Science and Engagement Drive Sarasota Bay Watershed Management

June 25, 2021

Speakers

Robert Laura, PE
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Kelly Westover, PMP, CFM
Stantec

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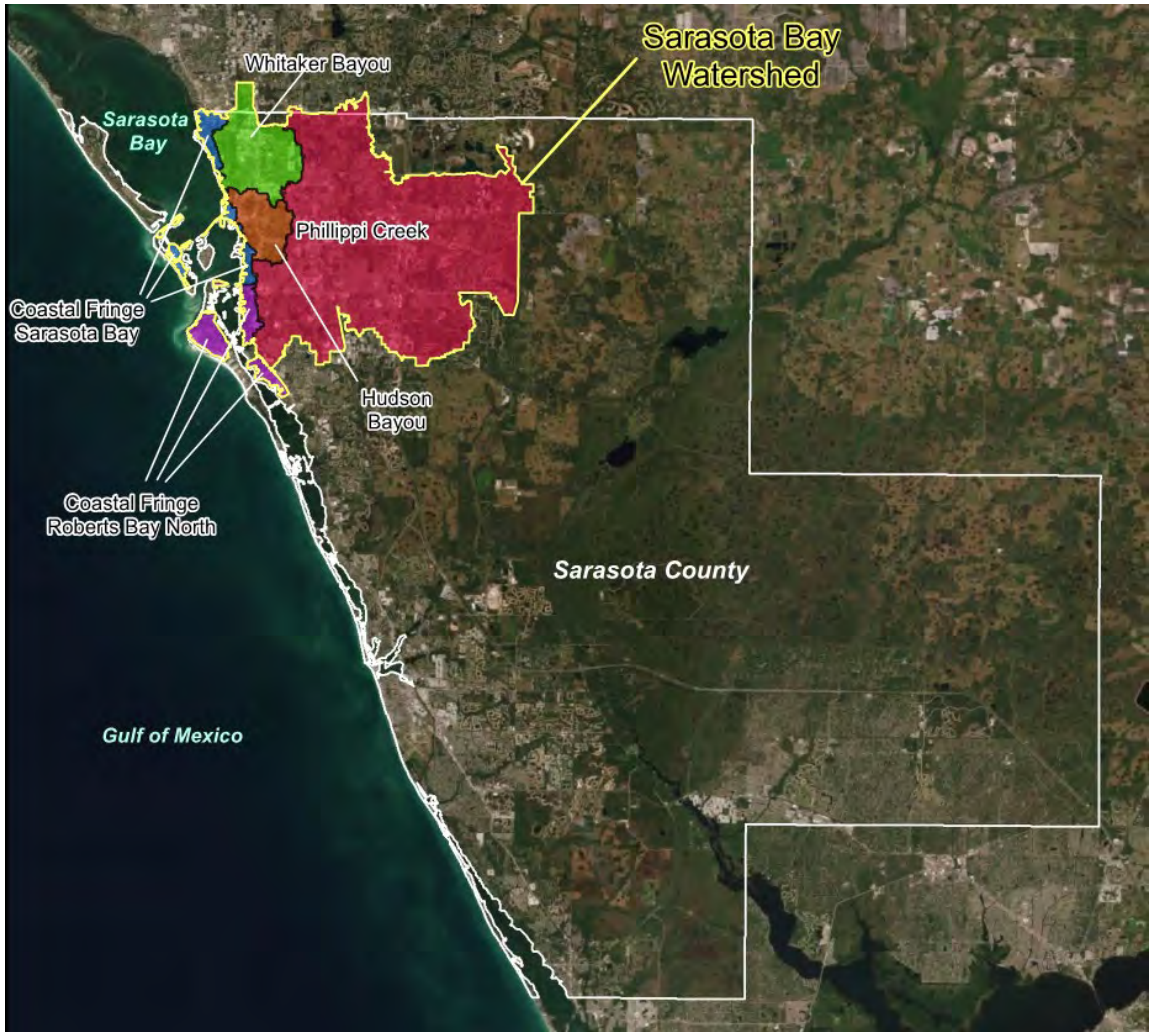
Stantec

Tony Janicki, PhD
Janicki Environmental


Sarasota
County


Whitaker Bayou
Sarasota Bay Watershed
Sarasota Bay
Phillippi Creek
Coastal Fringe Sarasota Bay
Hudson Bayou
Coastal Fringe Roberts Bay North
Sarasota County
Gulf of Mexico

Key Issues

- Flooding
- Impaired waterbodies
- Reclaimed water
- How to pay for projects?

Project Team

Sponsors

Sarasota County

Southwest Florida Water Management District
WATERMATTERS.ORG · 1-800-423-1476

Consultants

Stantec

Watershed Management Services, LLC

Janicki Environmental, Inc.

SHAFER consulting

Partners

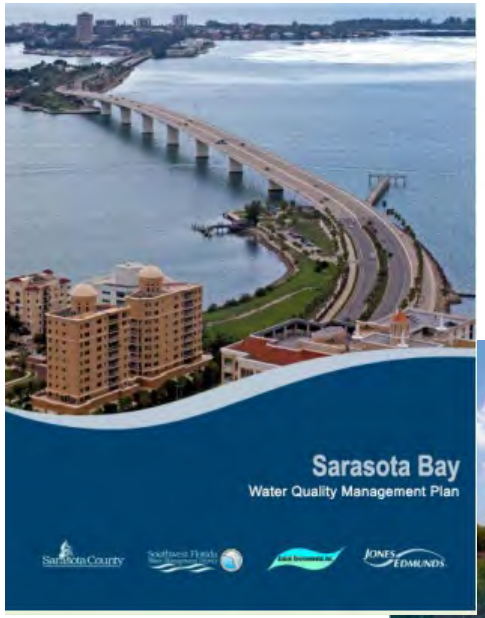
Restoring Our Bays
SARASOTA BAY ESTUARY PROGRAM
www.sarasotabay.org

Longboat Key Incorporated 1539 to 1955 Florida

City of Sarasota

History with the Sarasota Bay Watershed

- Previous Watershed Plans
- Recommendations were implemented
- Conditions have changed



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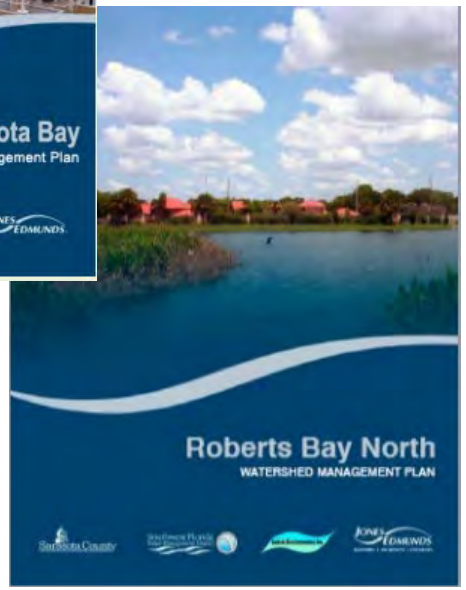

Southwest Florida
Water Management District
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Project Overview

Objective

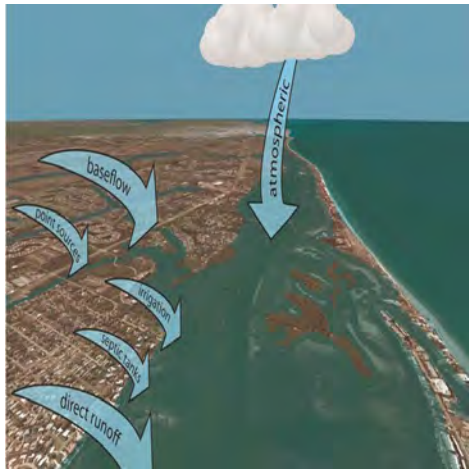
Improve the health of the Sarasota Bay Watershed

How?

- **Perform flood & water quality analysis**
- **Identify menu of projects**
- **Educate, engage & elicit feedback from sophisticated stakeholders**
- **Develop a funding strategy**

Flood Protection

Minimize flood risk while protecting the floodplain



Water Quality

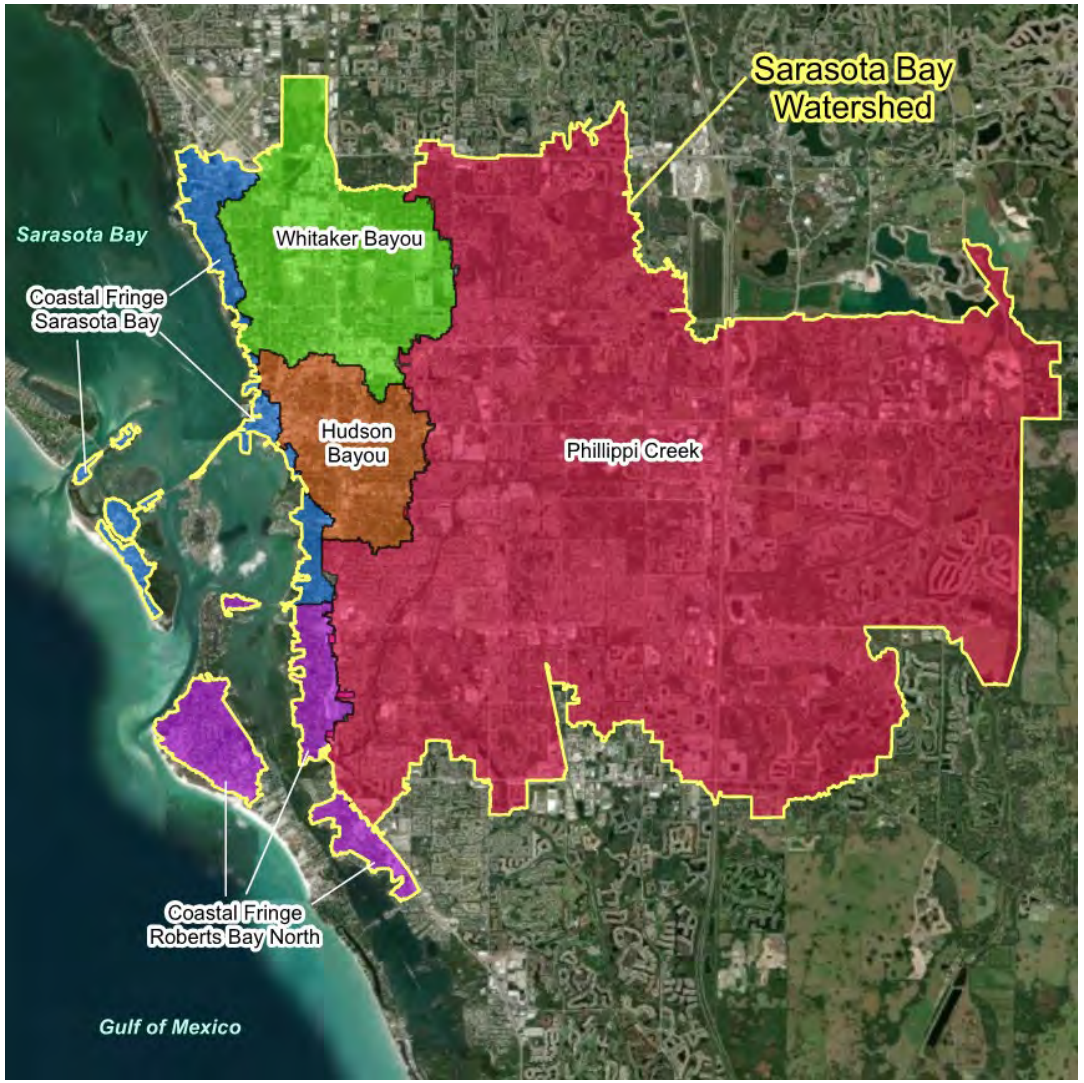
Improve water quality in the Sarasota Bay watershed

Natural Systems

Restore natural habitats

Project Roadmap

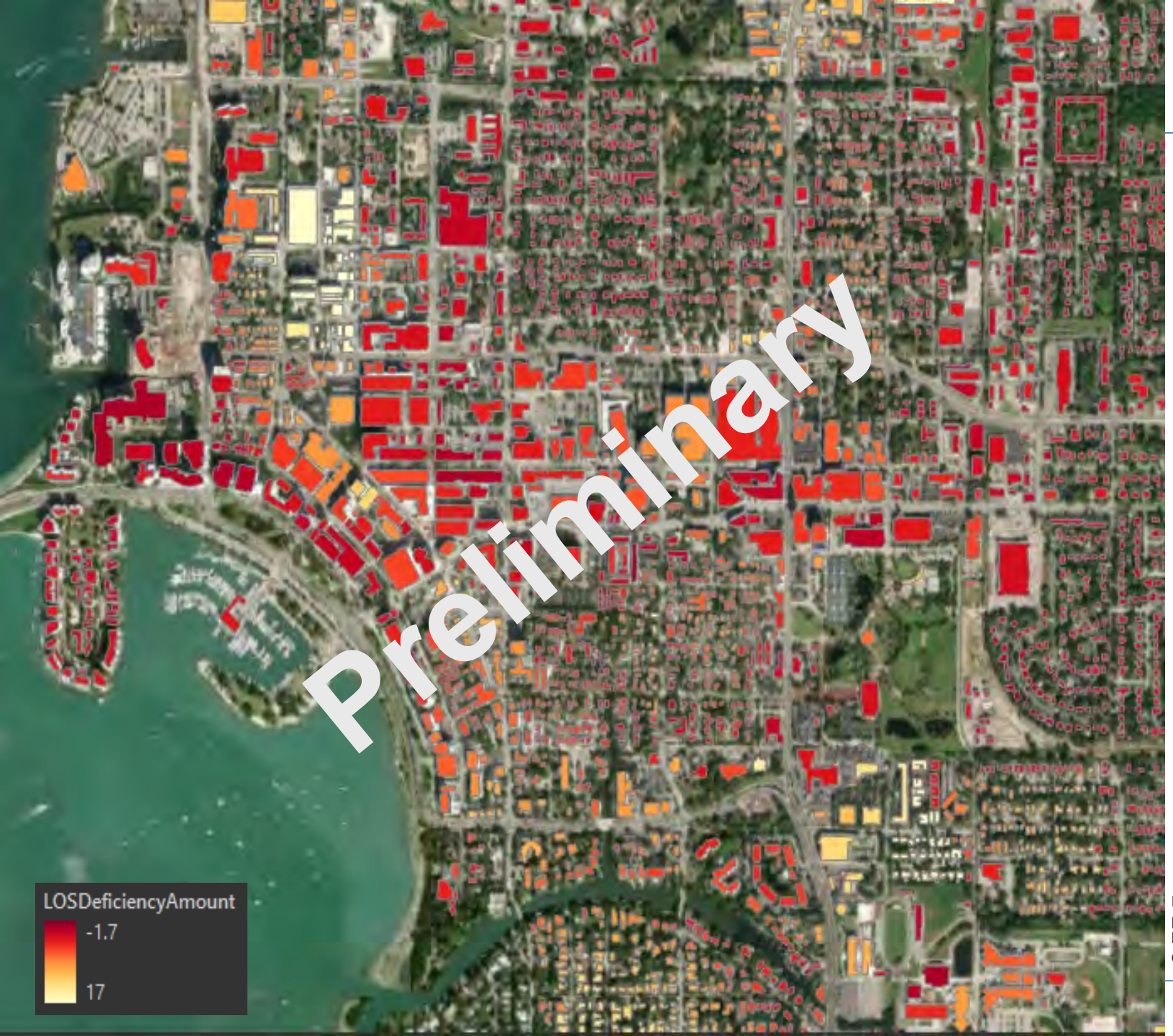
Flood Protection Level of Service Analysis



Flood Level of Service Analysis

- Objective: Determine floodplain level of service (LOS) deficiencies.
- Migrated ICPR version 3 flood models to ICPR version 4.
- Calibrated models using recent significant rainfall event.

