



Hydrologic Monitoring in the Central Pine Barrens



Pine Barrens Commission Meeting
Wednesday, February 27, 2019

Irene Fisher and Amy Simonson

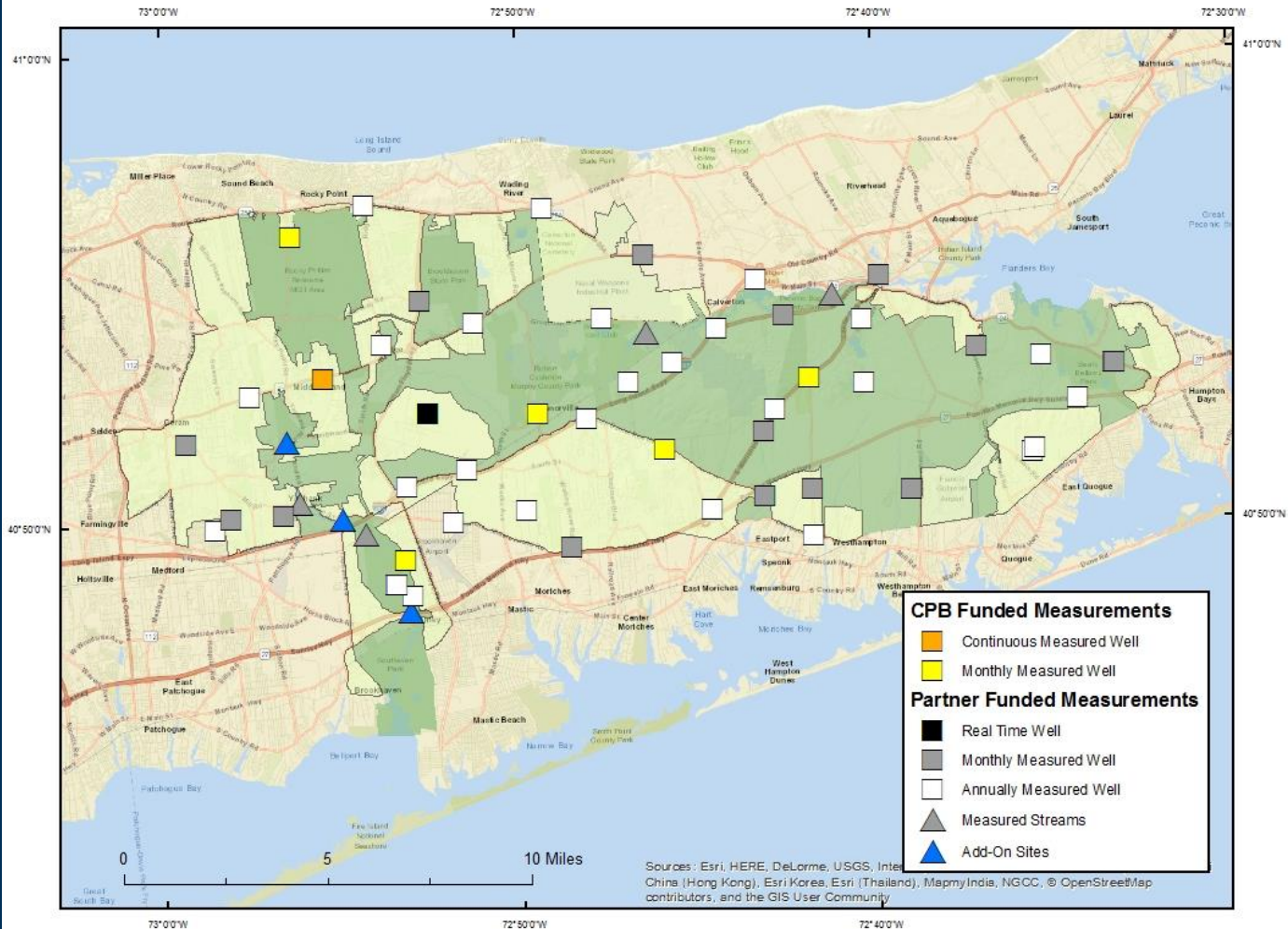
Objective:

Expand and operate a comprehensive water-resources monitoring program for the Central Pine Barrens region

