USGS Water-Quality Network

Began as ambient monitoring network

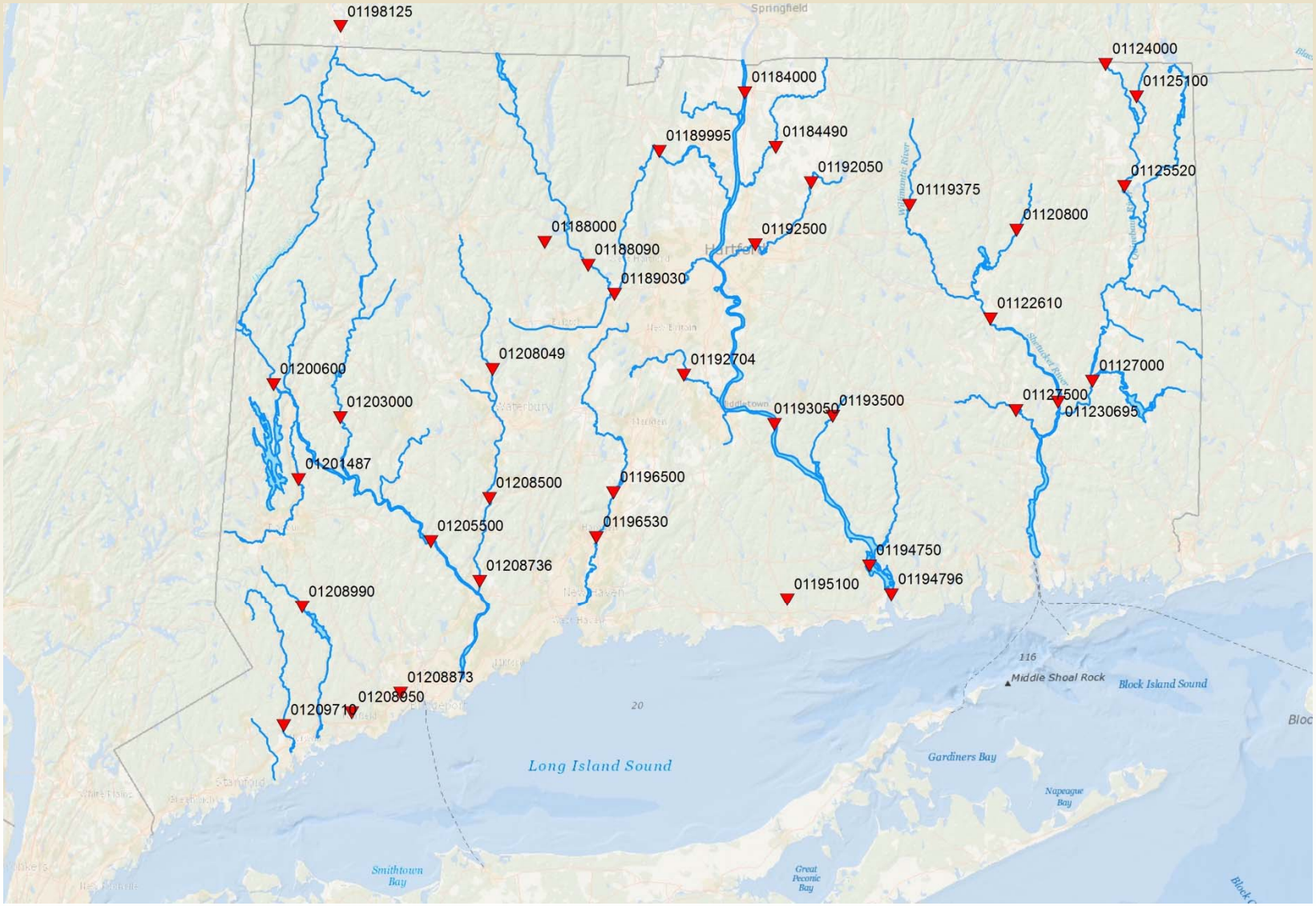
Data sets on nutrients and major ions back to early 1970s. High quality trace metal data for about the last 10-12 years.