County LOS Graphic



Sources for LOS Deficiency Analysis

- Previous studies & reports
- Repetitive Loss Area Analysis
- Structure Flooding Deficiencies
- Roadway Flooding Deficiencies

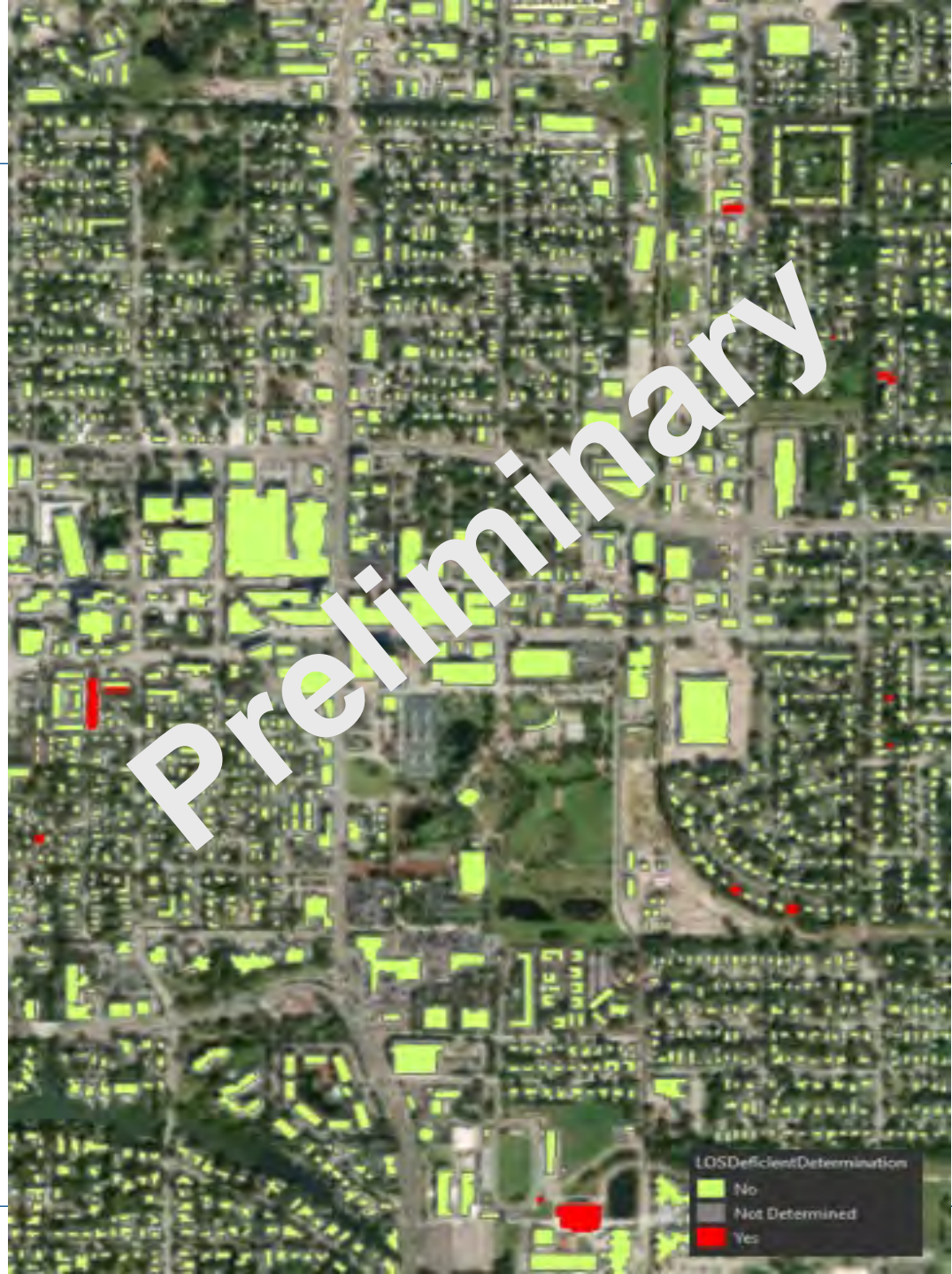
Disclaimer: Results presented are preliminary and are based on compilation of general, publicly available information. Data, as presented, is not intended, nor shall be used for location- or parcel-specific analysis (i.e. survey, inspection, flood zone determination, risk or other analysis)

Sarasota Bay Watershed
Flood and Water Quality Improvements

Structure Flooding Level of Service

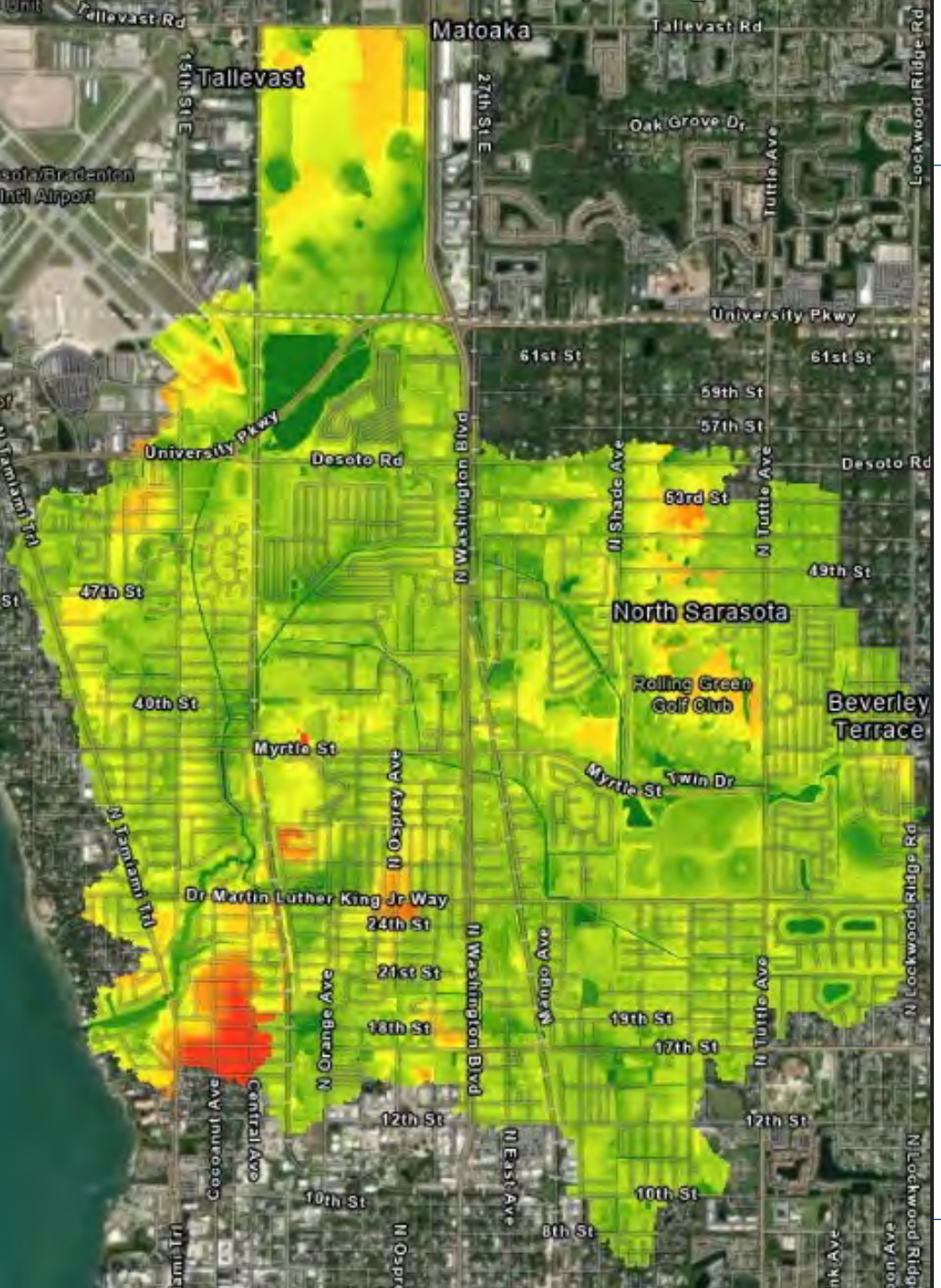
- Calculated Finished Floor Elevation (FFE): DEM derived base elevation +1 foot for structures, and +2 foot for mobile or manufactured homes

- Calculated Structure Flooding LOS Deficiency: Where the estimated building FFE is lower than the peak stage, or base flood elevation (BFE), for the 100-year storm event.



Basin	Total Structures	Deficient Structures	% Structures that are Deficient	Deficient Structures Built On or After 2009
Coastal Fringe Roberts Bay North	4,710	35	0.74%	1
Coastal Fringe Sarasota Bay	3,156	5	0.16%	2
Hudson Bayou	5,495	26	0.47%	2
Whitaker Bayou	9,161	162	1.77%	7
Philippi Creek	52,603	567	1.08%	167
Totals	**75,125**	**795**	**1.06%**	**179**

Structure Level of Service Deficiency Area Ranking



Roadway Flooding Level of Service

Pool Grid is created by subtracting the Catchment Grid from the Sarasota County 2007 DEM.

- Evacuation Pool Grid: All elevation values less than 0’
- Arterial Pool Grid: All elevation values less than -0.5’
- Collector Pool Grid: All elevation values less than -0.75’
- Local Pool Grid: All elevation values less than -1’

Whitaker Bayou Pool Grid Output Example

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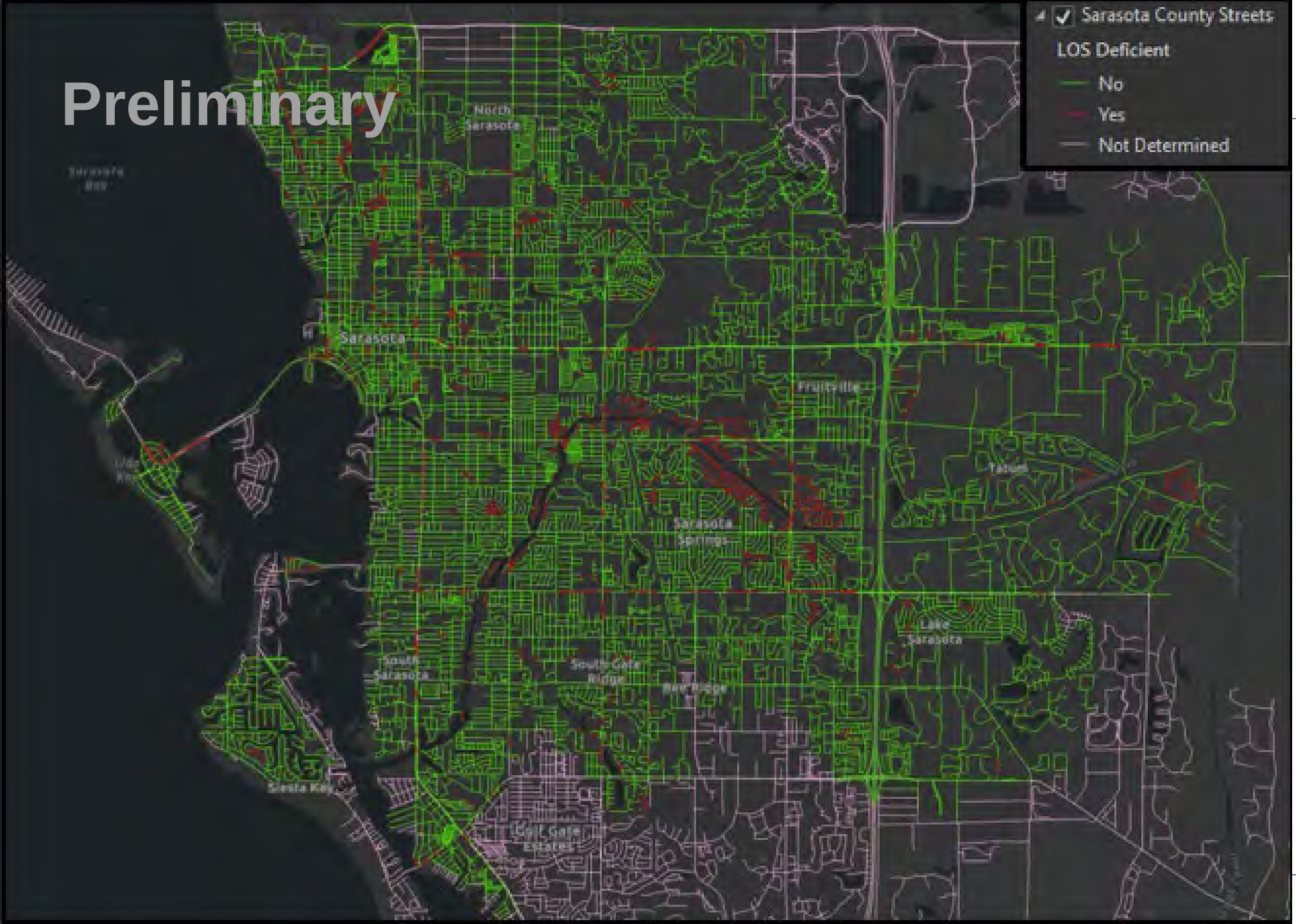
Preliminary



Roadway Level of Service Deficiencies

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Roadway Level of Service Deficiency Summary

LOS Type	LOS Deficient	Linear Feet	Percent
Evacuation	No	372,765	80%
	Yes	93,008	20%
Arterial	No	297,662	91%
	Yes	30,042	9%
Collector	No	137,230	98%
	Yes	3,012	2%
Local	No	4,295,481	94%
	Yes	257,030	6%