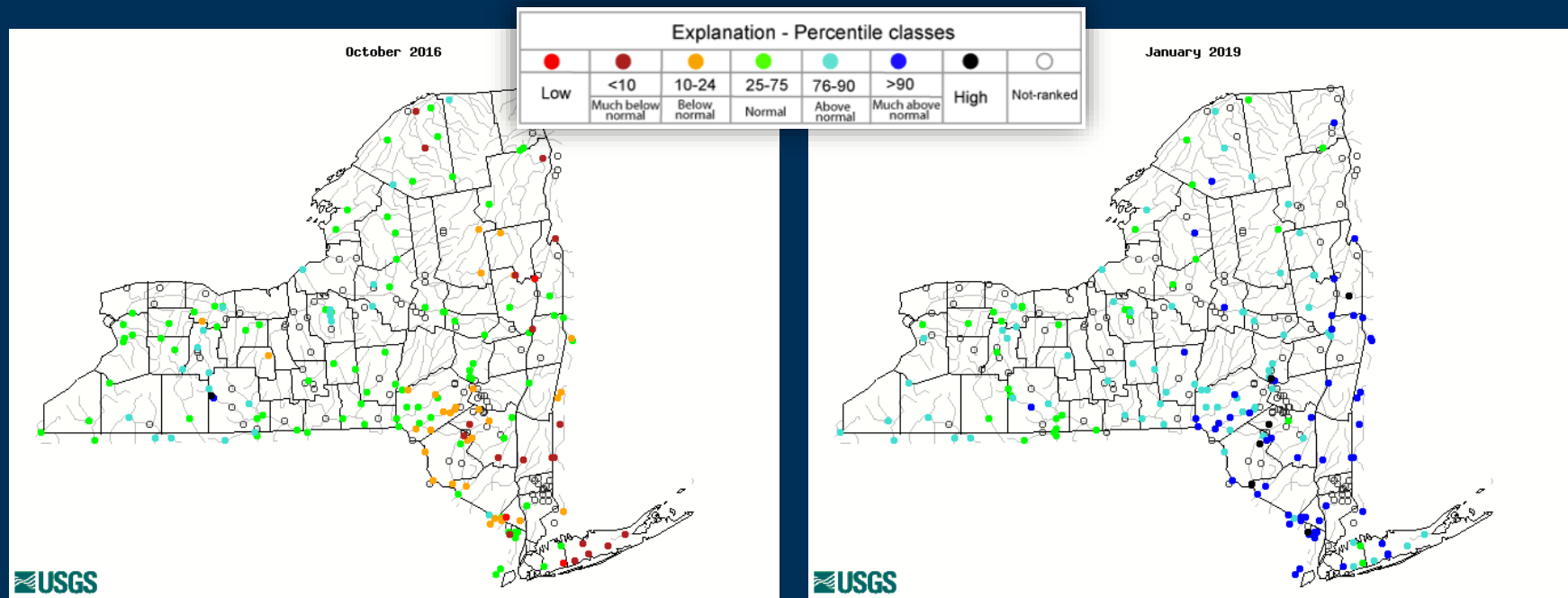
- Publicly accessible database of hydrologic conditions
- Baseline of water-resources conditions to assess hydrologic changes and trends
- Provide a data resource to monitor ecohydrologic stress



Water Quantity within the Central Pine Barrens



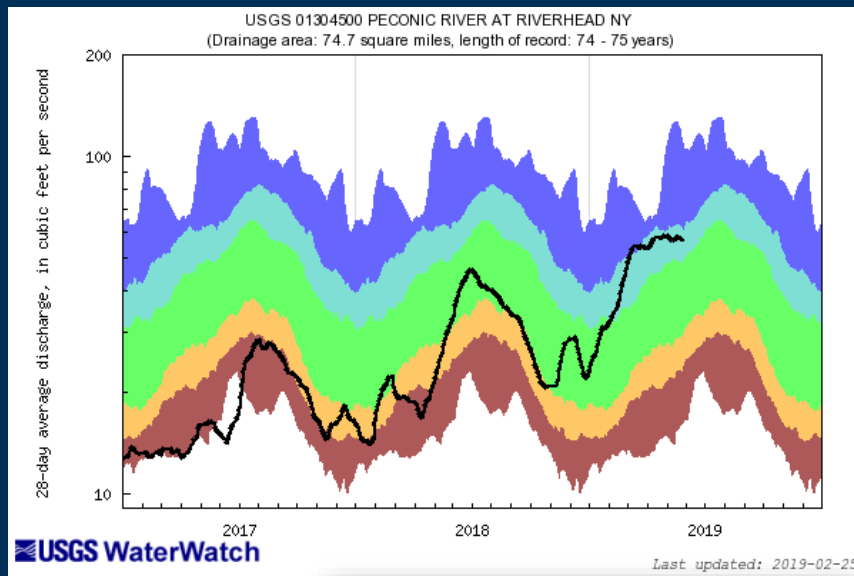
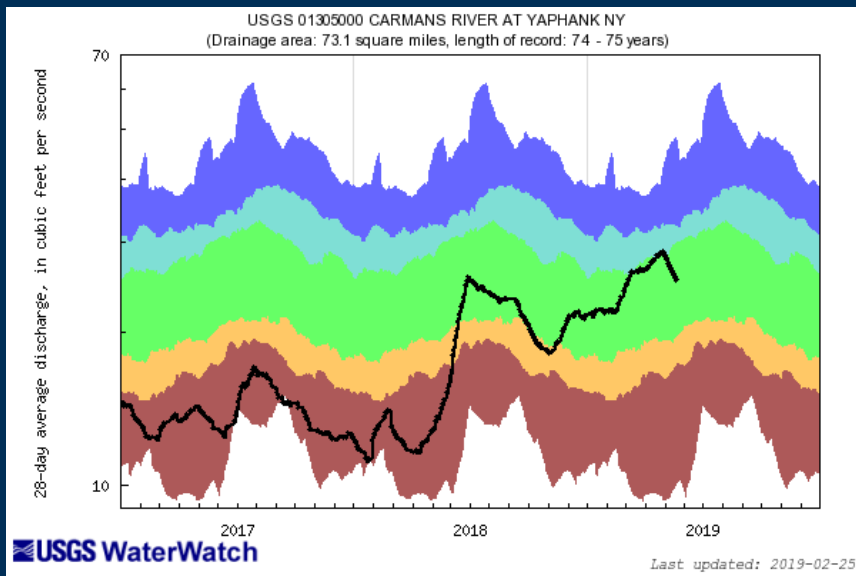
Comparison of Streamflow Maps