Serves multiple purposes

Enhanced in 2008 for nutrients- sampling sites/frequency

USGS

USGS Water Quality Network



USGS

Site Number	Site Name	Stream Gage	Nutrients	Major Ions and Trace Metals	Continuous Measurements
01119375	WILLIMANTIC R AT MERROW, CT	Y	8	8	
01120800	NATCHAUG R AT CHAPLIN CT	Y	12	8	
01122610	SHETUCKET R AT SOUTH WINDHAM, CT	Y	12		
011230695	SHETUCKET RIVER AT TAFTVILLE, CT	Y	12		
01124000	QUINEBAUG RIVER AT QUINEBAUG, CT	Y	12	8	
01125100	FRENCH RIVER AT NORTH GROSVENORDALE, CT	Y	8	8	
01125520	QUINEBAUG RIVER AT COTTON BRIDGE ROAD NR POMFRET	N	8	8	
01127000	QUINEBAUG RIVER AT JEWETT CITY, CT	Y	12	8	
01127500	YANTIC RIVER AT YANTIC, CT	Y	12		
01184000	CONNECTICUT RIVER AT THOMPSONVILLE, CT	Y	30	8	
01184490	BROAD BROOK AT BROAD BROOK, CT	Y	8	8	
01188000	BUNNELL (BURLINGTON) BROOK NEAR BURLINGTON, CT	Y	12	4	
01188090	FARMINGTON RIVER AT UNIONVILLE, CT	N	4	4	
01189030	PEQUABUCK R AT FARMINGTON, CT	Y	8	8	
01189995	FARMINGTON RIVER AT TARIFFVILLE, CT	Y	12	8	
01192050	HOCKANUM R AT ROCKVILLE, CT.	N	8	8	
01192500	HOCKANUM RIVER NEAR EAST HARTFORD, CT	Y	8	8	
01192704	MATTABESSET RIVER AT ROUTE 372 AT EAST BERLIN	N	8	8	
01193050	CONNECTICUT RIVER AT MIDDLE HADDAM, CT	Tidal stage	>50		UV nitrate, CDOM, turbidity
01193500	SALMON RIVER NEAR EAST HAMPTON, CT	Y	12	4	
01194750	CONNECTICUT RIVER AT ESSEX, CT	Tidal stage			Salinity
01194796	CONNECTICUT RIVER AT OLD LYME, CT	Tidal stage			Salinity
01195100	INDIAN RIVER NEAR CLINTON, CT	Y	12		
01196500	QUINNIPIAC RIVER AT WALLINGFORD, CT	Y	12	8	
01196530	QUINNIPIAC R AT NORTH HAVEN, CT	N,tidal	8	8	
01198125	HOUSATONIC RIVER NEAR ASHLEY FALLS, MA	Y	12	8	
01200600	HOUSATONIC RIVER NEAR NEW MILFORD, CT	Y	12	4	
01201487	STILL RIVER AT ROUTE 7 AT BROOKFIELD CENTER, CT	Y	12	8	
01203000	SHEPAUG R NR ROXBURY, CT	Y	8	8	
01205500	HOUSATONIC RIVER AT STEVENSON, CT	Y	12	4	
01208049	NAUGATUCK RIVER NR WATERVILLE,CT.	N	8	8	
01208500	NAUGATUCK RIVER AT BEACON FALLS, CT	Y	12	8	
01208736	NAUGATUCK R AT ANSONIA, CT	N,tidal	8	8	
01208873	ROOSTER RIVER AT FAIRFIELD, CT	Y	12		
01208950	SASCO BROOK NEAR SOUTHPORT, CT	Y	12		
01208990	SAUGATUCK RIVER NEAR REDDING, CT	Y	12	4	
01209710	NORWALK RIVER AT WINNIPAUK,CT.	Y	36	8	