Water Quality Assessment

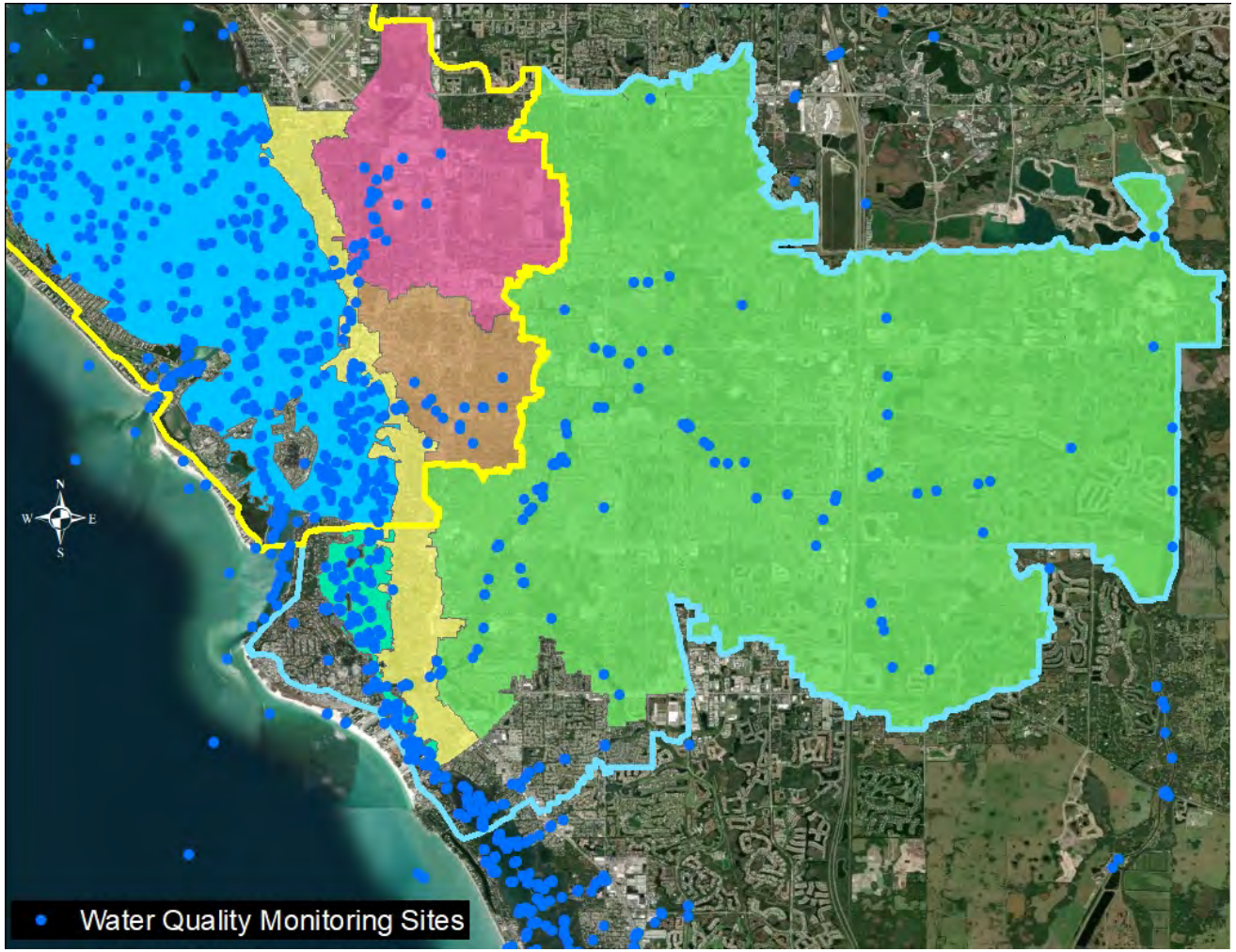
Janicki Environmental, Inc.

Sarasota Bay Surface Water Resource Assessment (SWRA)

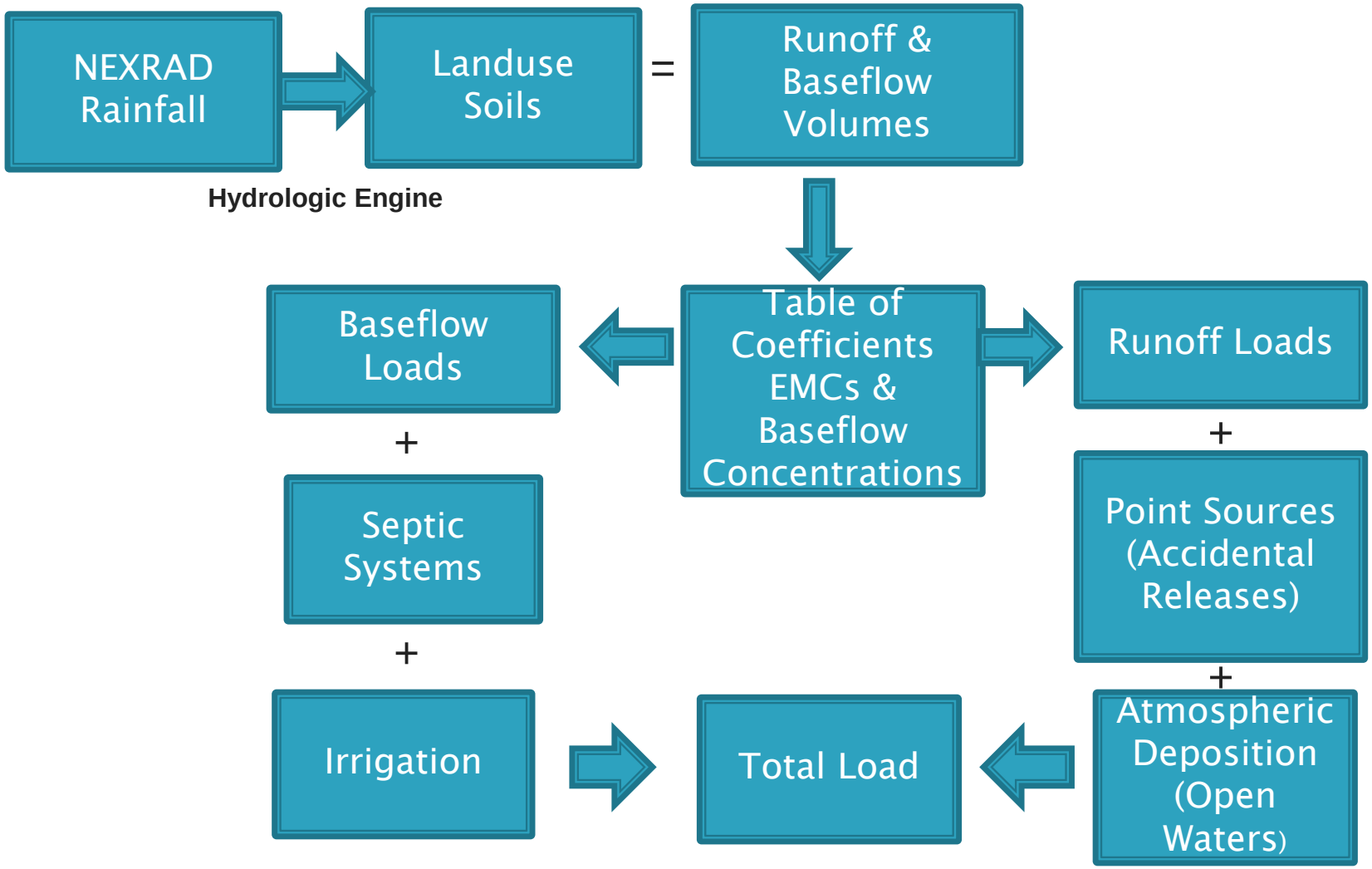
OBJECTIVE

Utilize available water quality related information found in models and reports along with current data analysis and conditions to identify the most appropriate BMPs to address water quality issues throughout the watershed.

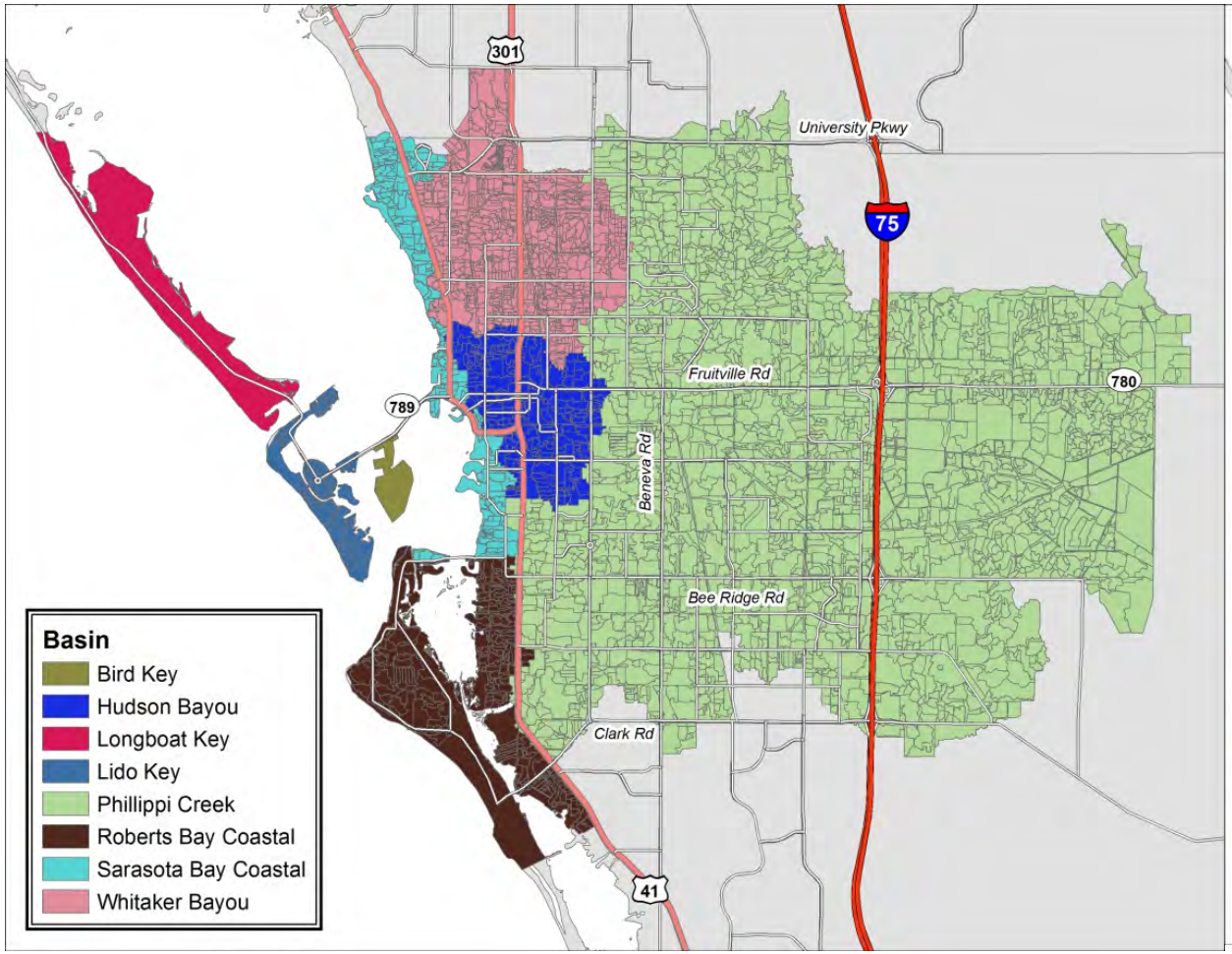
Water Quality Analysis



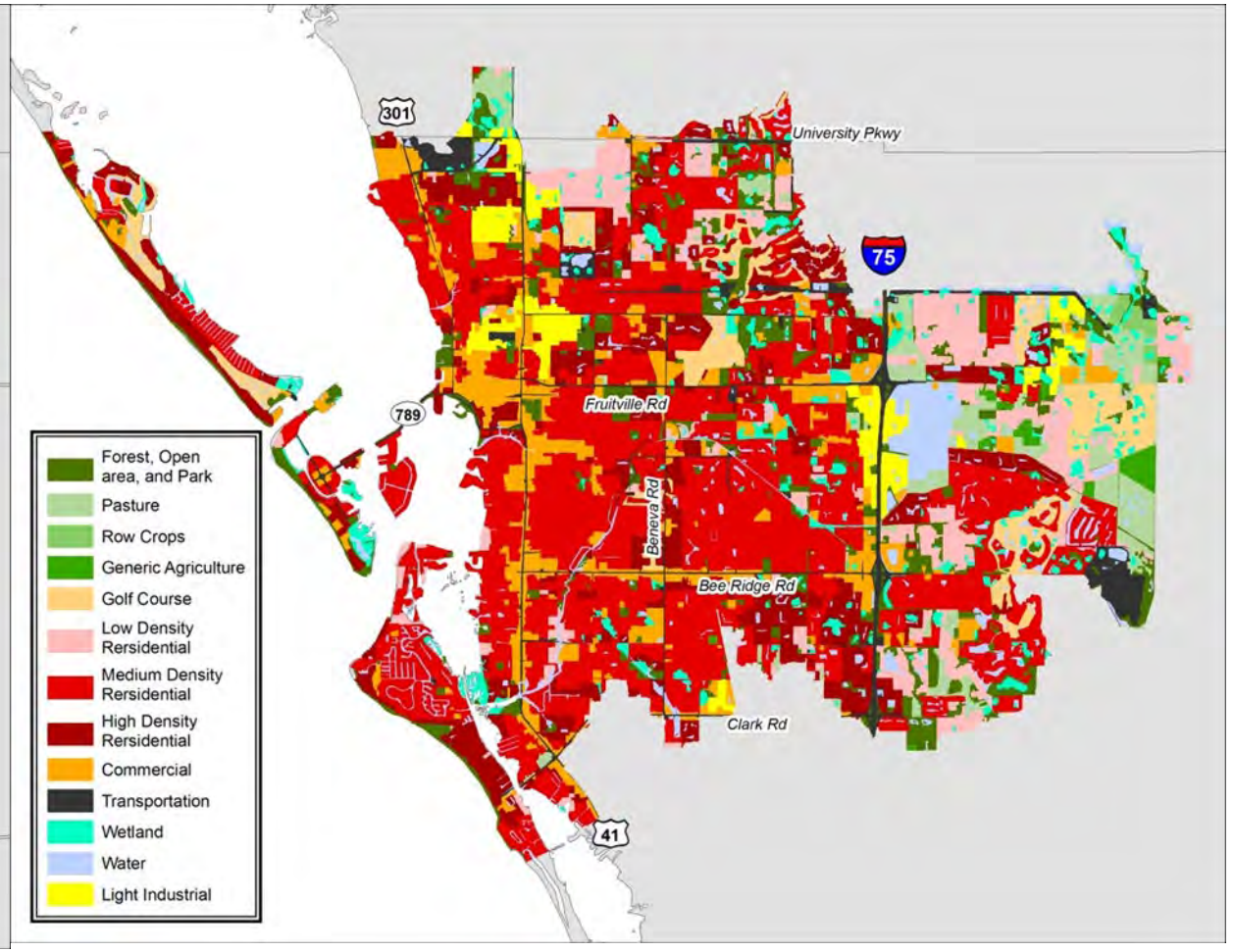
Waterbody	WBID	Nutrients			
		TN	TP	Chlorophyll a	DO
Clark Lake	1971	Impaired	Impaired	Impaired	Not Impaired
Clark Lake Drainage	1971A	Not Impaired	Not Impaired	Not Impaired	Not Impaired
Direct Runoff to Bay	1951	Insufficient Data			
Direct Runoff to Bay	1961	Insufficient Data			
Drain to Hudson Bayou	1953A	Not Impaired	Not Impaired	Not Impaired	Not Impaired
Hudson Bayou Tidal	1953	NA	NA	Impaired	Not Impaired
Island Park Boat Basin	1951A	Insufficient Data			
Philippe Creek Tributary	1941	Not Impaired	Not Impaired	Not Impaired	Not Impaired
Philippe Creek Tributary	1966	Study List	Not Impaired	Not Impaired	Not Impaired
Phillippi Creek	1937	Not Impaired	Not Impaired	Not Impaired	Not Impaired
Phillippi Creek Tidal	1947	NA		Not Impaired	Not Impaired
Sarasota Coastal Drainage	1931	NA		Insufficient Data	
Walker Creek	1936A	Not Impaired	Not Impaired	Not Impaired	Not Impaired
Whitaker Bayou Tidal	1936	NA		Impaired	Not Impaired