<https://waterwatch.usgs.gov/>

Updated: 2019-02-26

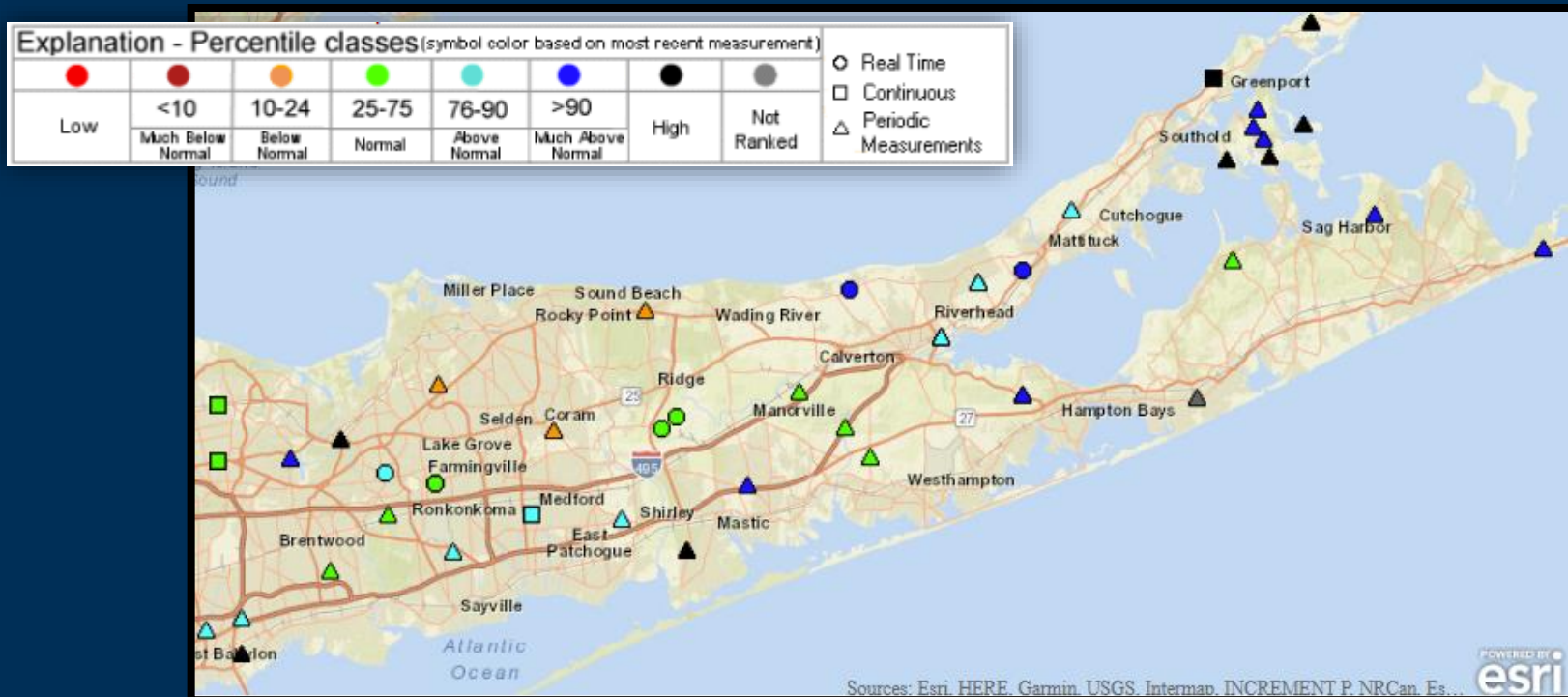
Carmans & Peconic Hydrographs – 3 years



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

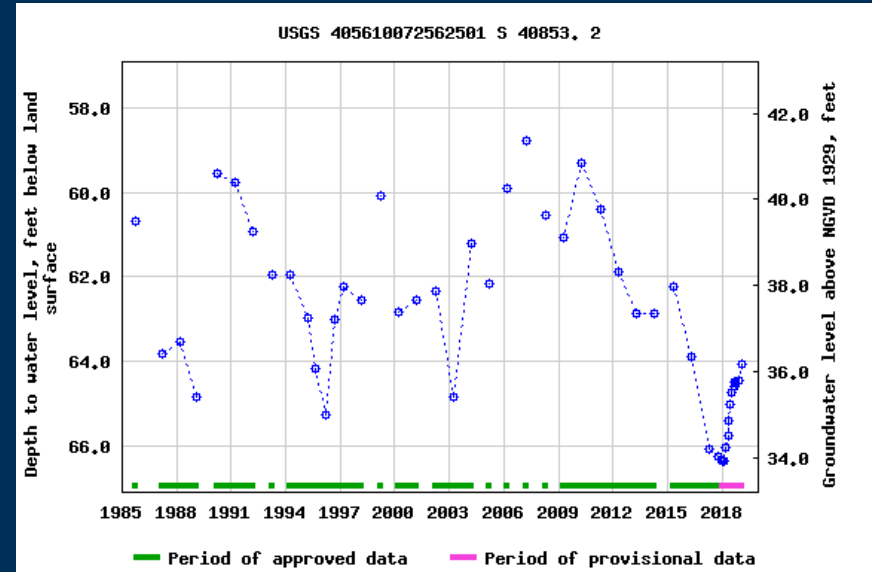
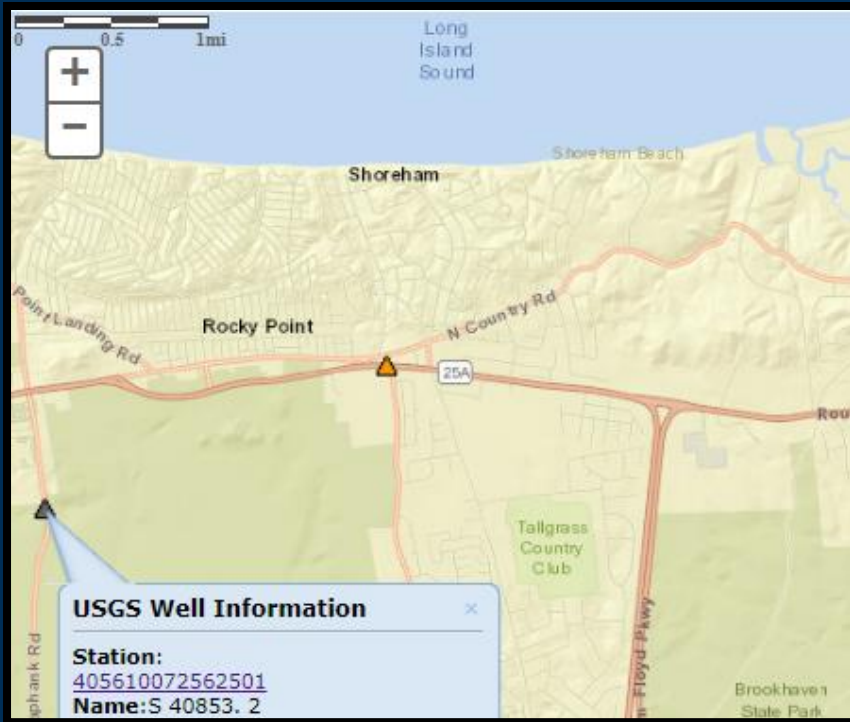
<https://waterwatch.usgs.gov/>

Groundwater Conditions (20+ Years or More)