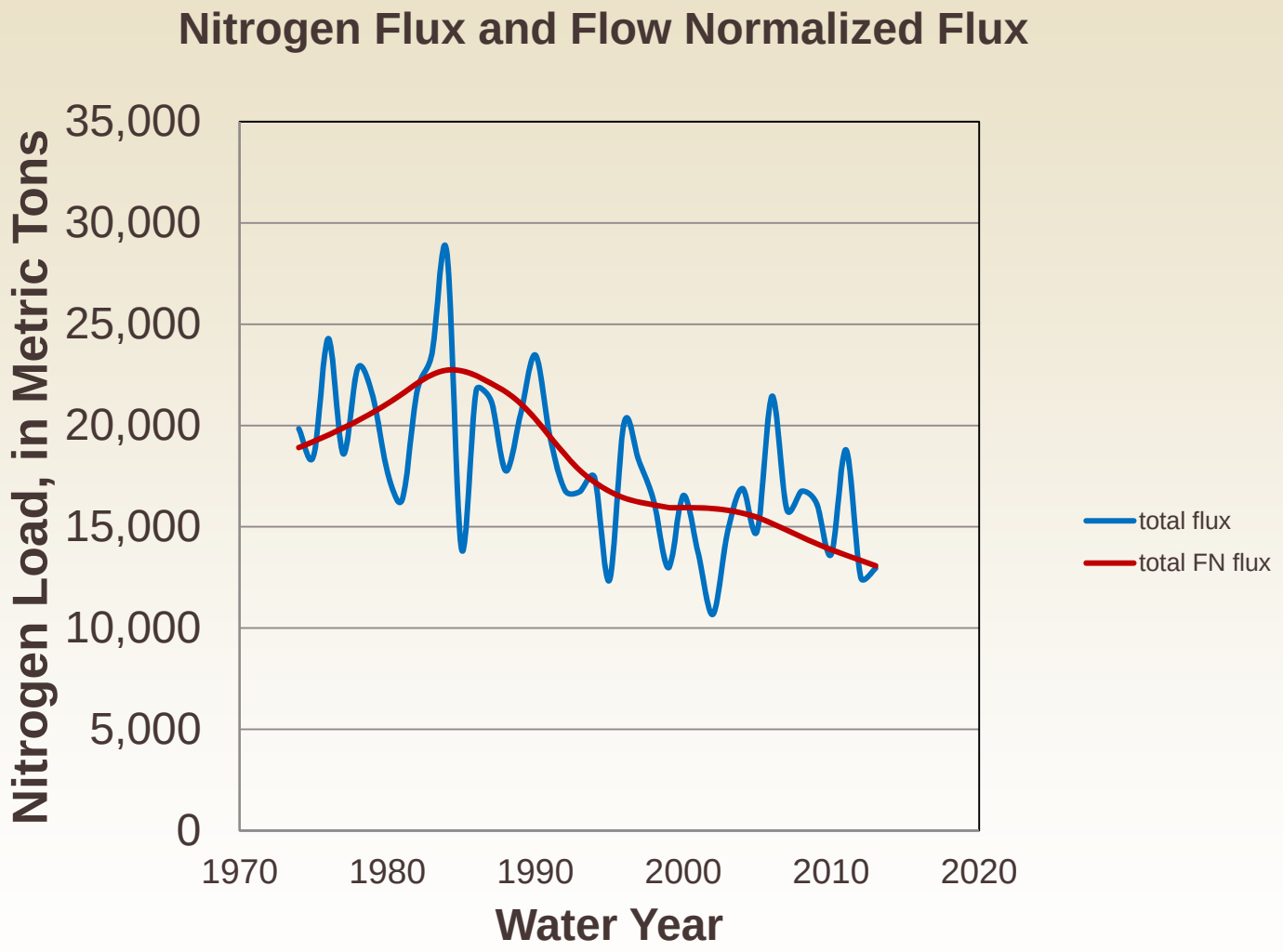
USGS

Strengths

- Long-term data set
- Similar collection in the future will allow for some trend and load analysis
- Many sites sampled
- Large percentage of the load from CT is accounted
- Verification of changes due to management programs