NEXRAD Rainfall
Landuse Soils
=
Runoff & Baseflow Volumes
Hydrologic Engine
Baseflow Loads
+
Septic Systems
+
Irrigation
Table of Coefficients EMCs & Baseflow Concentrations
Runoff Loads
+
Point Sources (Accidental Releases)
+
Atmospheric Deposition (Open Waters)
Total Load

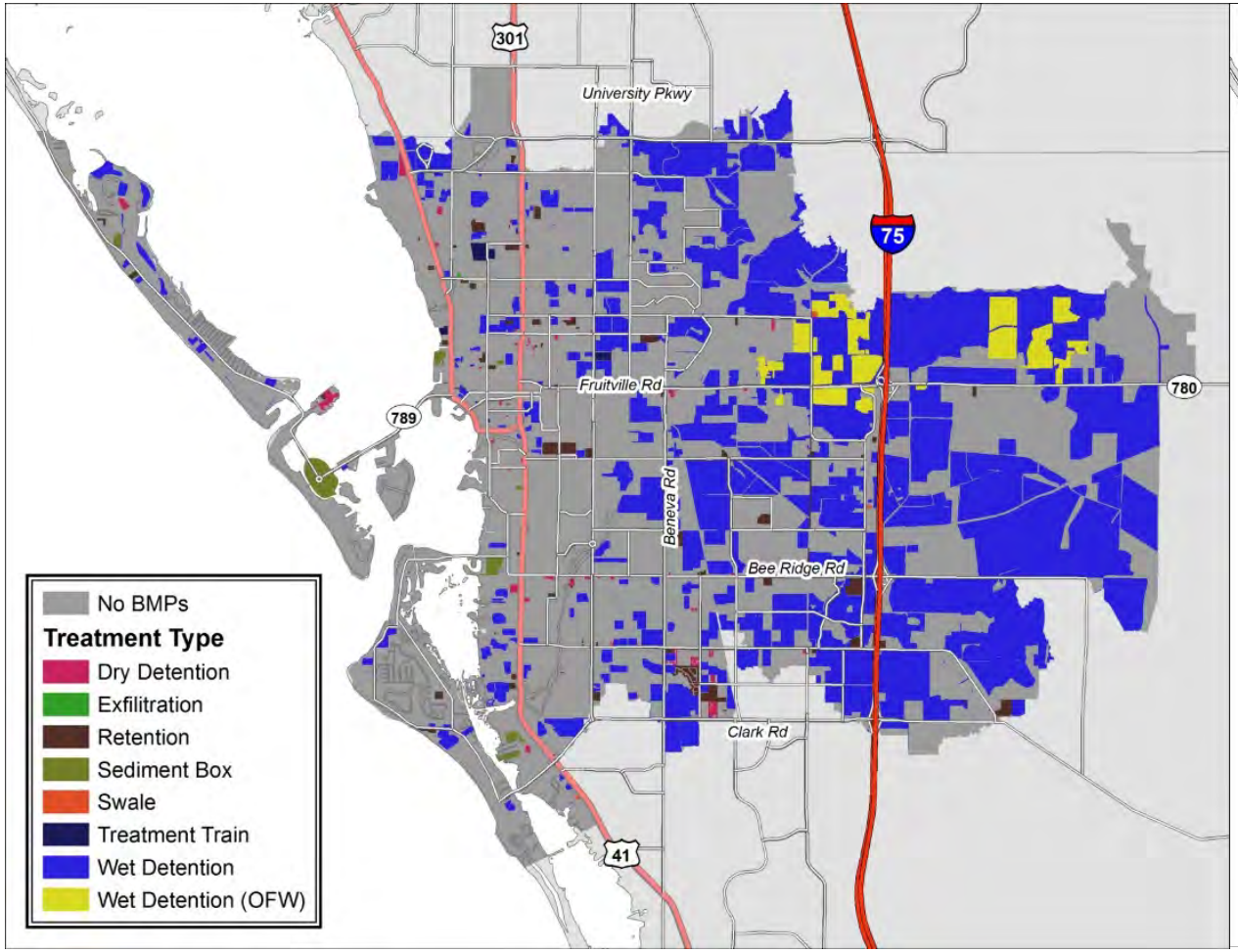
Basins



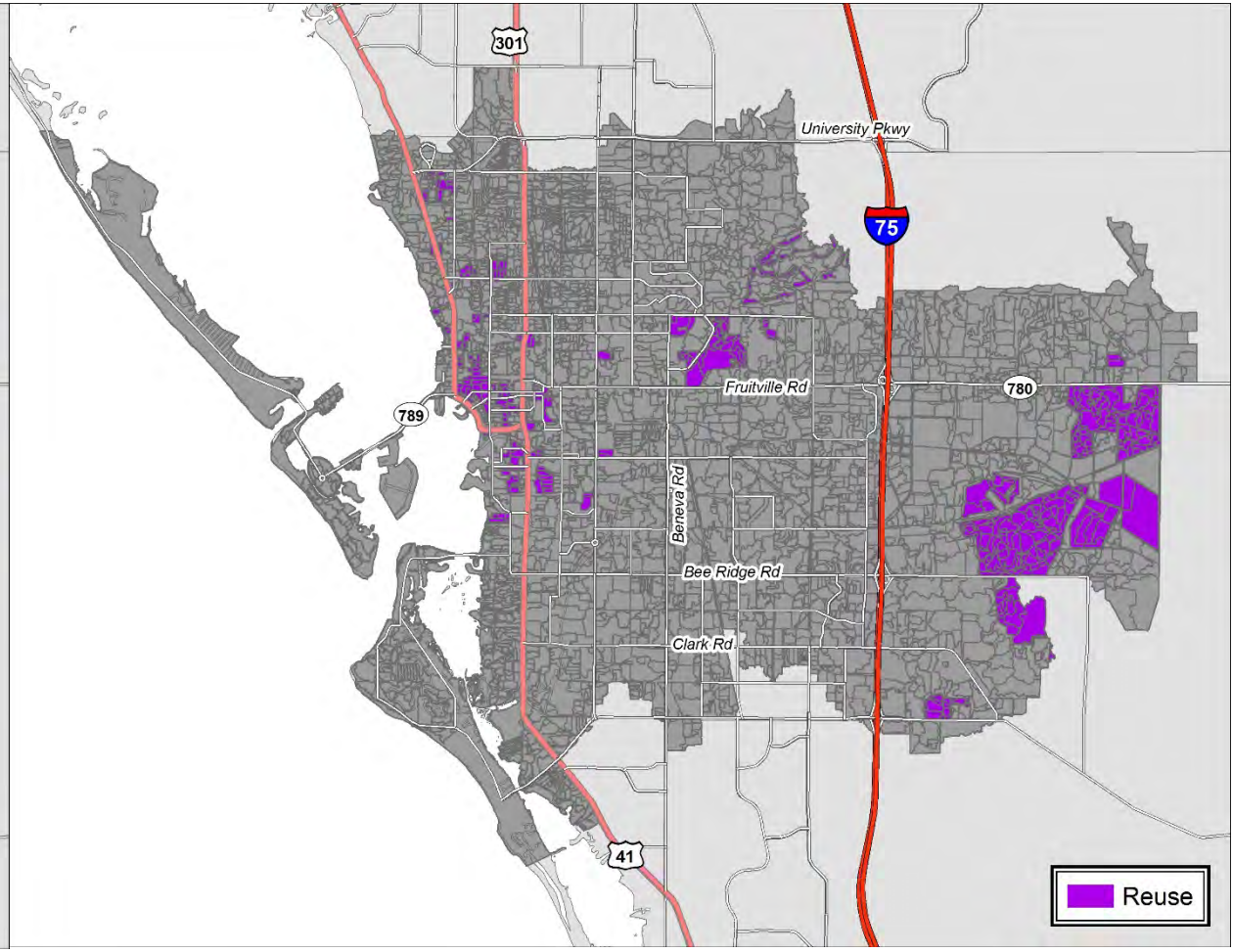
Landuse



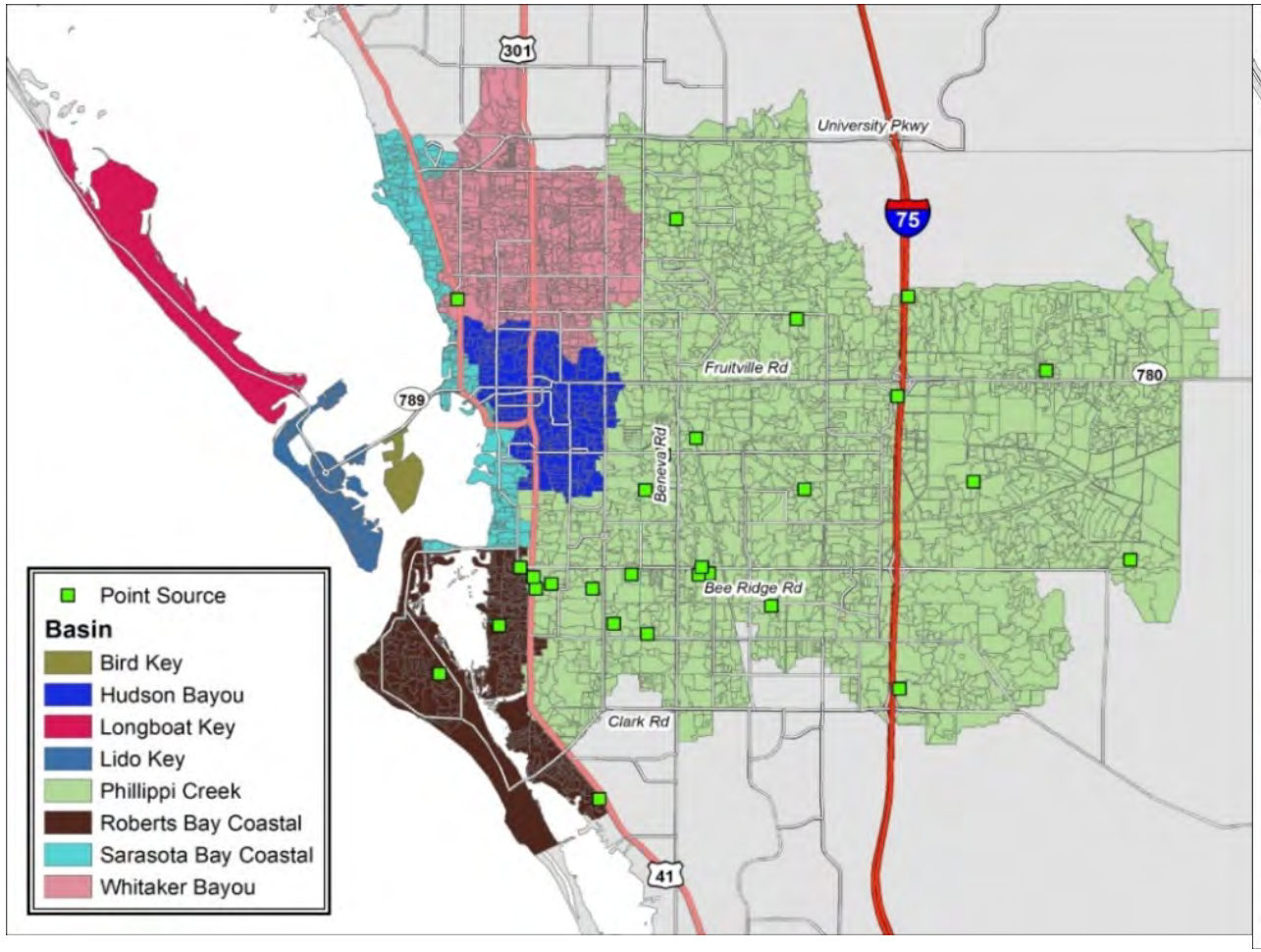
Best Management Practices



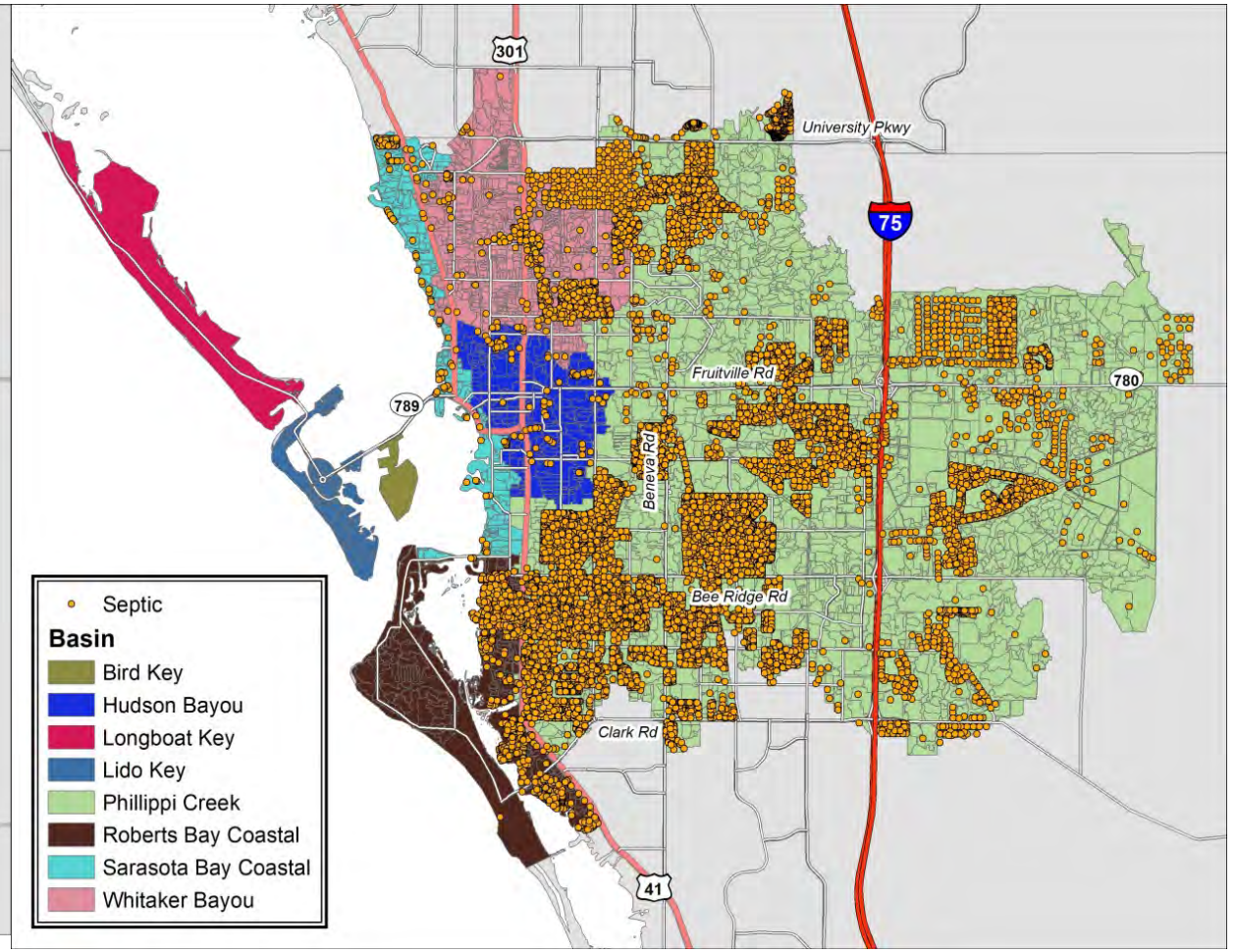
Reclaimed Water Irrigation



Point Sources

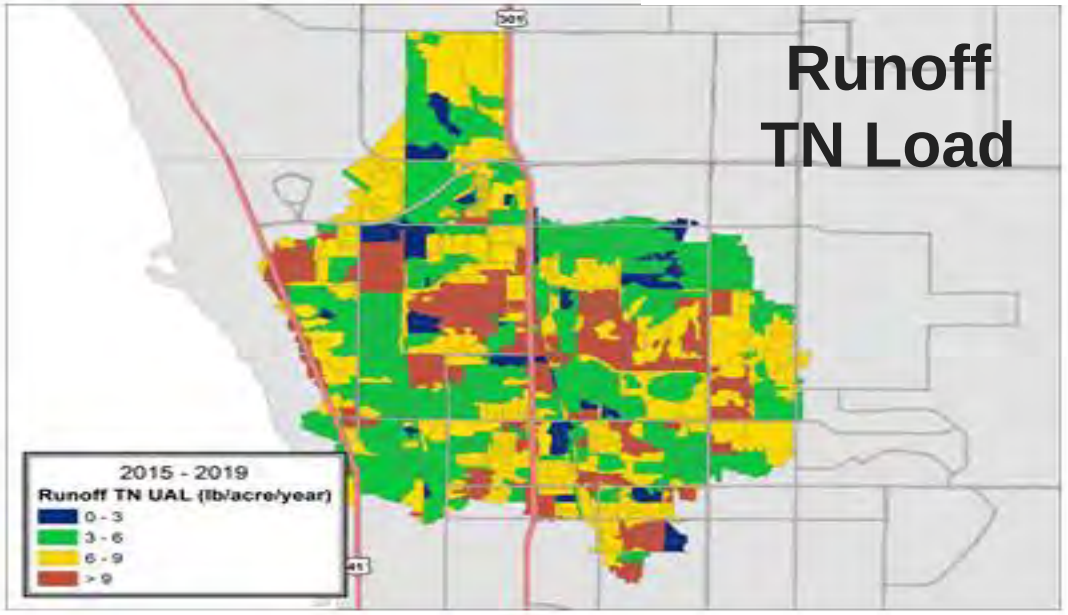


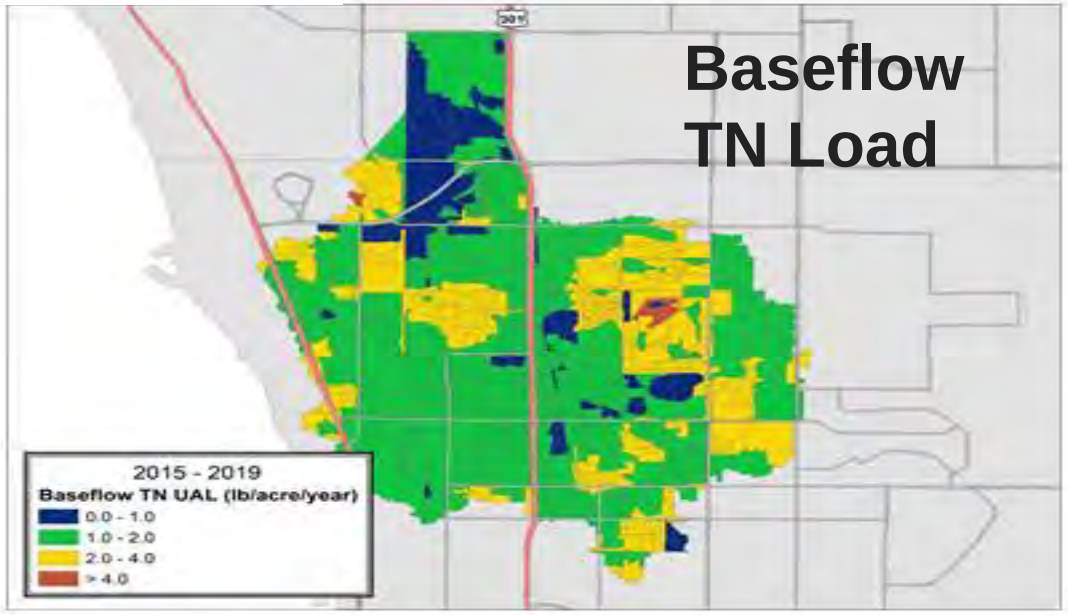
