimination** (49.45 MB)
-  **Appendix J-Parcel Scale Development** (2.02 MB)
-  **Appendix K-Construction Management** (20.01 MB)
-  **Appendix M-Public Education And Public Involvement** (918.02 KB)
-  **Appendix N-Trash Load Reduction** (12.93 MB)
-  **Appendix O TMDLS** (27.15 MB)
-  **Appendix P-Monitoring Effectiveness Assessment And Program Improvement** (4.66 MB)
-  **Appendix S-Legal Authority** (291.62 KB)

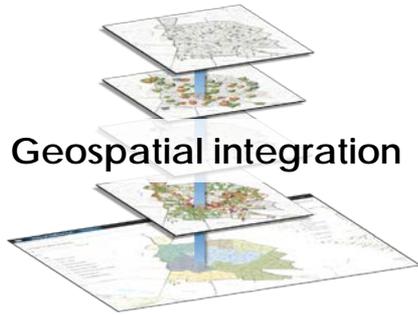
"Our annual report is where data goes to die"

Annual Reporting *Soon...*

Digital Reporting - *Save paper, time and regulatory uncertainty*



Salinas Stormwater Program *Now...*



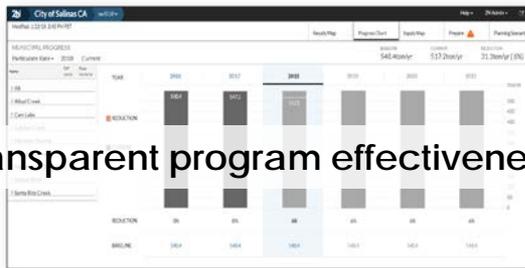
Geospatial integration



Efficiently collect better data



Automatic data to information



Transparent program effectiveness



Improved regulatory relationship