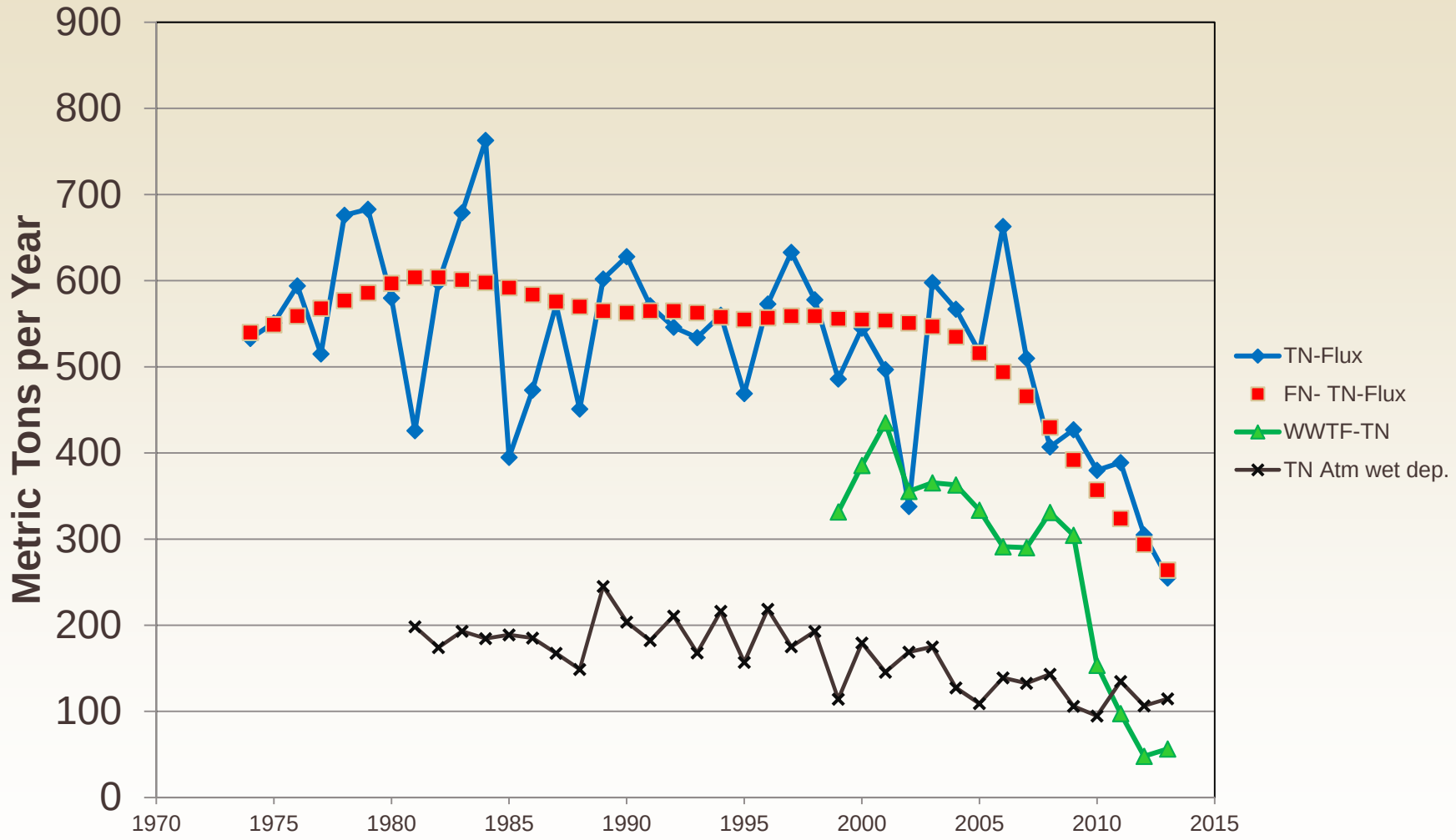
USGS

Sum of Results- Major Fall Line Stations



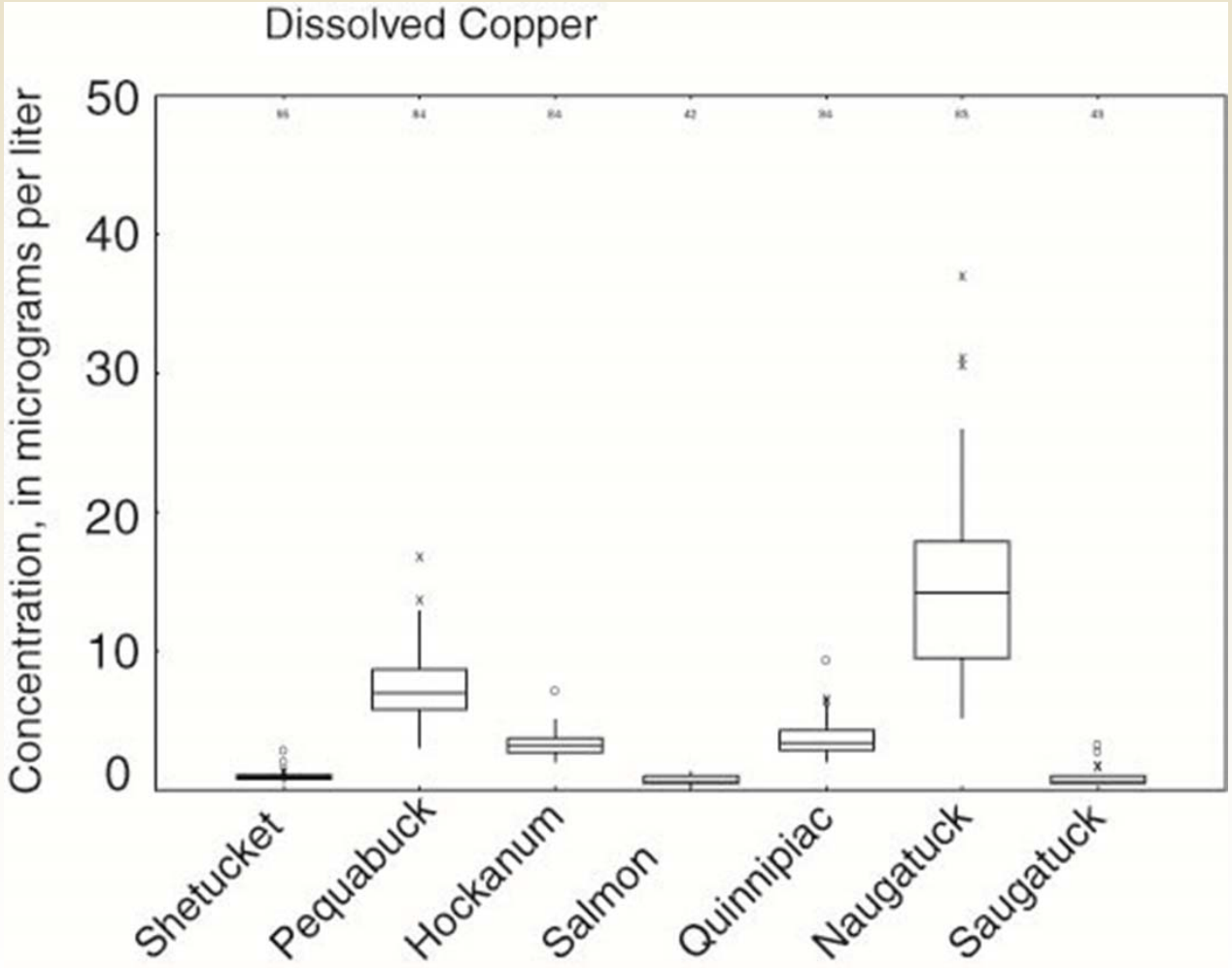
USGS

Example- Major Change Quinnipiac River Total Nitrogen



USGS

Ranges in Concentrations



USGS

Limits

- Daytime sampling
- Relatively infrequent storm sampling
- Sampling intervals from 4-30 times per year. Fall line stations now at least monthly.
- Some laboratory method changes with time
- Funding relatively static
- Few sites with long-term data that are affected by only nonpoint source nutrients

USGS

Working toward continuous nutrient monitoring for better load information

USGS

Working toward continuous nutrient monitoring for better load information

- **Streamflow and Total Nitrogen Surrogate Development for the Tidally-Affected Lower Connecticut River**

  Use of multiple sensors and frequent laboratory sampling to develop methods to predict total nitrogen from these measurements

Tidal Flow Acoustic

Turbidity

UV nitrate

FDOM

Refrigerated Isco Sampler

USGS

Use of multiple sensors and frequent laboratory sampling to develop methods to predict total nitrogen from these measurements