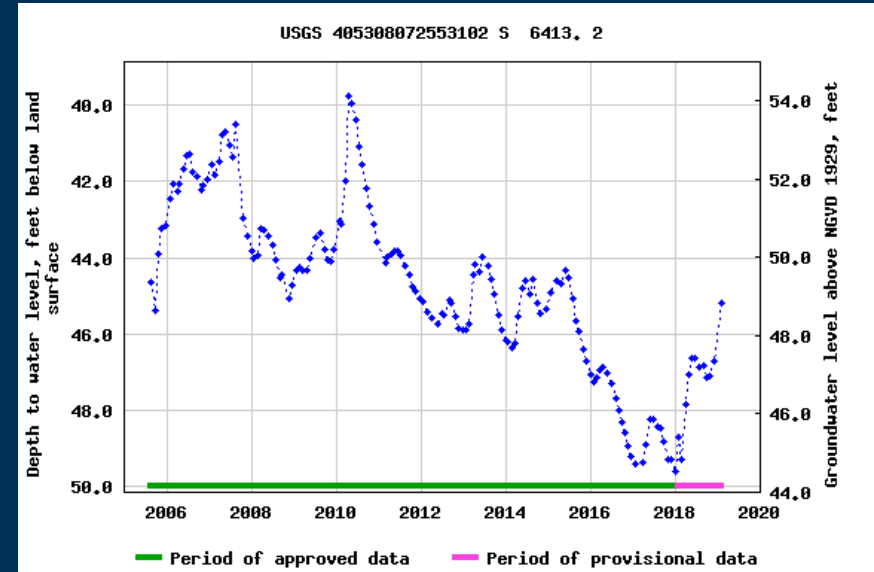


<https://groundwaterwatch.usgs.gov/>

S 40853.2 – Groundwater Measurements

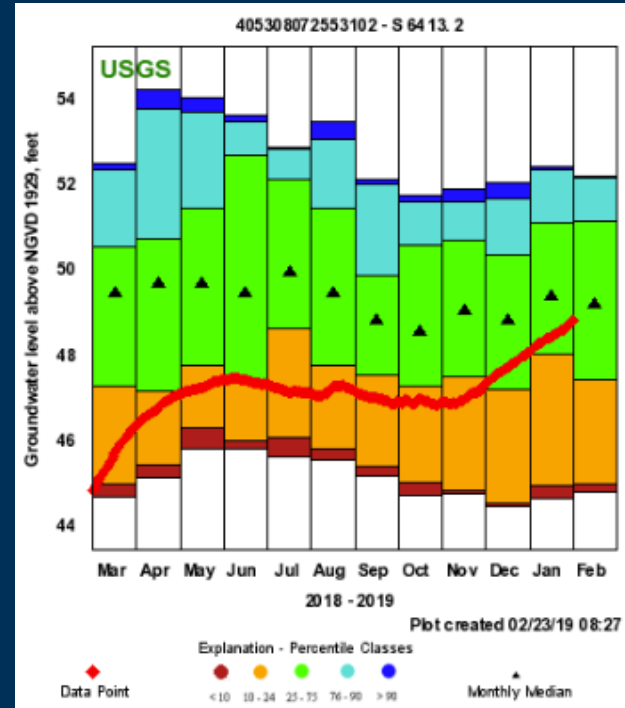


S 6413. 2 – Groundwater Measurements



<https://groundwaterwatch.usgs.gov/>

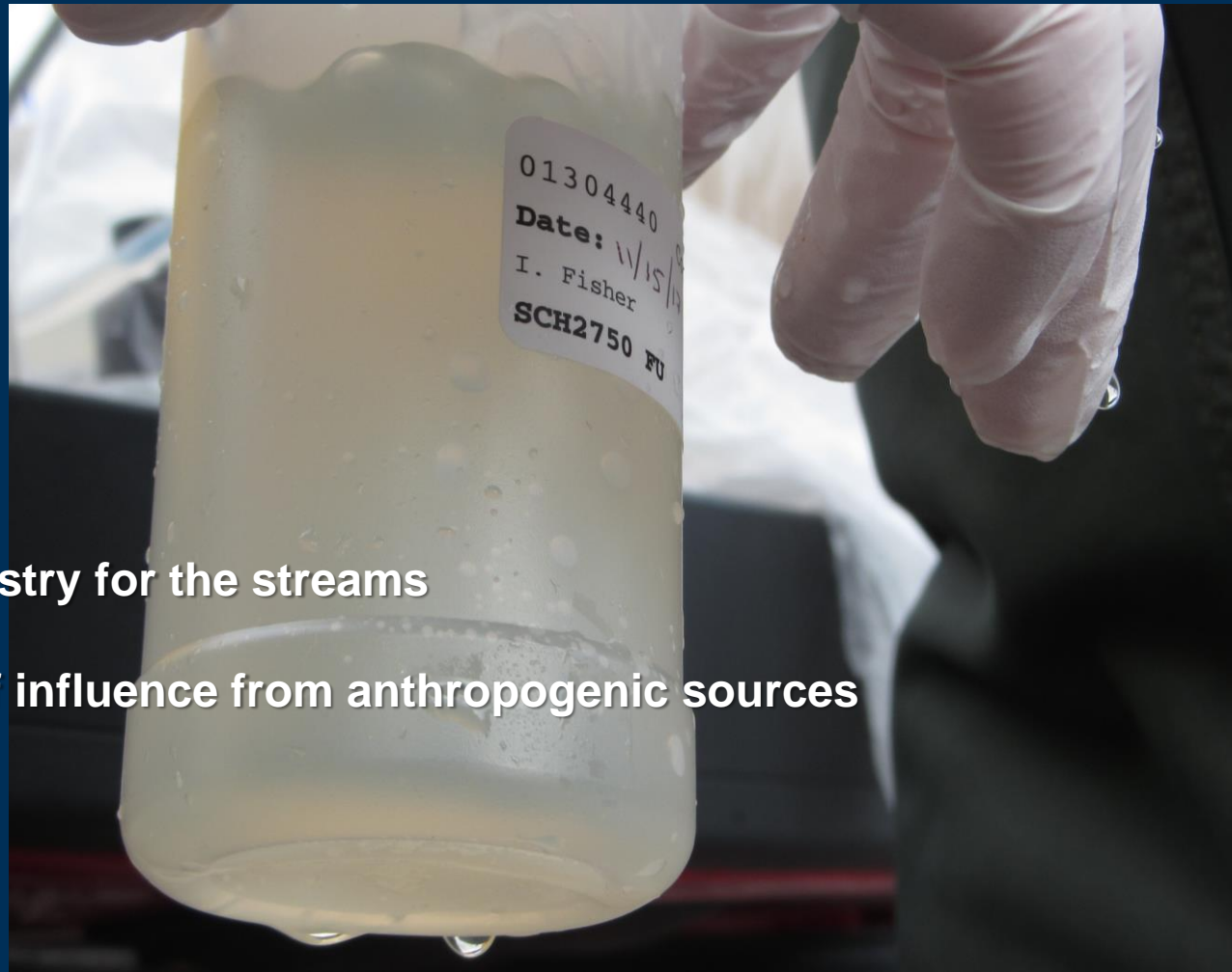
S 6413. 2 – Groundwater Measurements



Water Quality

Develop baseline chemistry for the streams

Determine the degree of influence from anthropogenic sources



Stream WQ Frequency

Up to 4 visits per year:

- Winter (*Jan-Mar*) *Carmans
- Spring (*Apr-Jun*)
- Summer (*Jul-Sep*) *Carmans
- Fall (*Oct-Dec*)

