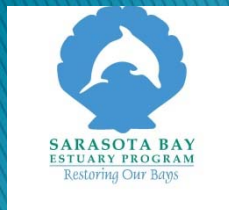


Estimating Pollutant Loads for the Sarasota Bay Estuary Program Watershed is SIMPLE?



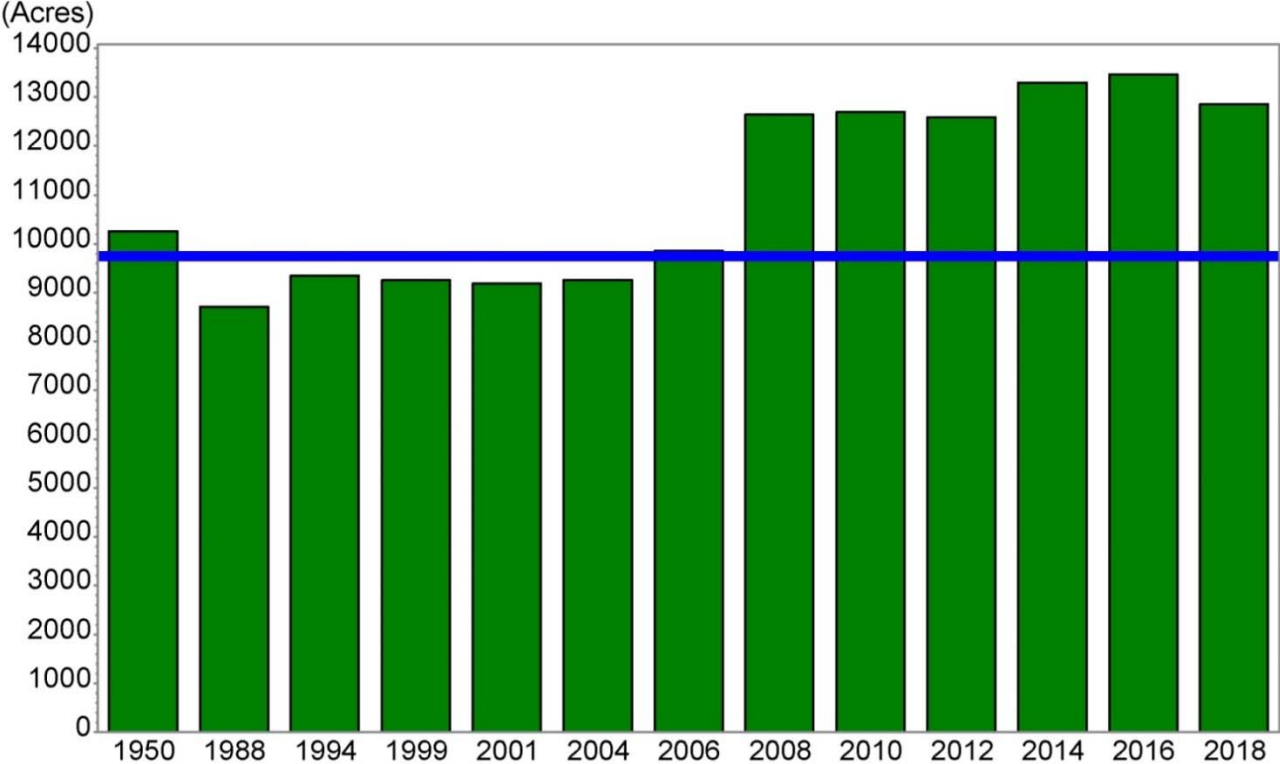
Jon Perry and Mike Wessel, Janicki Environmental, Inc.
Dr. Jay Leverone, Sarasota Bay Estuary Program

Historical Improvements

- Grizzle Figg Act – required wastewater discharges to SW Florida estuaries be treated to Advanced Wastewater Treatment (AWT) standards
- Improved stormwater treatment
- Septic to Sewer conversions in priority watersheds
- Eliminating small package plants
- Increasing production for reclaimed water supply



Seagrass – Our Keystone Indicator



Recent Concerns

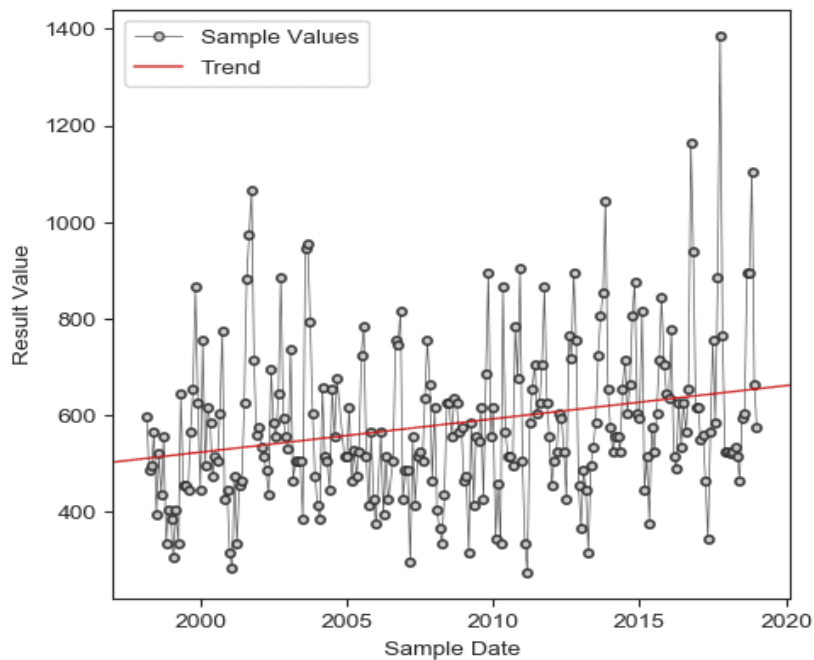
- At the time, timeseries trend tests reported increasing nitrogen concentrations throughout the watersheds and estuaries
- Recent exceedences of regulatory water quality standards for chlorophyll in most segments
- Coincident episode of harmful algal blooms have heightened concerns regarding nutrient pollution and its effects on estuarine health