Septic Systems

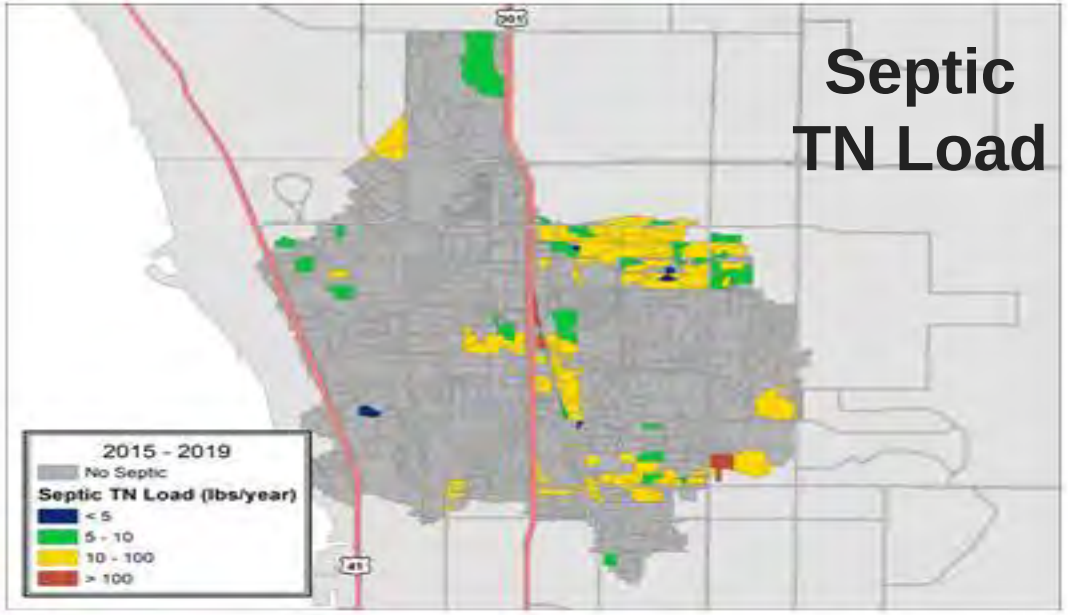


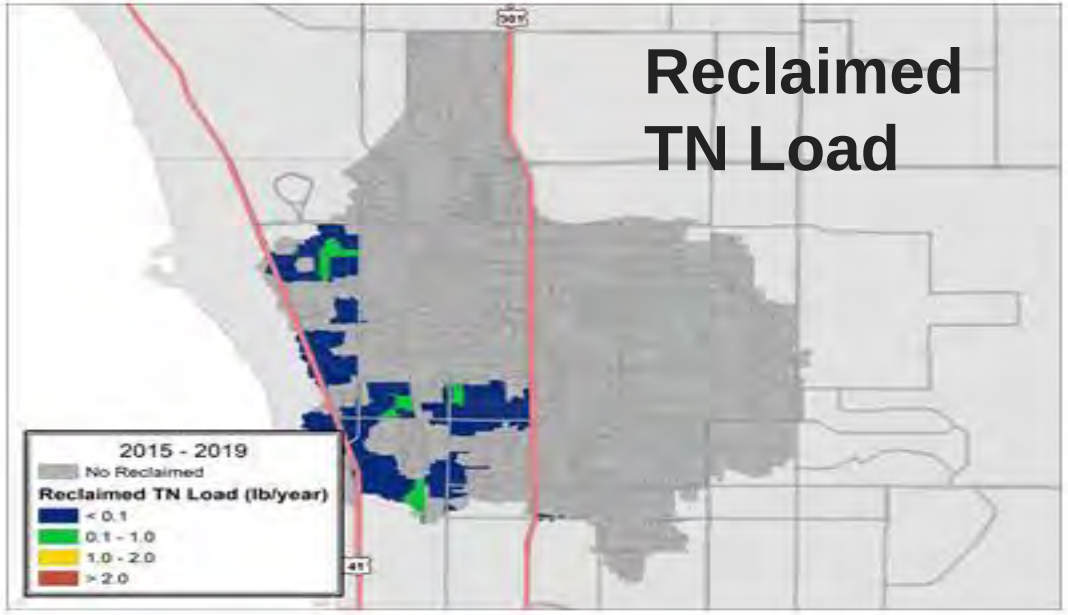
Percent of total nitrogen load per basin by source over 2015-2019.						
Basin	Source					
	Accidental Releases	Baseflow	Point Sources	Reclaimed Irrigation	Runoff	Septic Systems
Bird Key		22.20			77.80	
Hudson Bayou	0.27	18.19		0.04	81.05	0.47
Lido Key	0.01	17.06			82.93	
Longboat Key		20.10			79.90	
Phillippi Creek	3.71	21.79	0.38	2.08	63.03	9.00
Roberts Bay Coastal	0.04	14.87	28.71		54.94	1.44
Sarasota Bay Coastal	0.02	21.28		0.02	76.89	1.79
Whitaker Bayou	0.01	18.26	8.94	0.01	68.06	4.72