Tidal Flow Acoustic

Turbidity

UV nitrate

FDOM

Refrigerated Isco Sampler

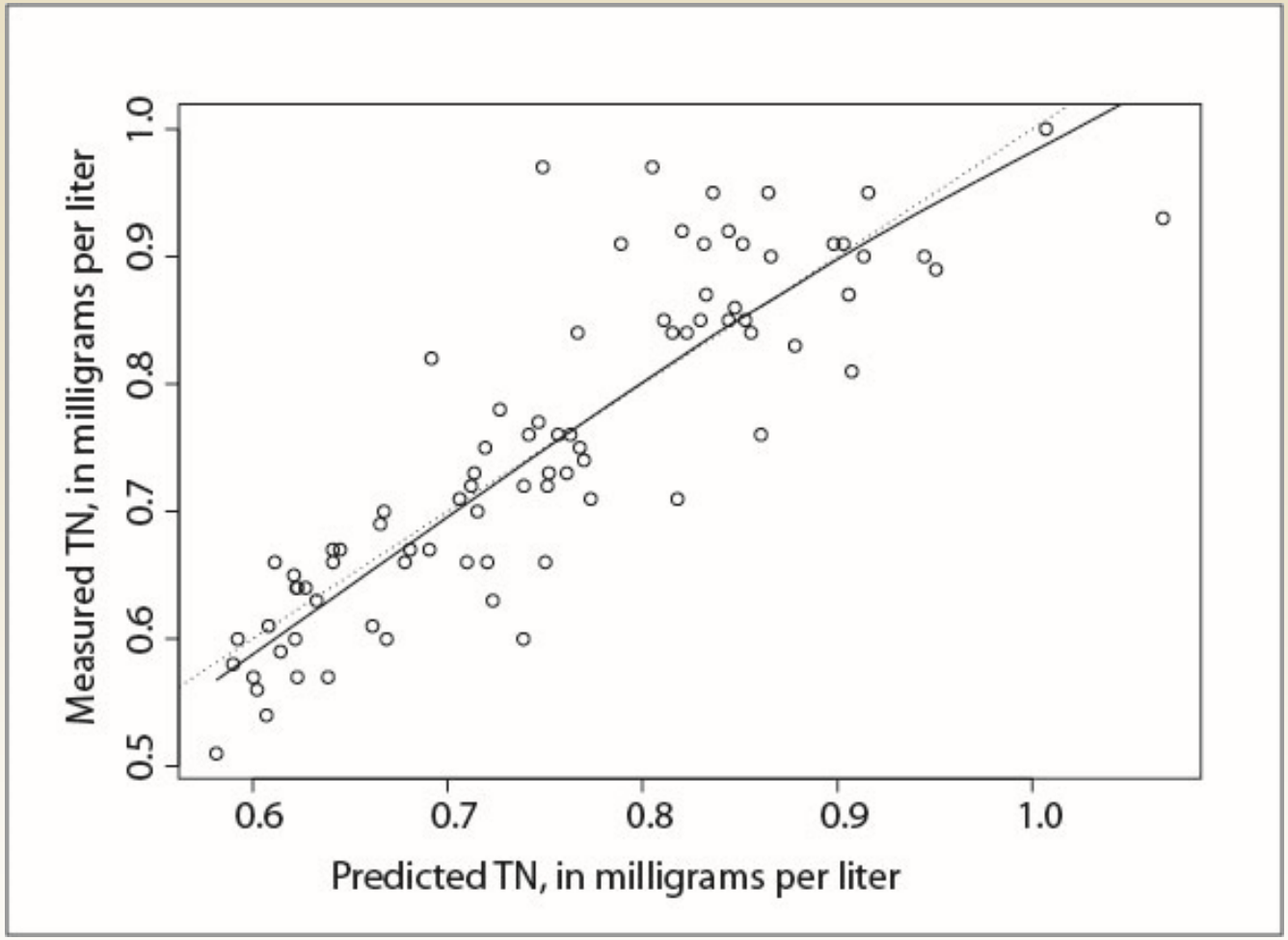
Working toward continuous nutrient monitoring for better load information

Streamflow and Total Nitrogen Surrogate Development for the Tidally-Affected Lower Connecticut River

USGS

The site is at Middle Haddam, Connecticut in a tidal reach of the Connecticut River