Timeseries Trends in TN

1998–2018

TN_UGL
SARASOTAES_WQ : 14-3



<http://www.sarasota.wateratlas.usf.edu>

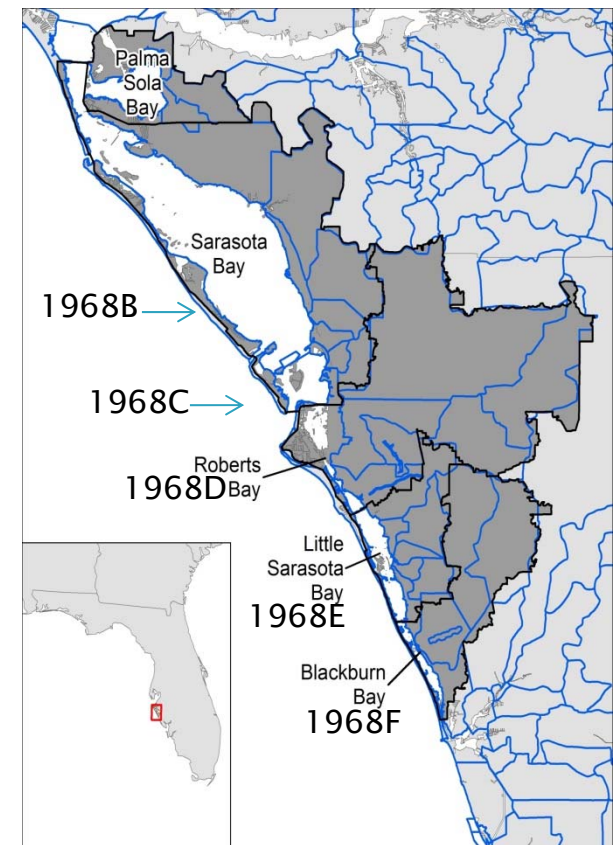
Letter from FDEP To SBEP, March 24, 2020

Table 1: Verified Impaired Parameters

WBID	Water Segment Name	Parameters Assessed	Concentration of Criterion or Threshold Not Met	Verified Period Assessment Data ^a	Comments
1883	Palma Sola Bay	Fecal Coliform	≤ 43 MPN / 100 mL	128 / 704	Impaired based on the number of exceedances. Exceeds Class II criteria for bacteria.
1968B	Sarasota Bay	Bacteria (in Shellfish)	Exceeds Shellfish Evaluation & Assessment Section (SEAS) thresholds		Listed based on shellfish harvesting classification of prohibited by Shellfish Environmental Assessment Section (SEAS) of the Department of Agriculture.
1968F	Blackburn Bay	Nutrients (Total Nitrogen)	ENRC5: AAM ≤ 0.43 mg/L	ENRC5: AGM 2008 (0.33 mg/L) 2009 (0.31 mg/L) 2010 (0.38 mg/L) 2011 (0.37 mg/L) 2012 (0.37 mg/L) 2013 (0.46 mg/L) 2014 (0.45 mg/L) 2015 (0.35 mg/L)	This waterbody is impaired for this parameter because the annual arithmetic means exceeded the criterion more than once in the most recent consecutive three-year period. This parameter is being added to the 303(d) List.

“In addition, there are four WBIDs (1968C, 1968D, 1968E, 1968F) that are impaired for nutrients and chlorophyll a and would be placed on the Verified List for the upcoming basin assessment.....

Draft assessments will be available September 2021.”