Nutrients, inorganics and physical parameters every visit

Pharmaceuticals and pesticides, once a year

Background nutrient concentrations in streams from undeveloped areas

ESTIMATES OF NATIONAL BACKGROUND NUTRIENT CONCENTRATIONS

Nutrient	Background concentration (mg/L)
Total nitrogen in streams [Data from 28 watersheds in first 20 Study Units]	1.0
Nitrate in streams ⁽²⁶⁾	0.6
Ammonia in streams ⁽²⁶⁾	0.1
Nitrate in shallow ground water ⁽²⁷⁾	2.0
Total phosphorus in streams ⁽²⁶⁾	0.1
Orthophosphate in shallow ground water [Data from 47 wells in first 20 Study Units]	0.02

Source: USGS
Circular 1225

(<https://pubs.usgs.gov/circ/circ1225/>)



Carmans River WQ

Analyte (mg/L)	Bartlett	Upper Lake (*median)	Lower Lake	Gage (*median)	Tidal
Nitrate as N (fil)	0.05	1.89	1.80	1.72	1.70
Total N (fil)	0.27	1.96	2.08	1.92	1.82
Total N (unfil)	0.30	2.14	4.96	2.12	1.65

*median value of four samples



Peconic River WQ

Analyte (mg/L)	Connecticut Ave	Gage
Nitrate, as N (fil)	0.06	0.28
Total N (fil)	0.89	0.72
Total N (unfil)	1.06	0.81

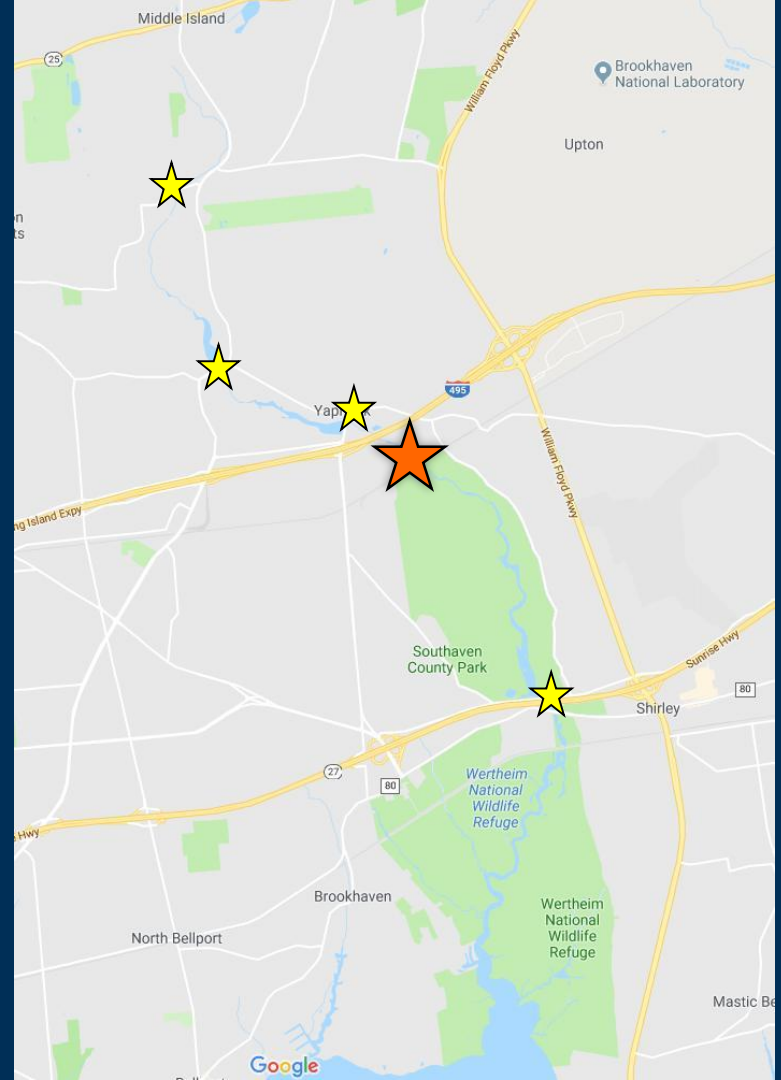
Average of two samples: Fall and Spring



Carmans River WQ Highlights

November 2017 organic sample collected at Gage only:

- 2 pharmaceuticals
- 4 pesticides:
 - insecticide, fungicide, and legacy insecticide degradates