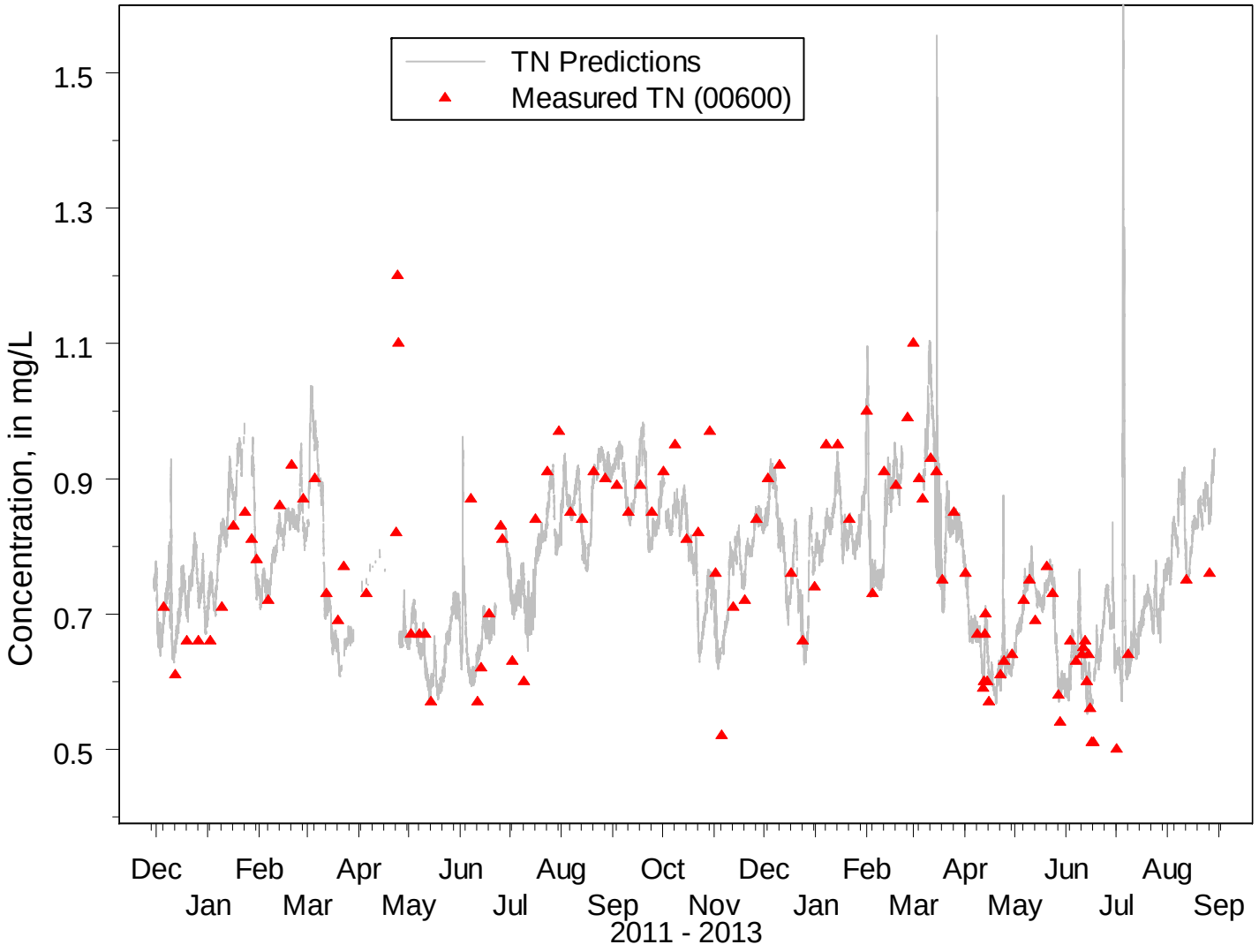
USGS



The preliminary model includes the following regression equation:

TN = 0.0502+ 0.0023(Specific Conductance)+0.0036(Uncorrected FDOM)+0.6584(UV Nitrate)+0.0001(Turbidity^2)

USGS


TN Predictions
Measured TN (00600)
Concentration, in mg/L
1.5
1.3
1.1
0.9
0.7
0.5
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
2011 - 2013

USGS