Tasks

Task 1: Convene Water Quality Management Consortium

Task 2: Data Acquisition and Synthesis

Task 3: Watershed Pollutant Loading Analysis

Task 4: Nutrient Response Model Evaluation

Task 5: Identification of Next Steps



Task 2: Data Acquisition and Synthesis

Water Quality

- FDEP IWR Run 58
- Sarasota County
- Manatee County
- USF Water Atlas

Biology

Seagrass

- SWFWMD Surveys
- Sarasota County
- FDEP Transects

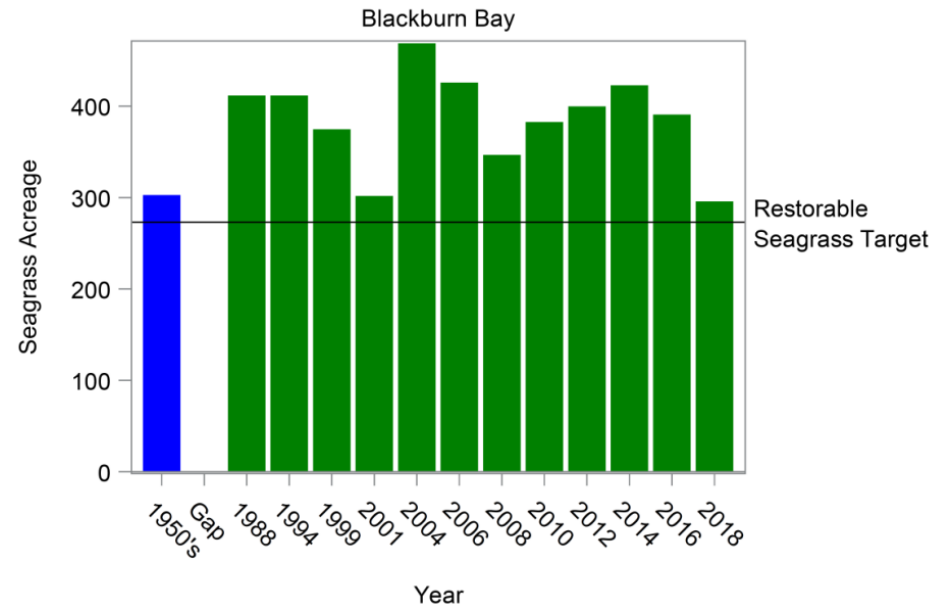
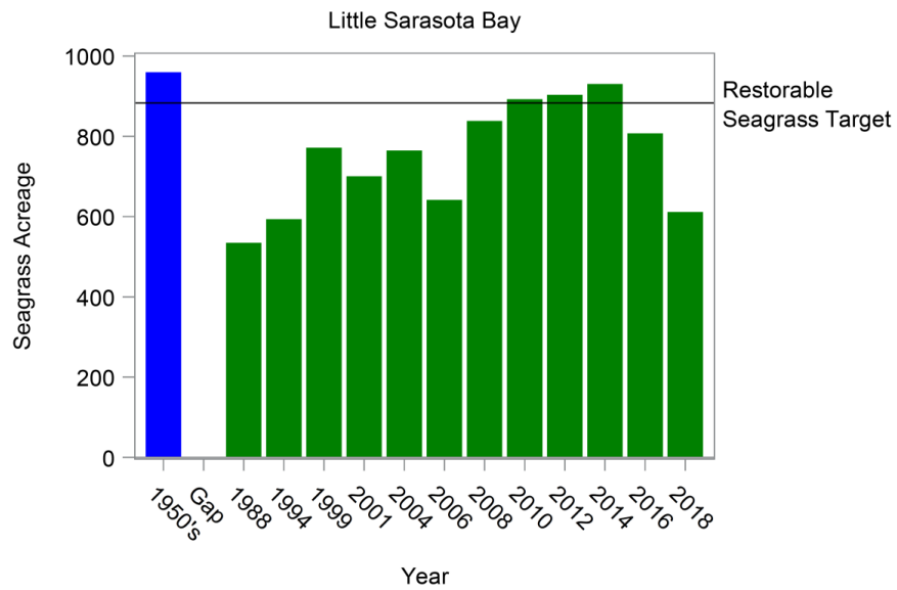
FIM Nekton

SIMPLE

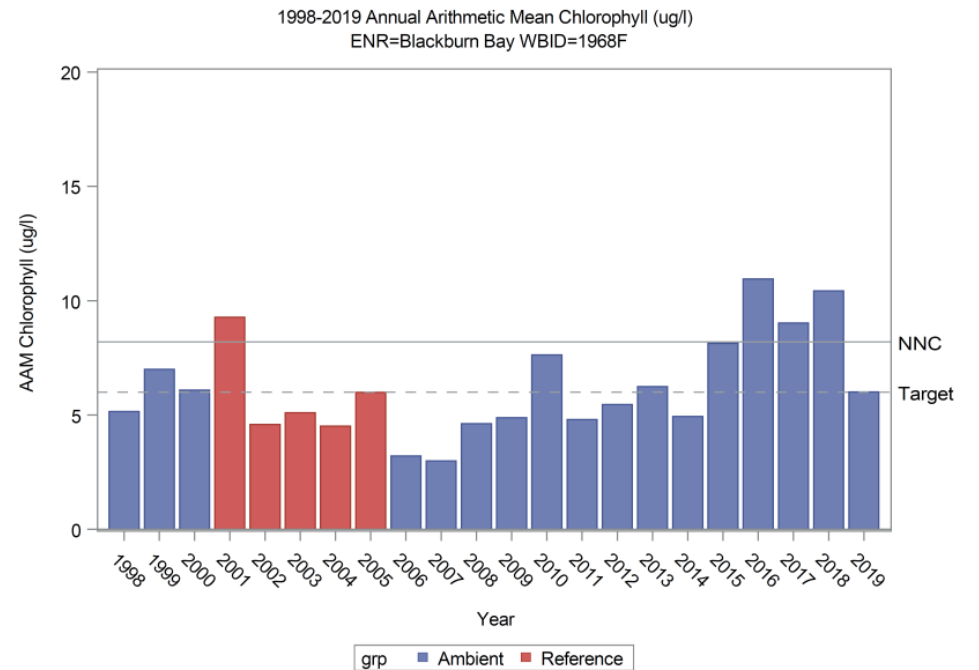
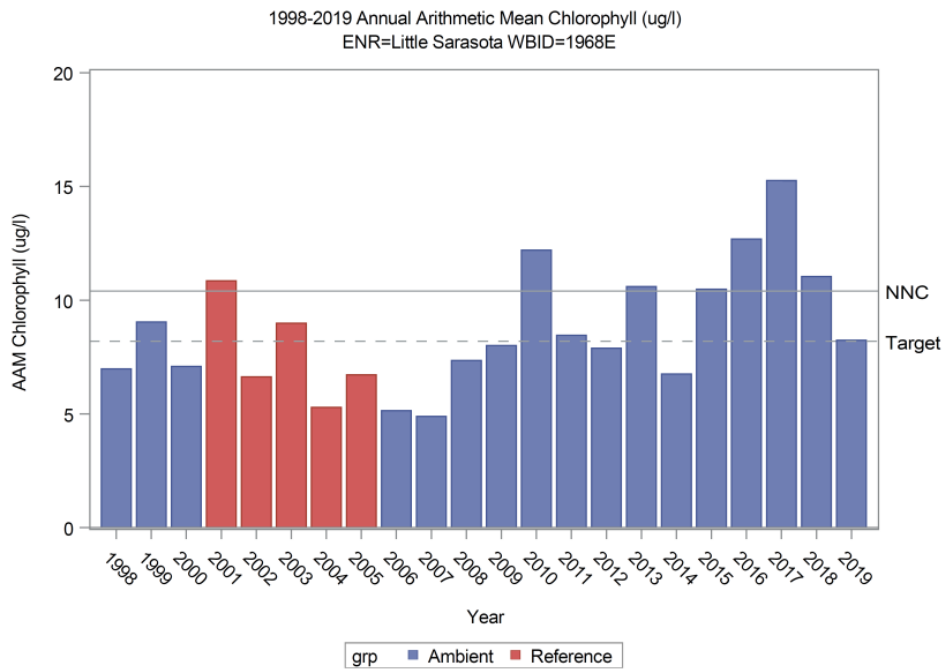
- Rainfall
- Landuse
- BMP's
- Reclaimed water