Whitaker Bayou



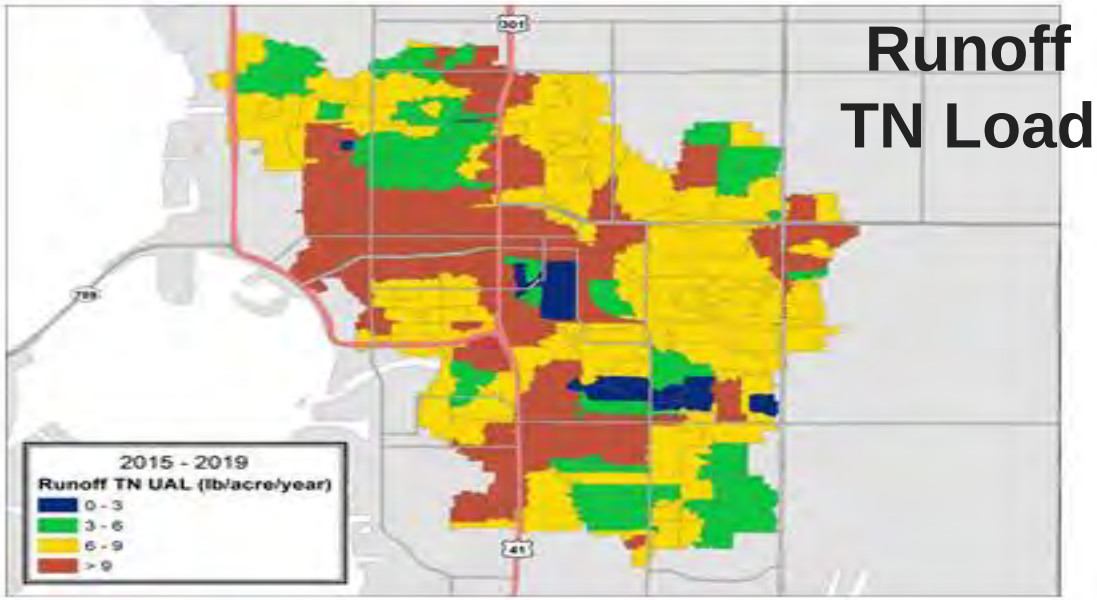




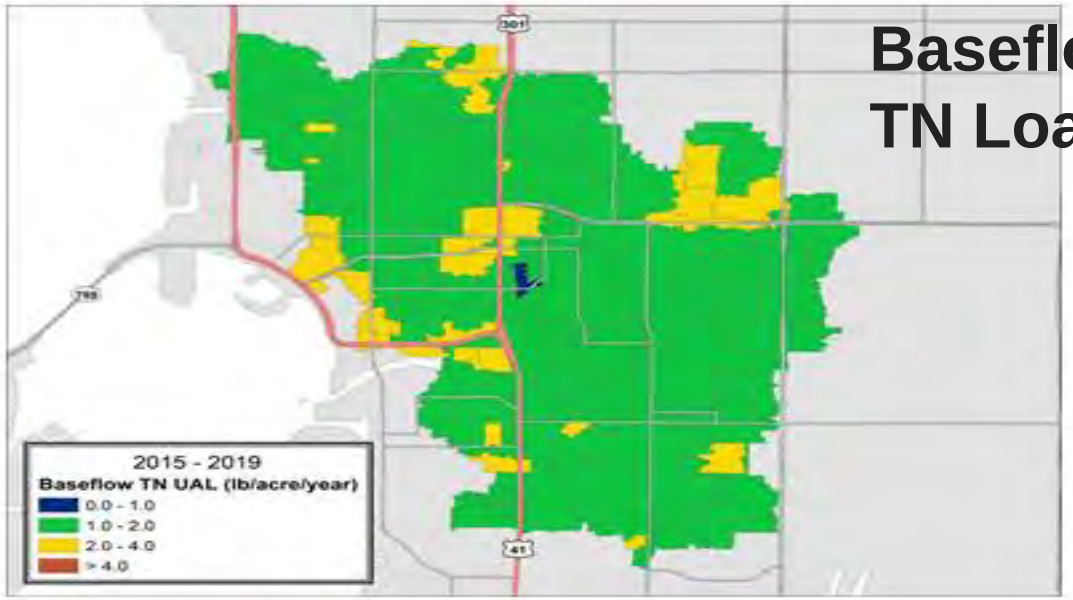


Hudson Bayou

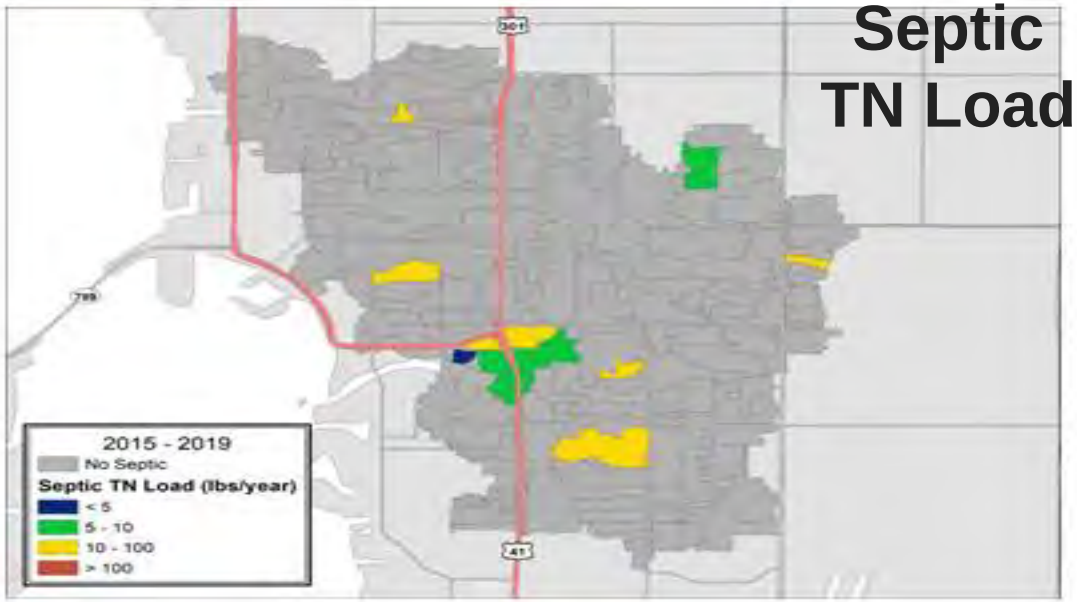
Runoff TN Load



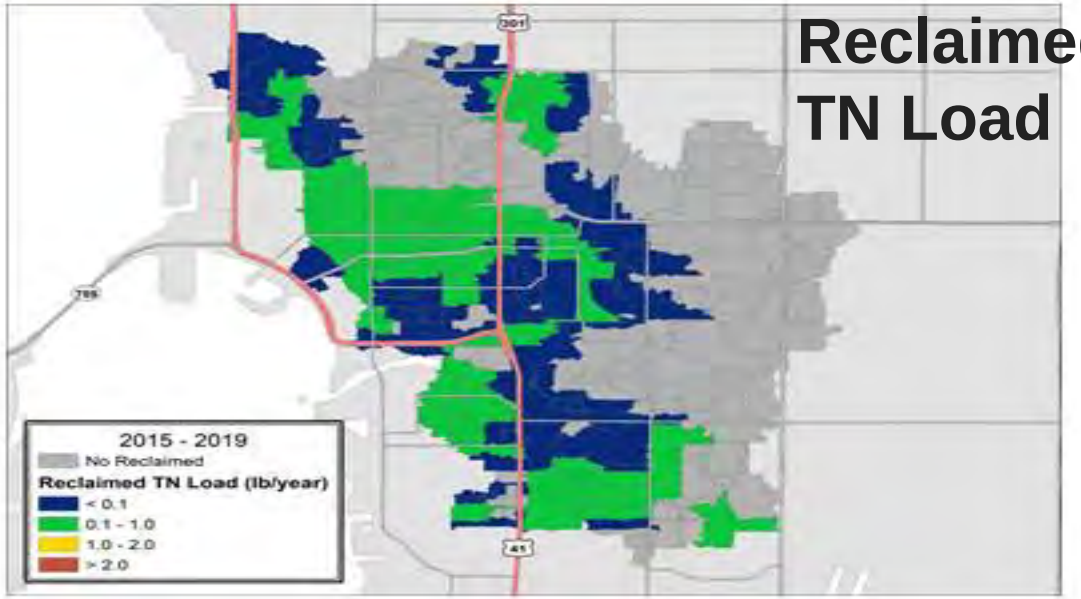
Baseflow TN Load



Septic TN Load

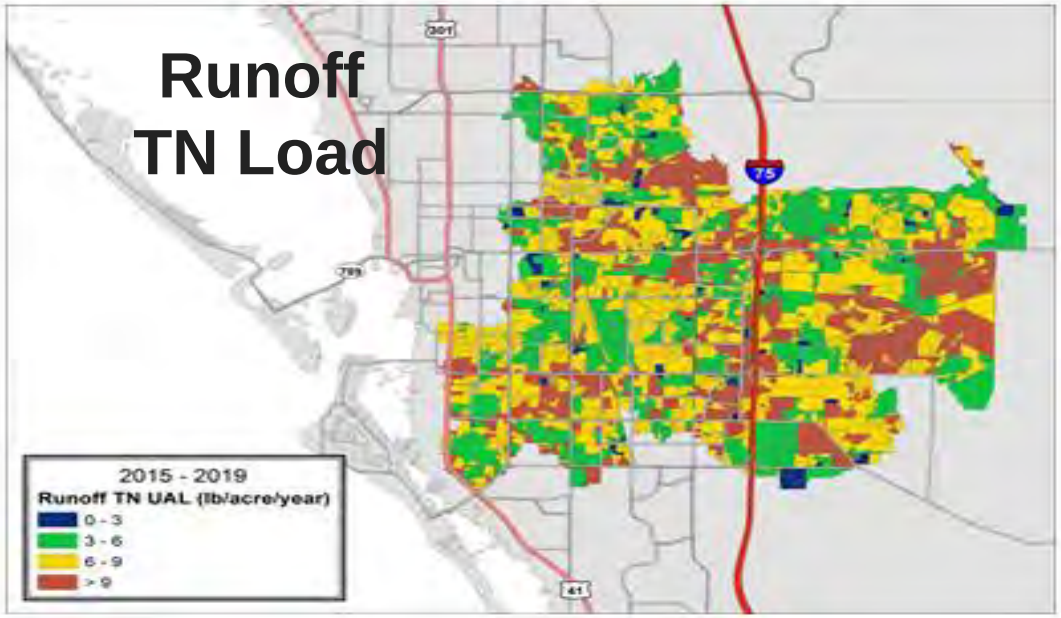


Reclaimed TN Load

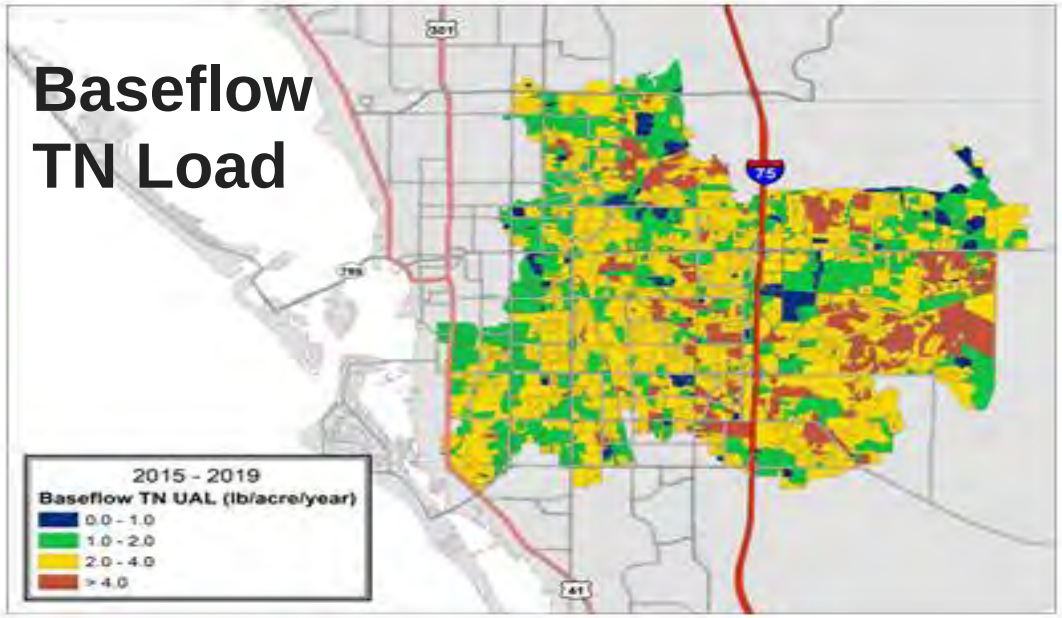


Phillippi Creek

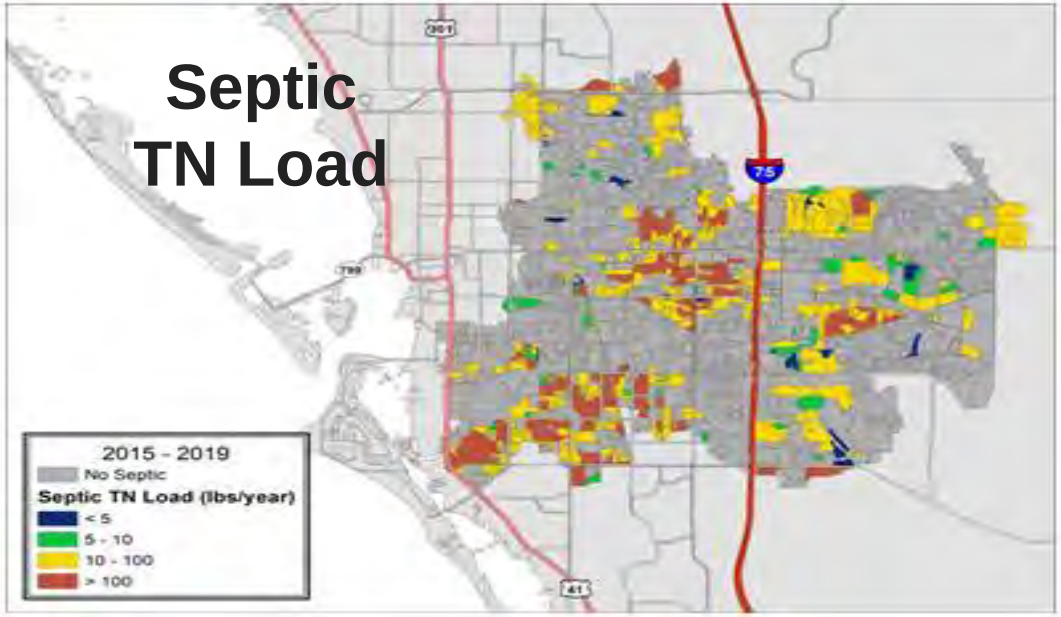
Runoff TN Load



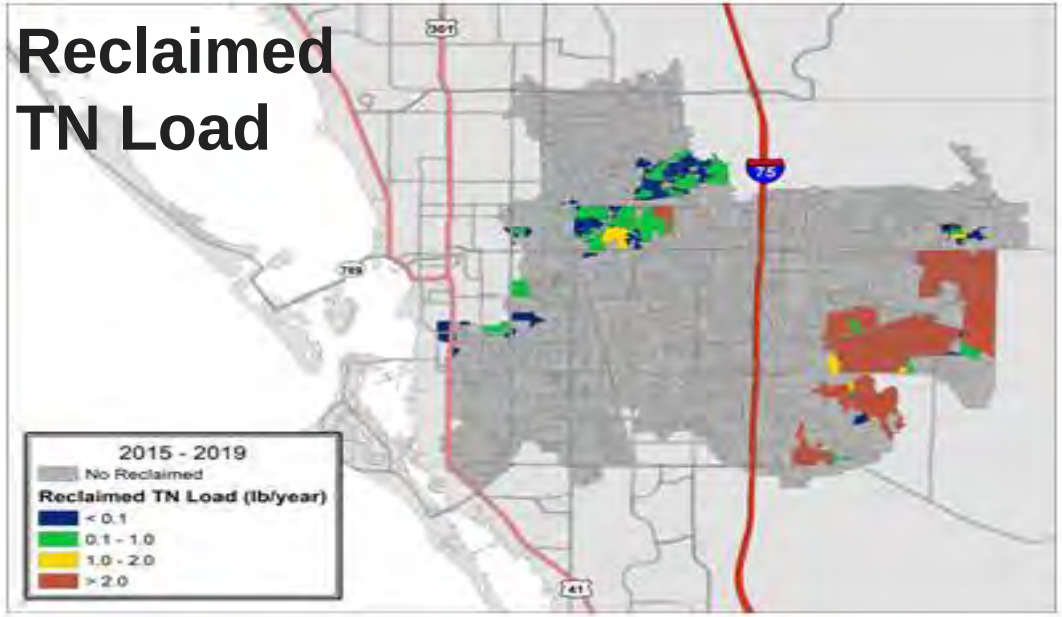