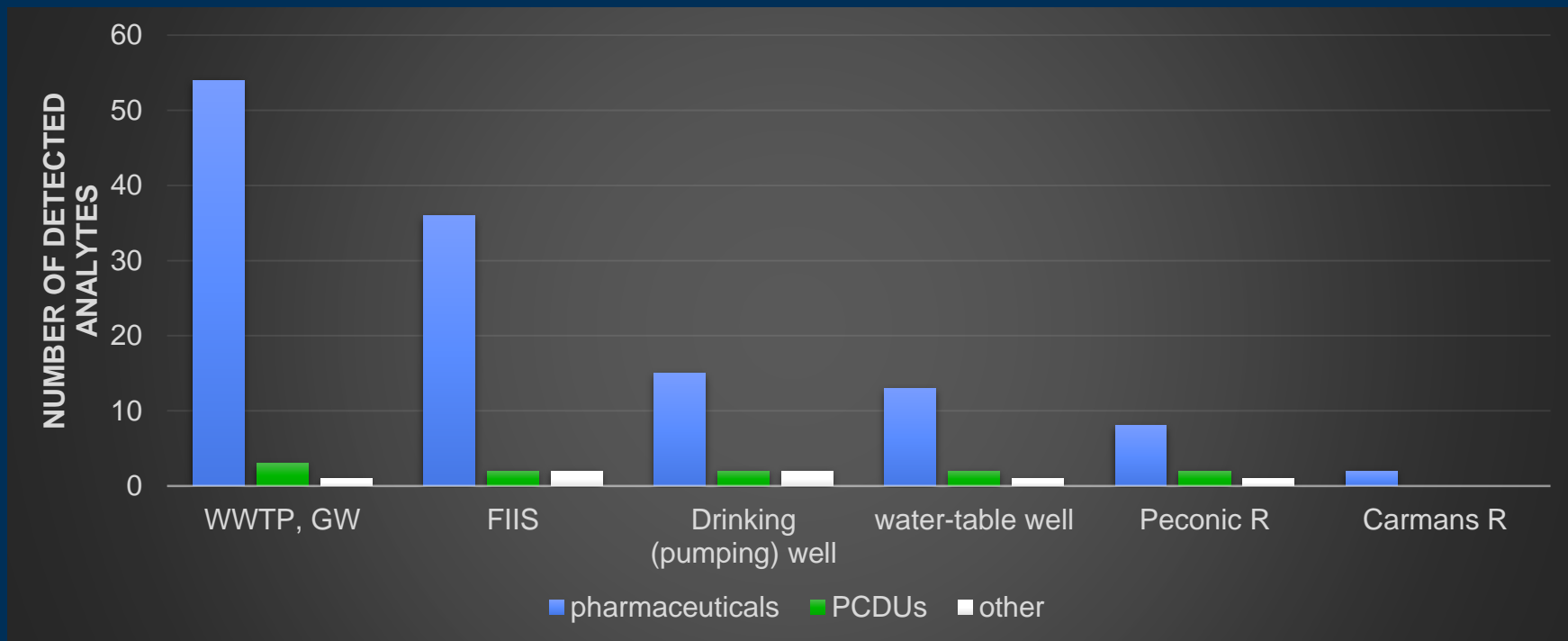
Peconic River WQ Highlights

Downstream:
6 pharms
2 PCDUs
1 other
4 pests

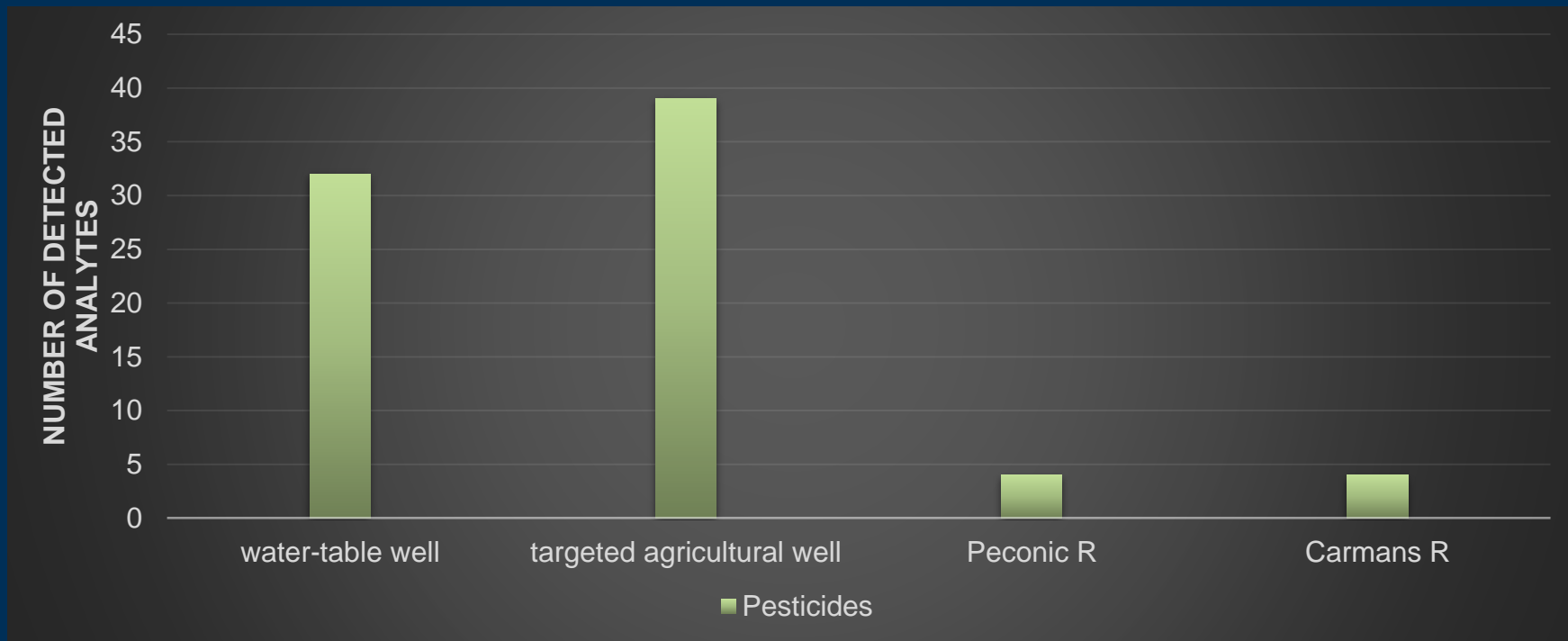
Upstream:
2 pharms
1 PCDUs
1 other



Comparing Stream WQ to Long Island GW WQ

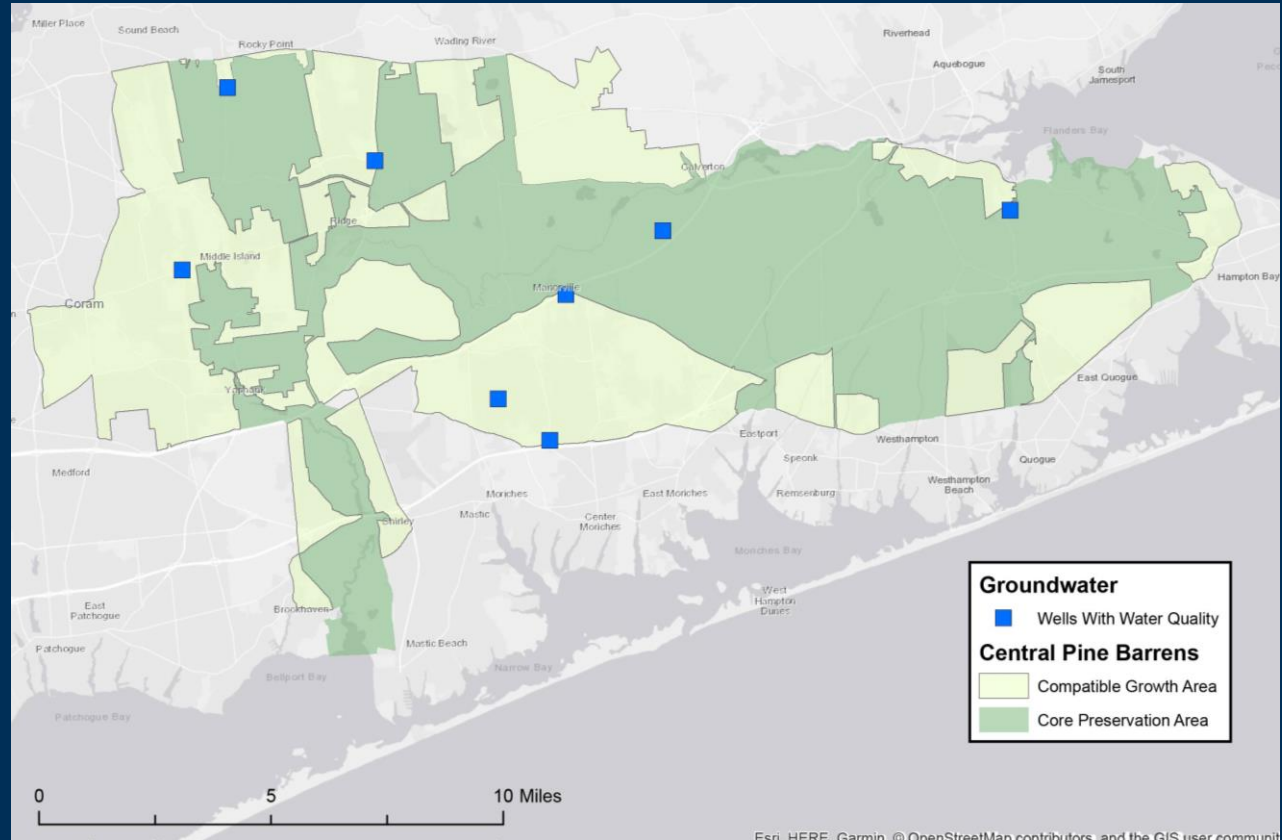


Comparing Stream WQ to Long Island GW WQ



Groundwater Quality Monitoring 2018

- Nutrients
- Inorganics
- Pesticides
- Pharmaceuticals
- VOCs (1,4-dioxane)
- PFASs



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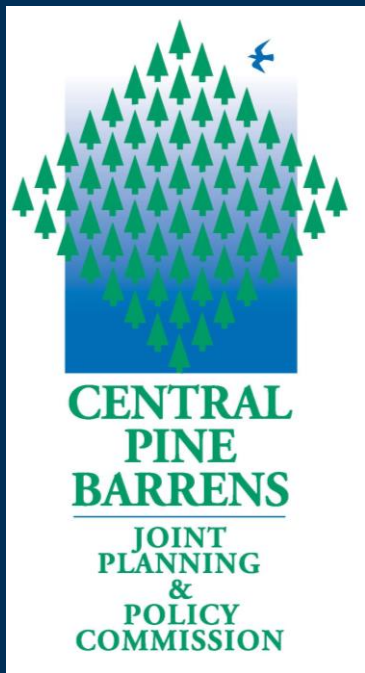
**no GW plans for 2019*

Deliverables:

- Regular presentations on project progress
- Website with data mapper
- Annual data summary; available on project website



Partners



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