Seagrass Acreage Through 2018



Chlorophyll a ($\mu\text{g/l}$)



- General Conceptual Model
 - Increase N \rightarrow increase Chl *a* \rightarrow seagrass loss
- While Chlorophyll *a* is exceeding criteria and Nitrogen is not
- There is a need to investigate other confounding factors and reexamine relationships



Task 3: Pollutant Loading Model – SIMPLE

- ▶ Originally designed for Sarasota County
- ▶ Expanded the coverage to Manatee County for SBEP NNC development
- ▶ Used in the development of 4 WMPs for Sarasota County
- ▶ Used throughout the State, including the development of the Mosquito Lagoon RAP



SIMPLE Capabilities

Model Loading Sources

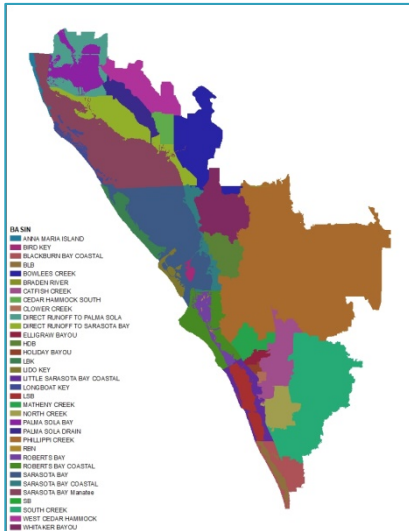
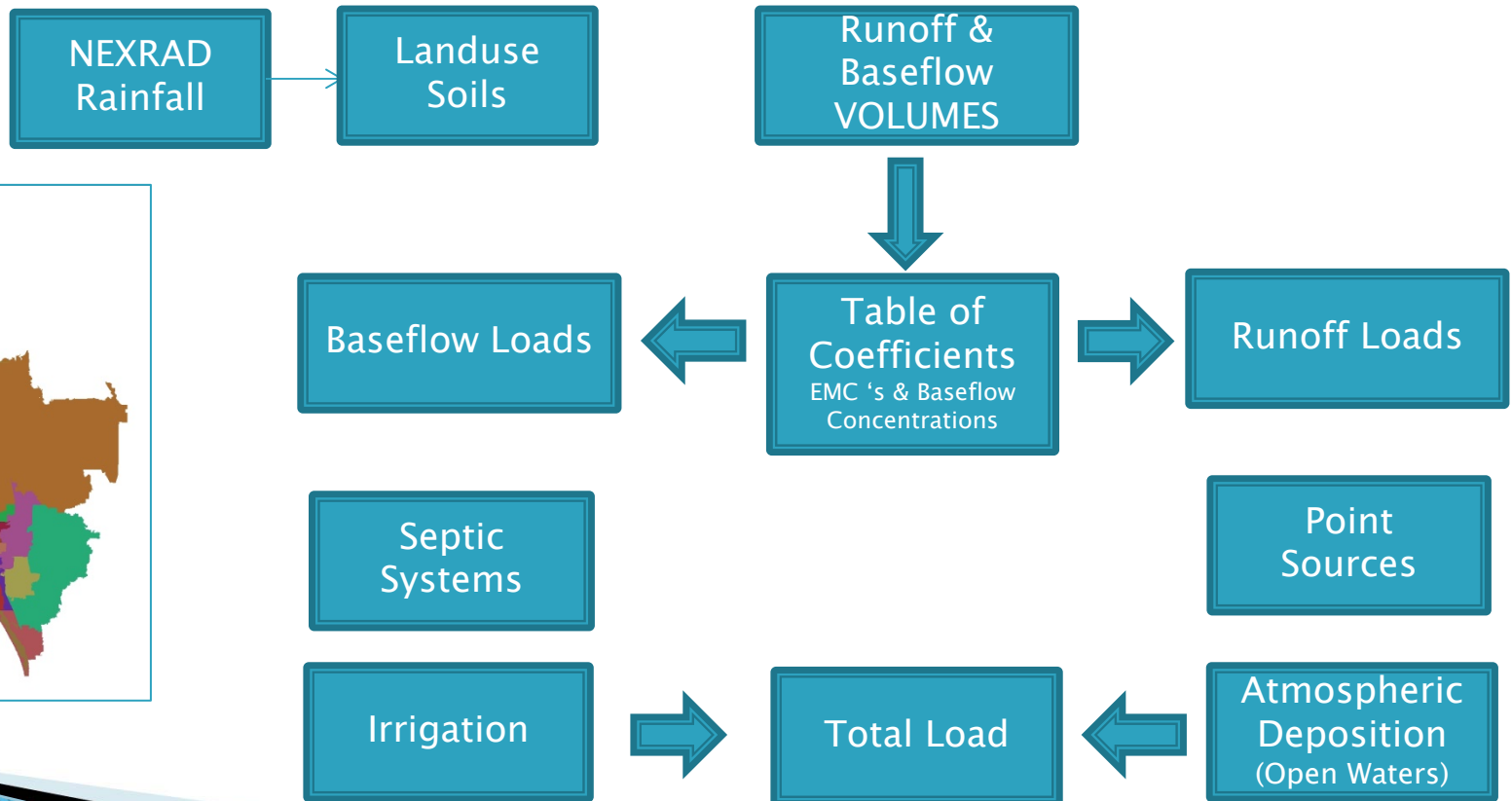
- Direct Runoff
- Baseflow
- Point Sources
- Septic Systems
- Irrigation
- Atmospheric Deposition