Baseflow TN Load



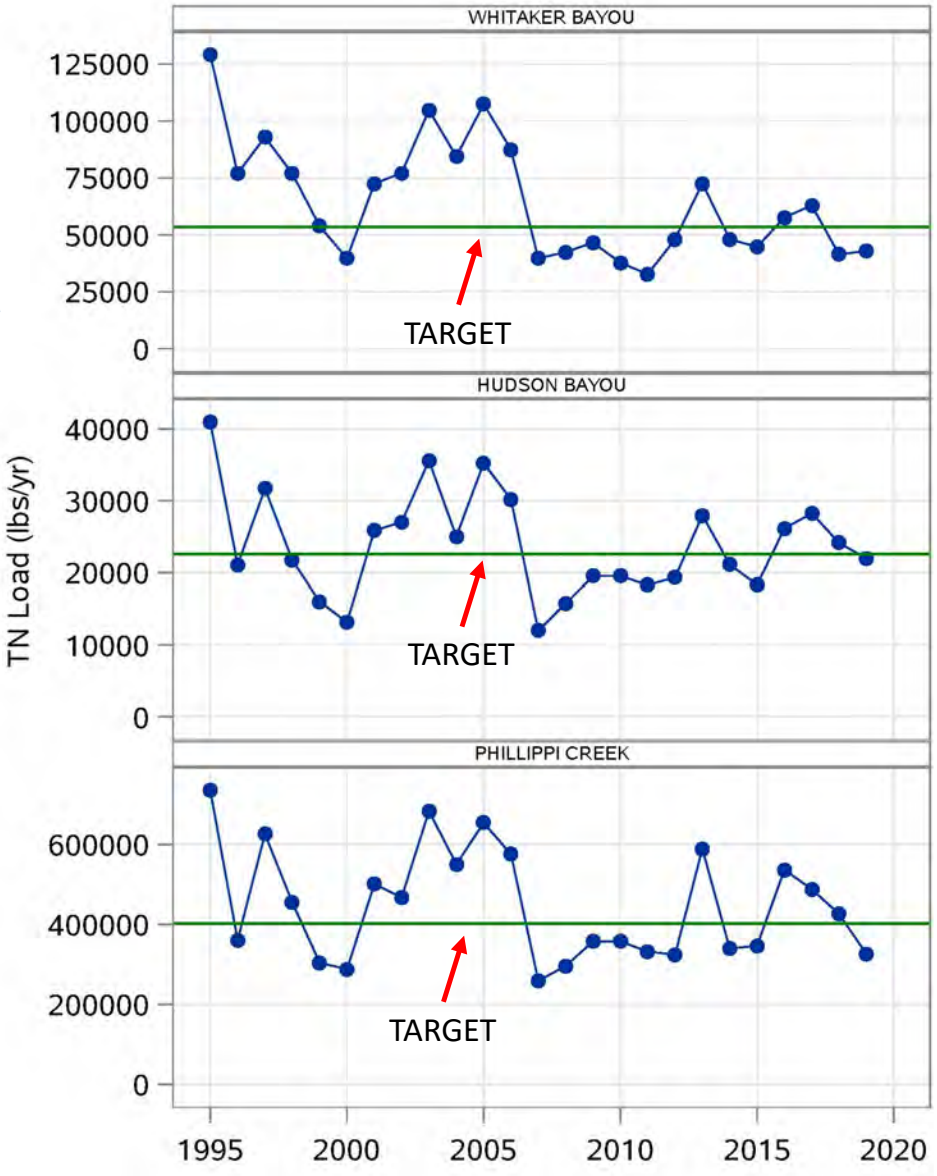
Septic TN Load



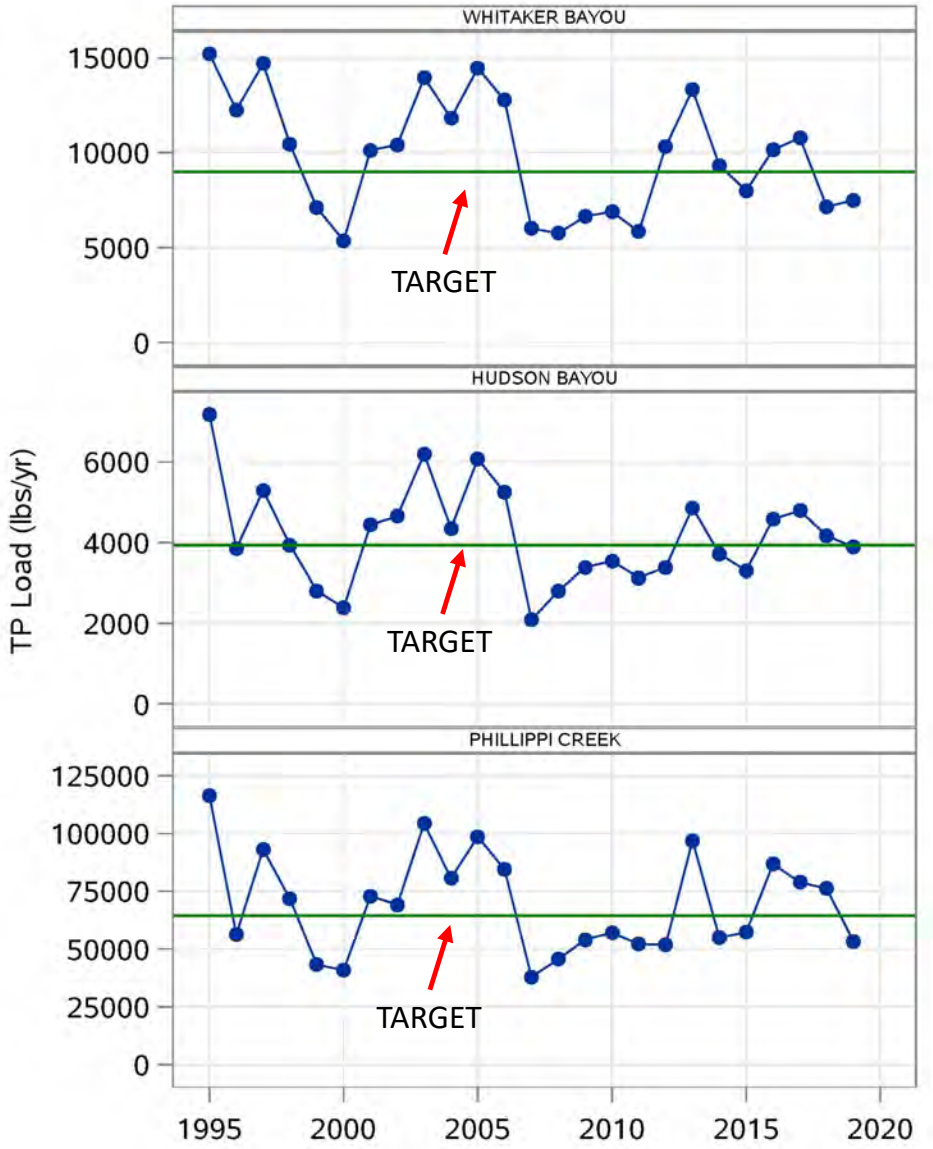
Reclaimed TN Load



TN Load



TP Load

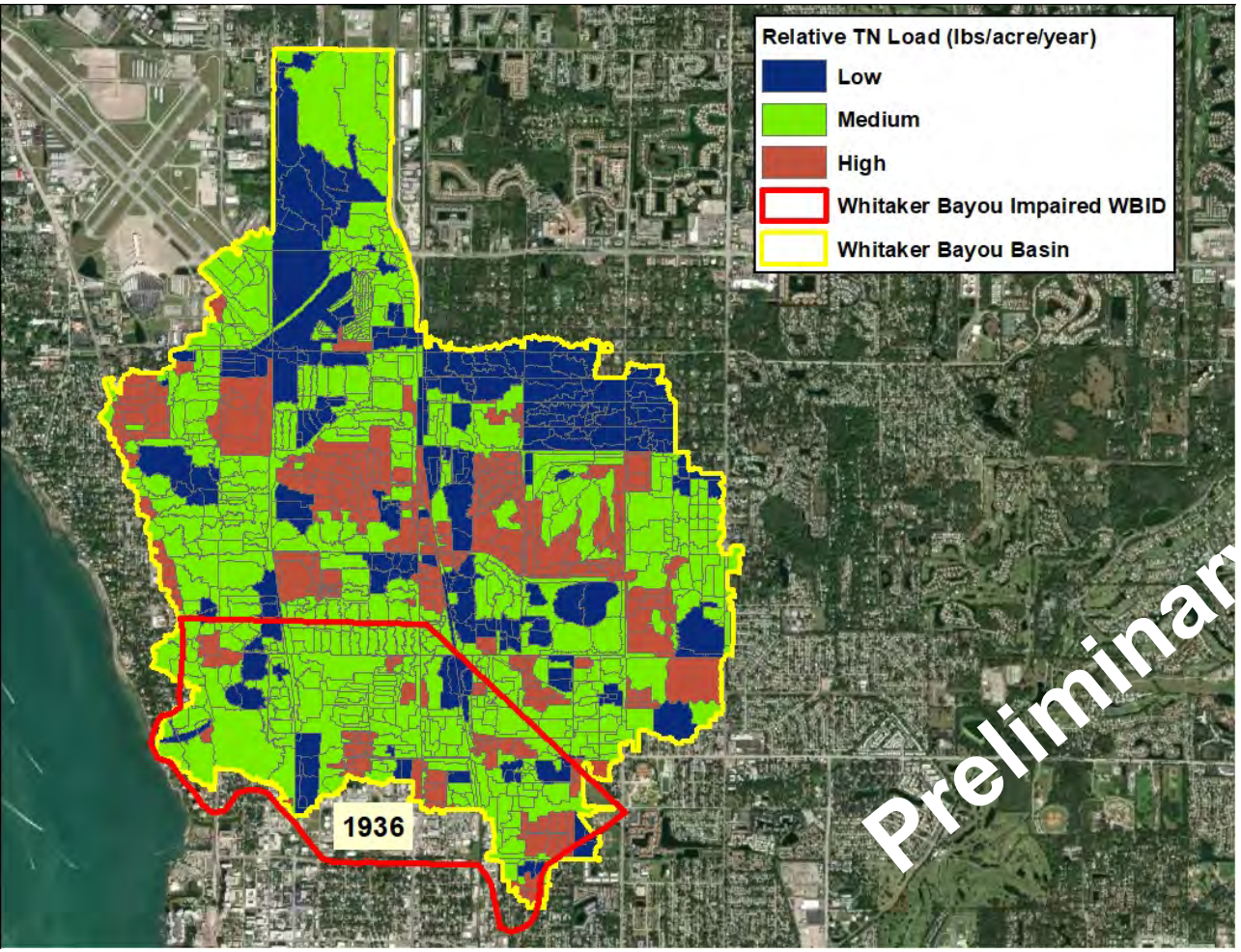


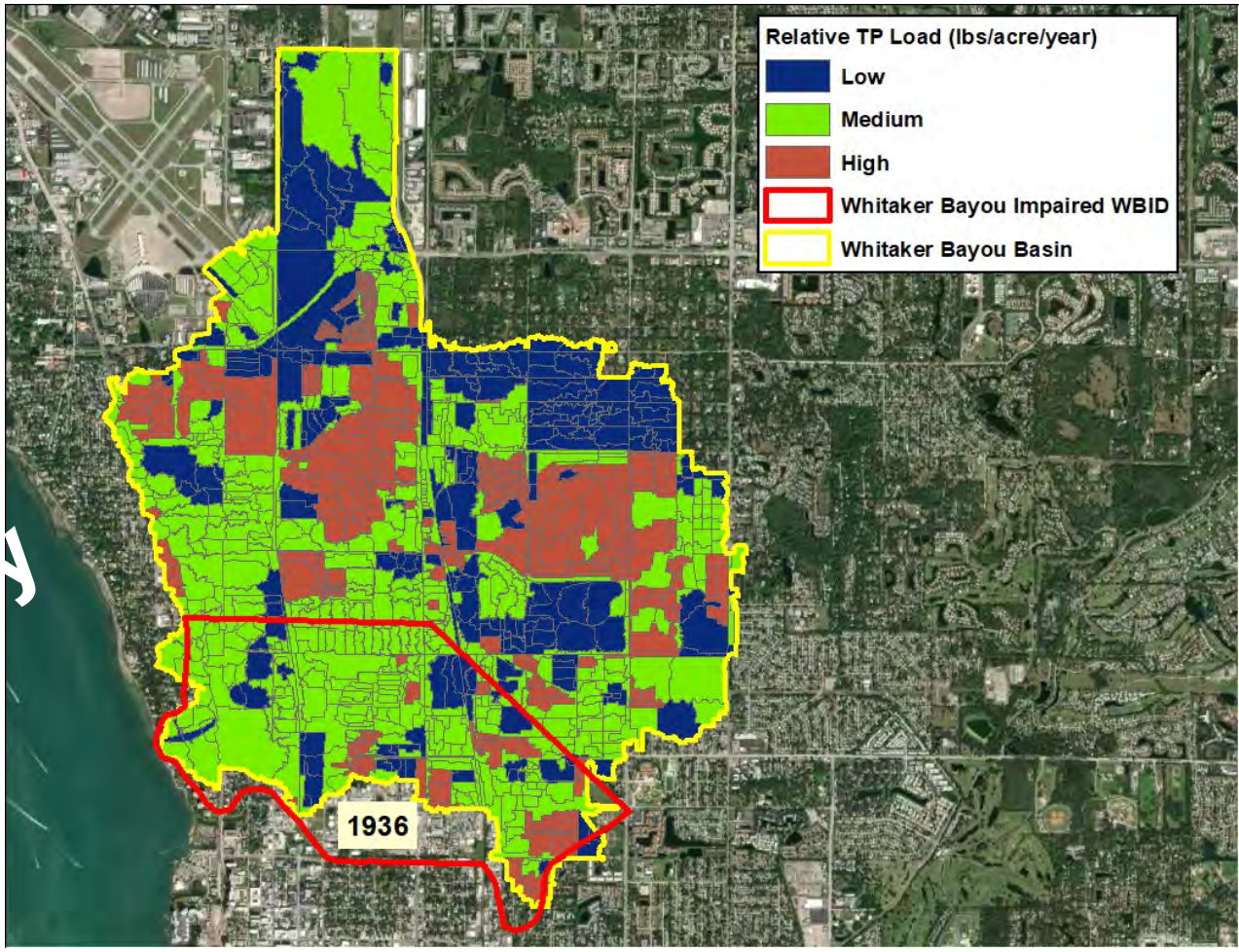
“Hot Spots”

Identify and prioritize areas that are major contributors of nutrient loads

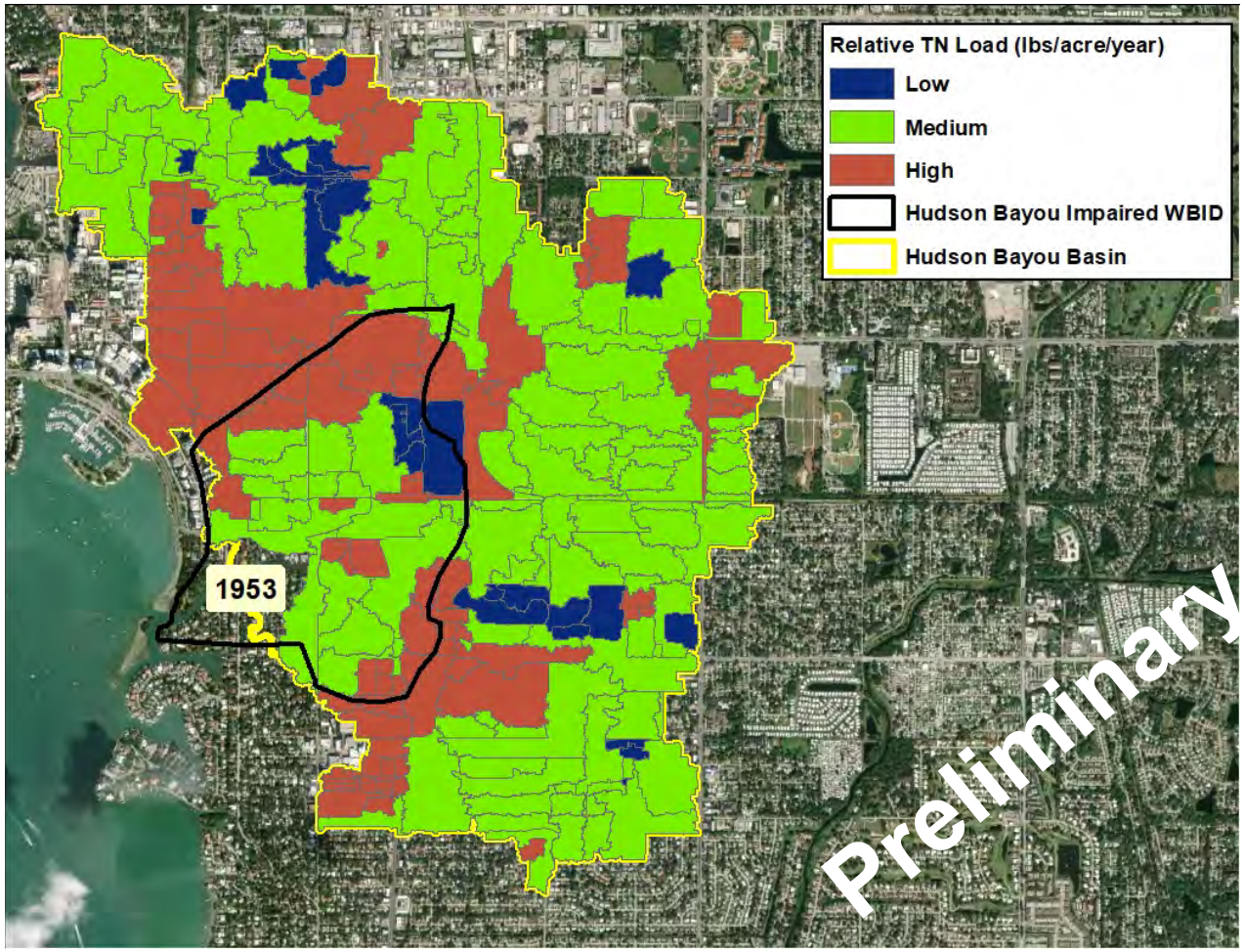
- **Based on Impaired Waters**
- **Based on overall loading**