Pollutants

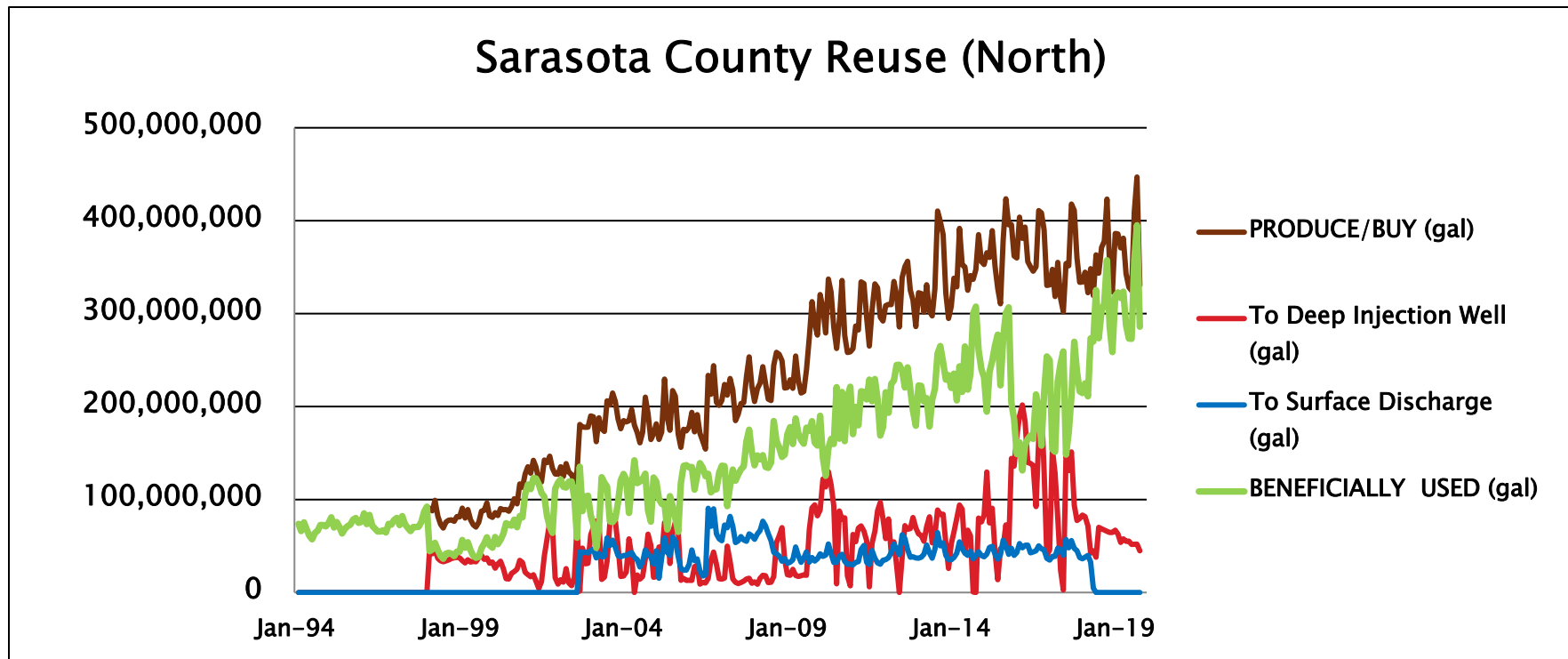
- Nutrients
 - Nitrogen
 - Phosphorus
- BOD, TSS, TDS
- Metals



SIMPLE Inputs

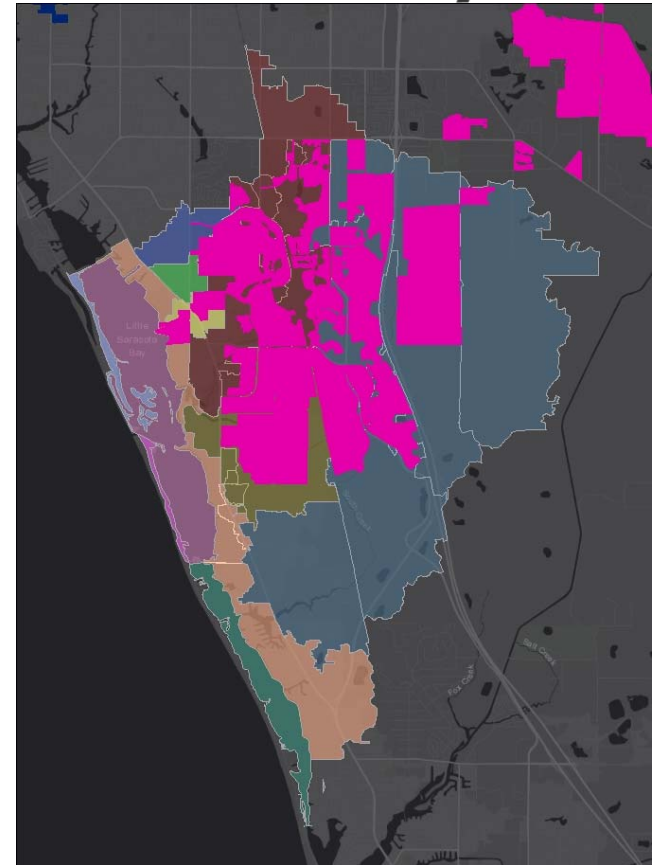


Recent Reclaimed Water Data



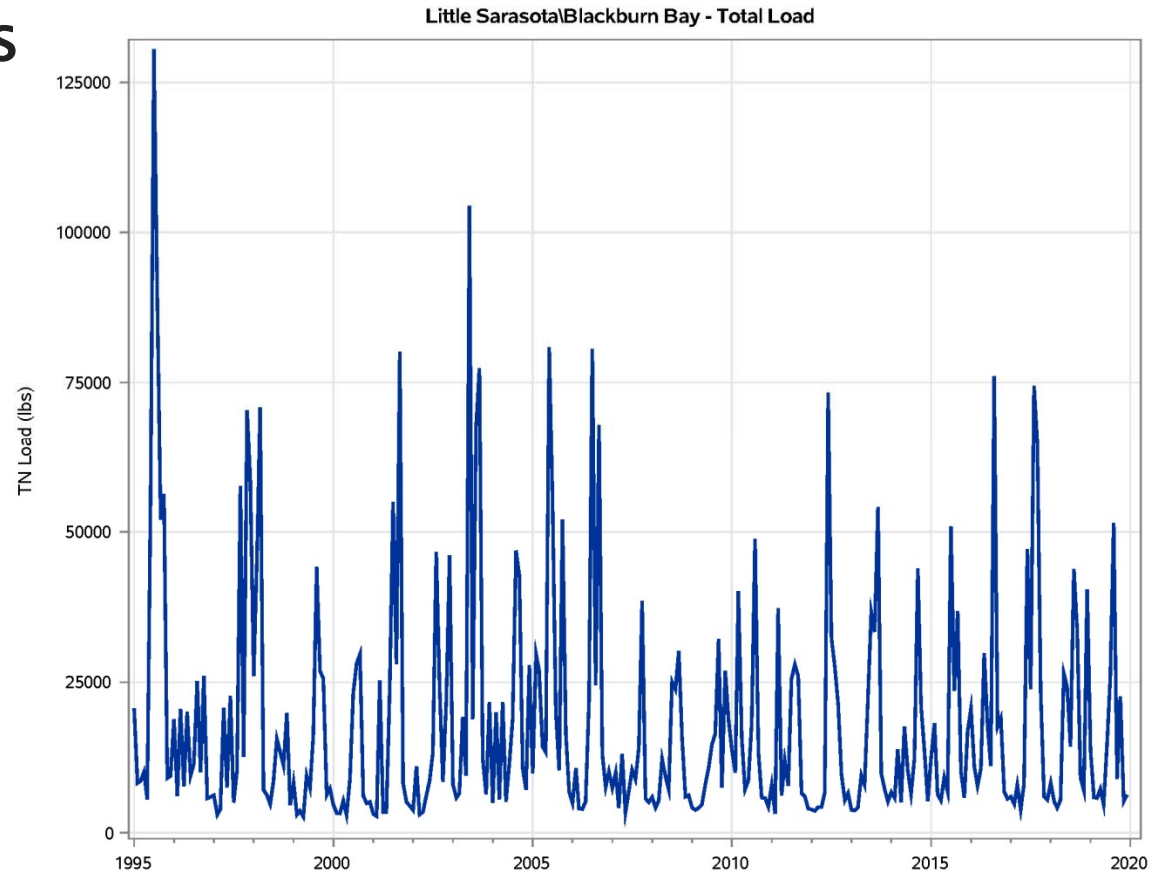
Little Sarasota \ Blackburn Bay

- Better data
 - Nutrient concentrations
 - Spatial Distribution
- Improved Reclaimed Loading Estimates