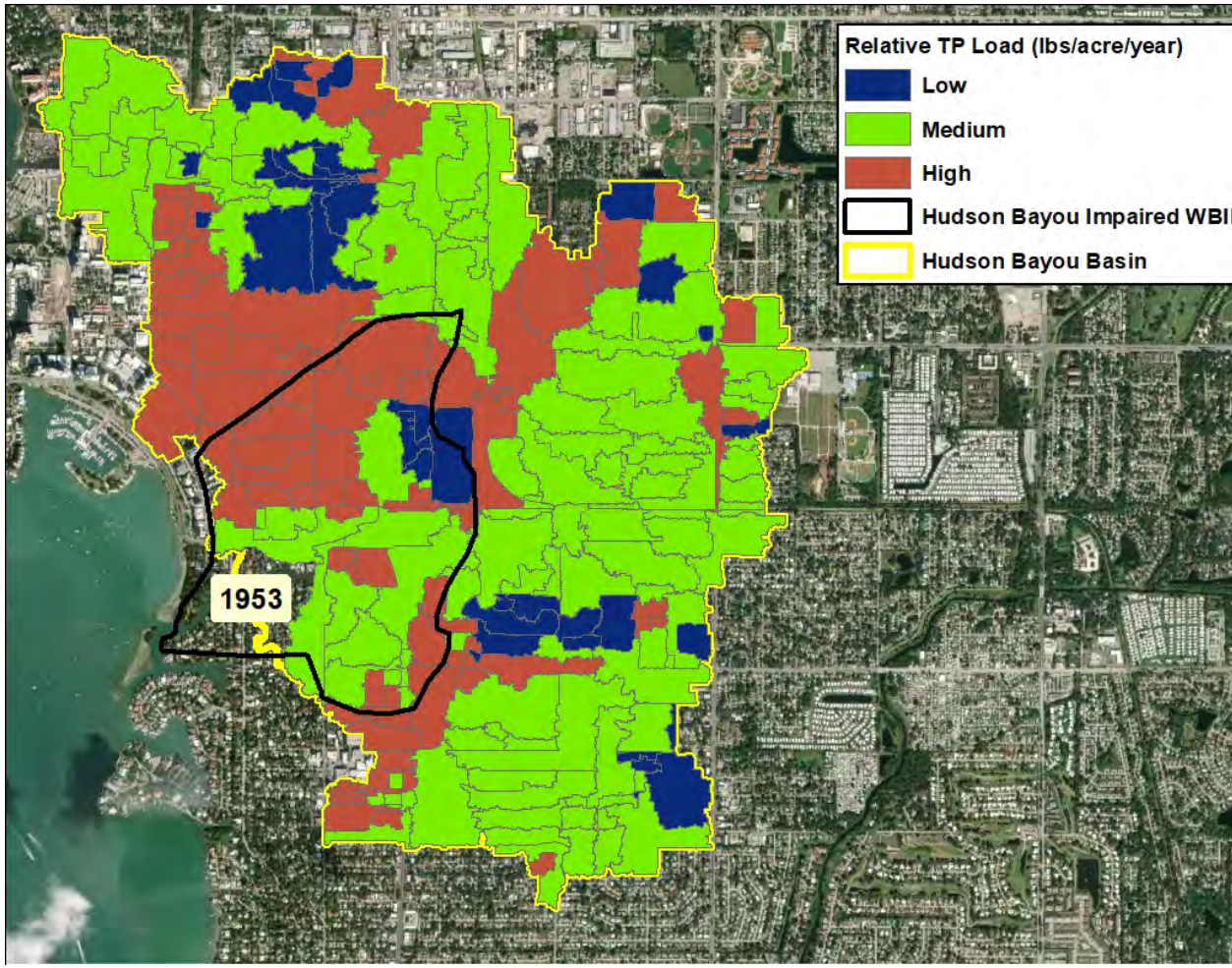
Whitaker Bayou





Hudson Bayou





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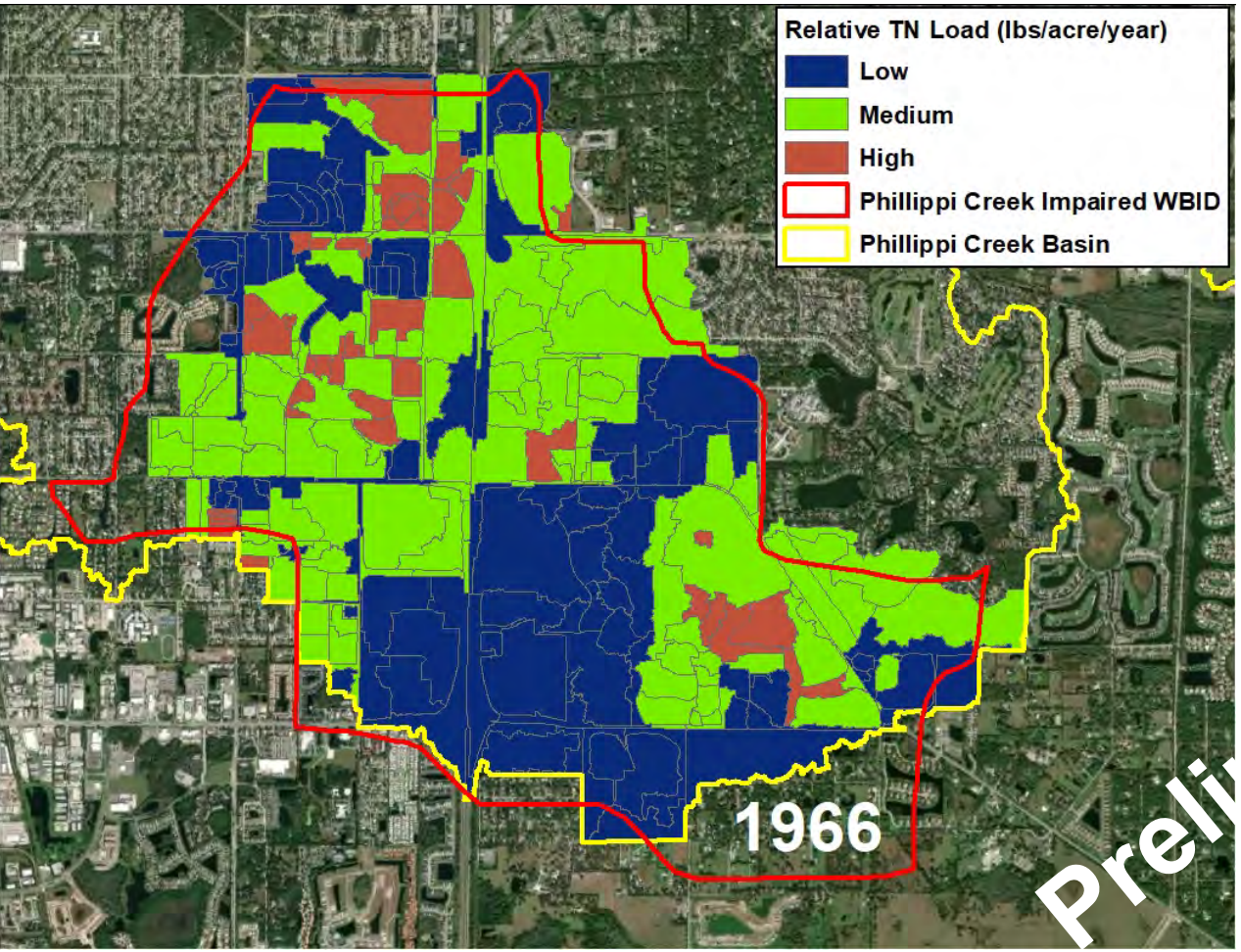
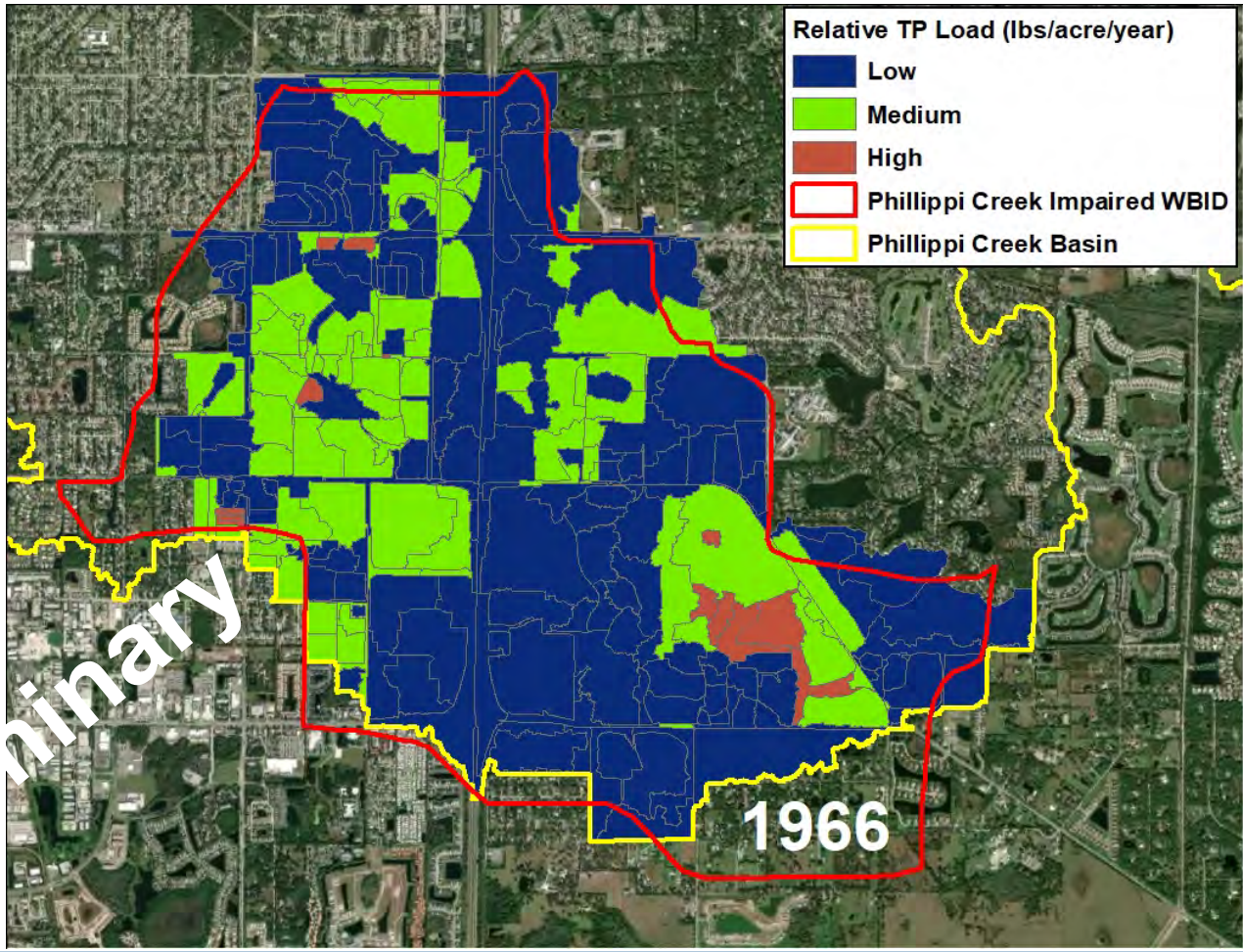
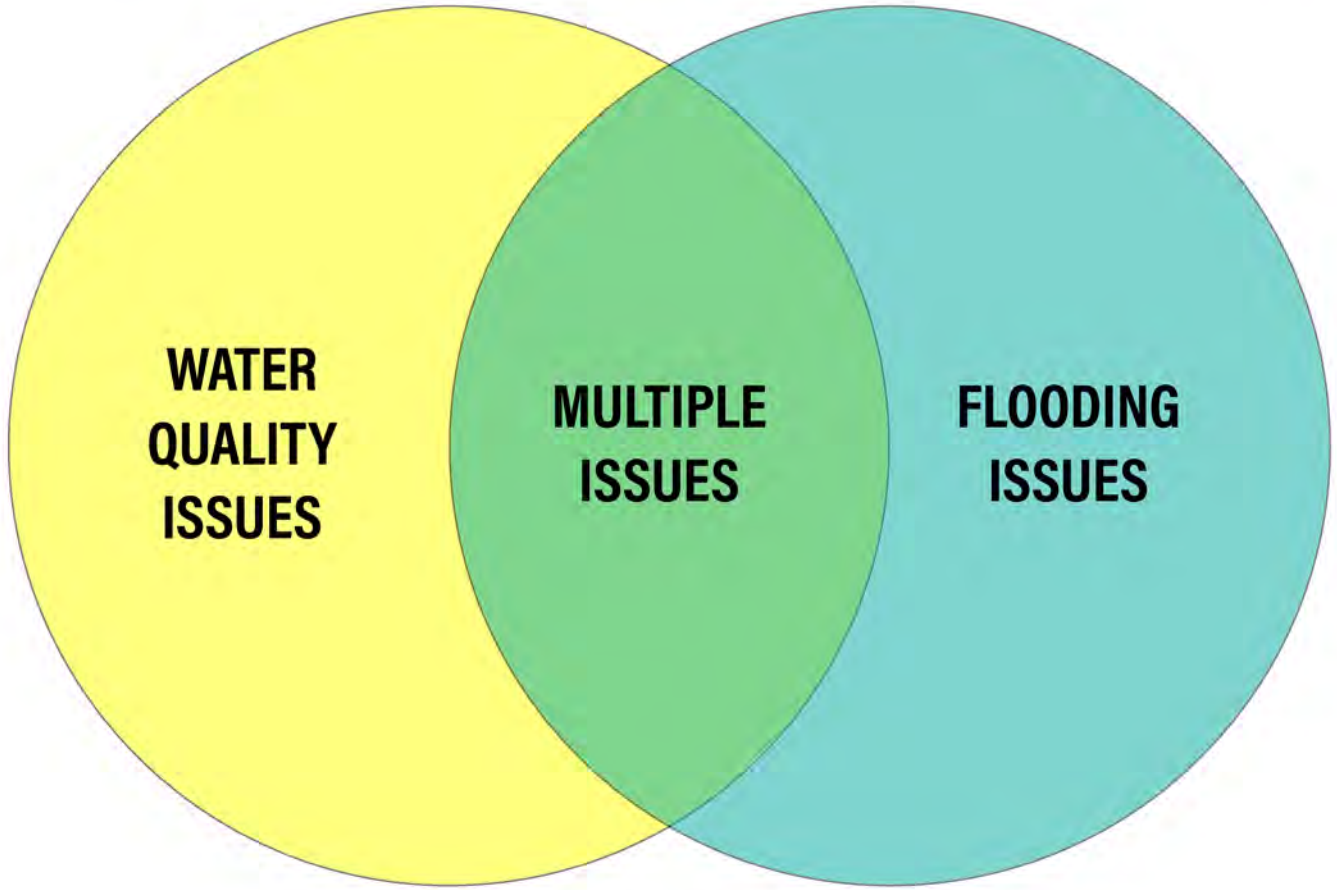
Phillippi Creek





Holistic Approach Addressing Flooding and Water Quality

HOTSPOT PRIORITIZATION



Flood and water quality (nutrient) hotspots will be integrated to prioritize areas with multiple issues for mitigation.

Next Steps

- Select projects
- Model with BMPTRAINS
- Convene and facilitate stakeholders to provide input and added-value for projects
- Develop funding strategy
- Present to the Board of County Commissioners

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Questions?