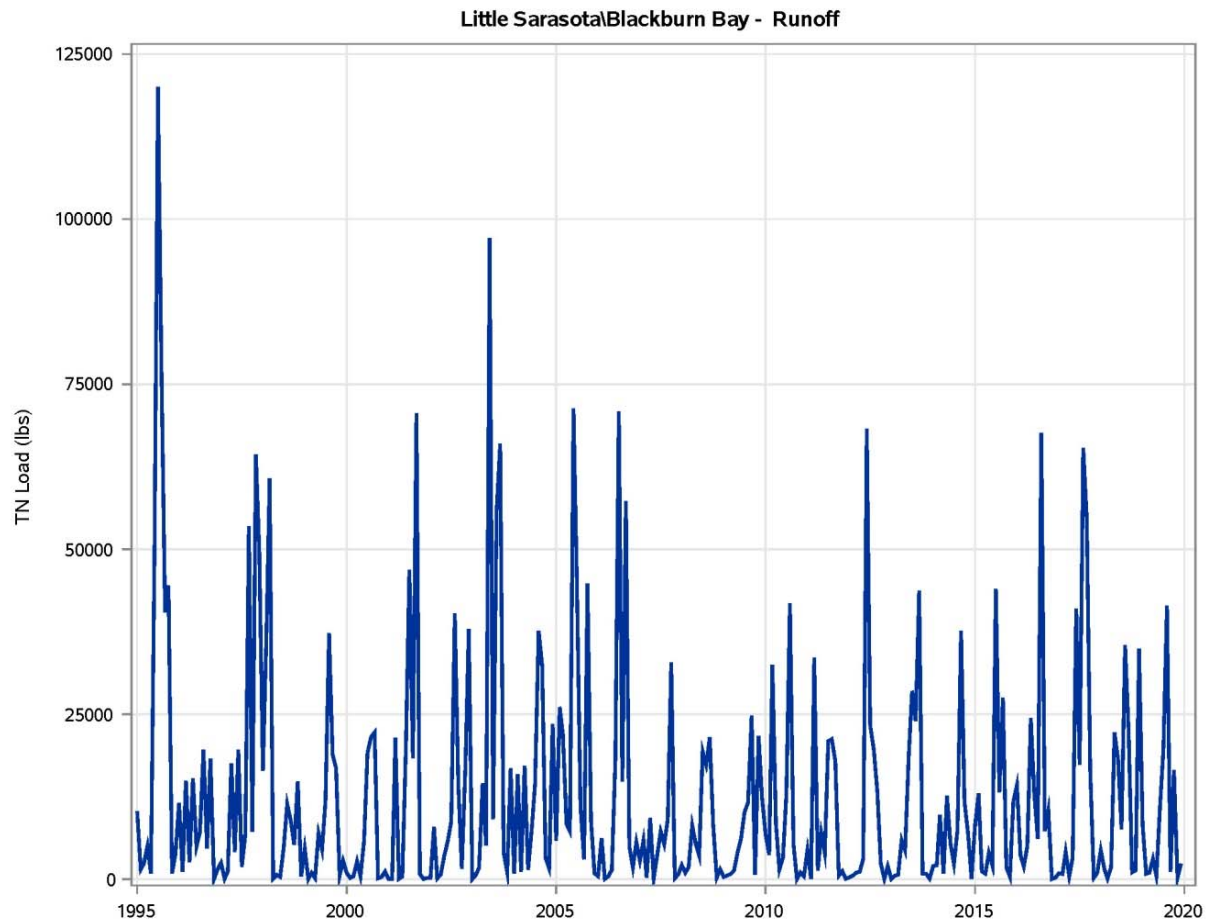


- Total Nitrogen Loads

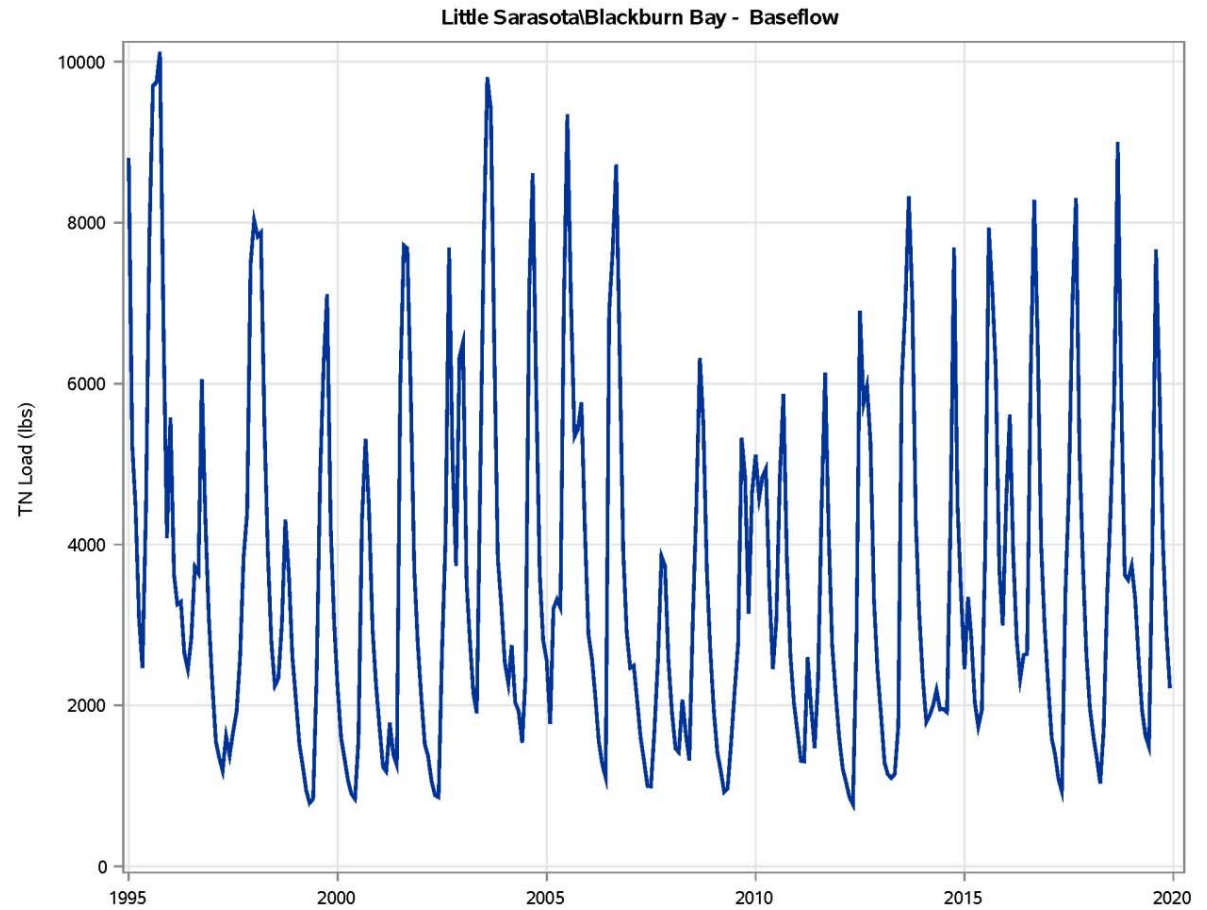
- Runoff
- Baseflow
- Point Sources
- Septics
- Reclaimed irrigation
- Atmospheric Deposition
- Accidental Releases



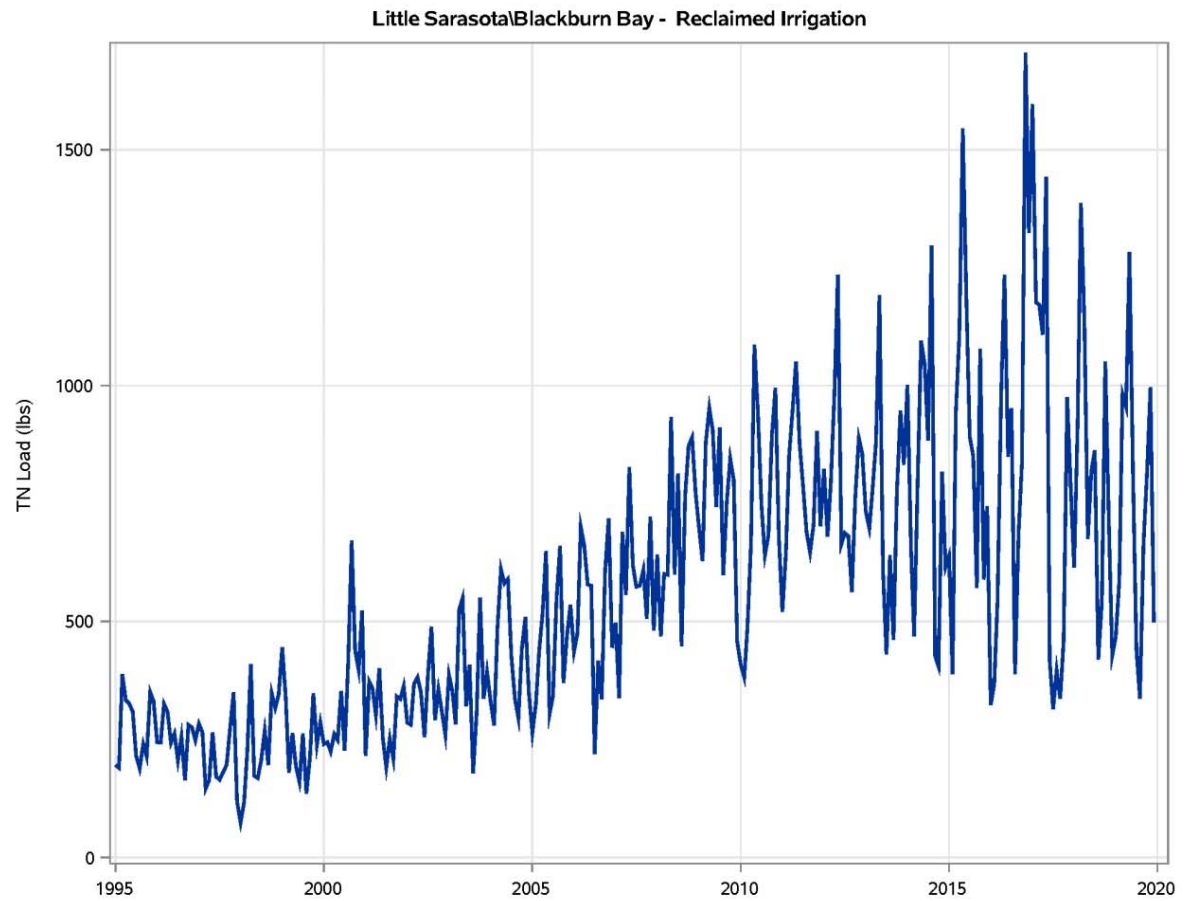
Runoff is the largest source



Baseflow* is also important



**Reclaimed
Irrigation
Loading has
Increased**



2010 – 2019 Loadings

Percent of Total Nitrogen Load by Source*

Runoff	Baseflow	Septic Systems	Reclaimed Irrigation	Atmospheric Deposition
65.8	20.9	6.2	4.7	2.2

*Point Sources account for < 0.5 %



Proportion of the Total Load

Source	Dry Season	Wet Season
Runoff	49.4	76.7
Baseflow	28.8	15.7
Septic Systems	10.4	3.4
Reclaimed Irrigation	8.5	2.2
Atmospheric Deposition	2.7	1.8

Questions?



Janicki Environmental, Inc.

