Northeast Drought Assessment

Streamflows and Groundwater Levels in New York

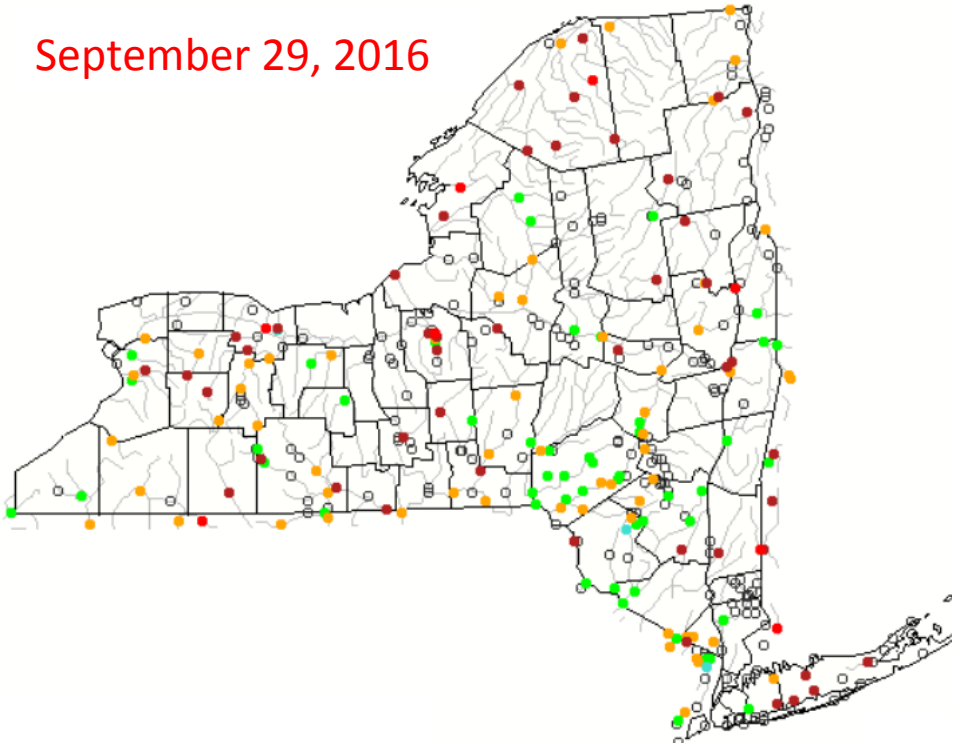
February 27, 2017

William Coon, Hydrologist

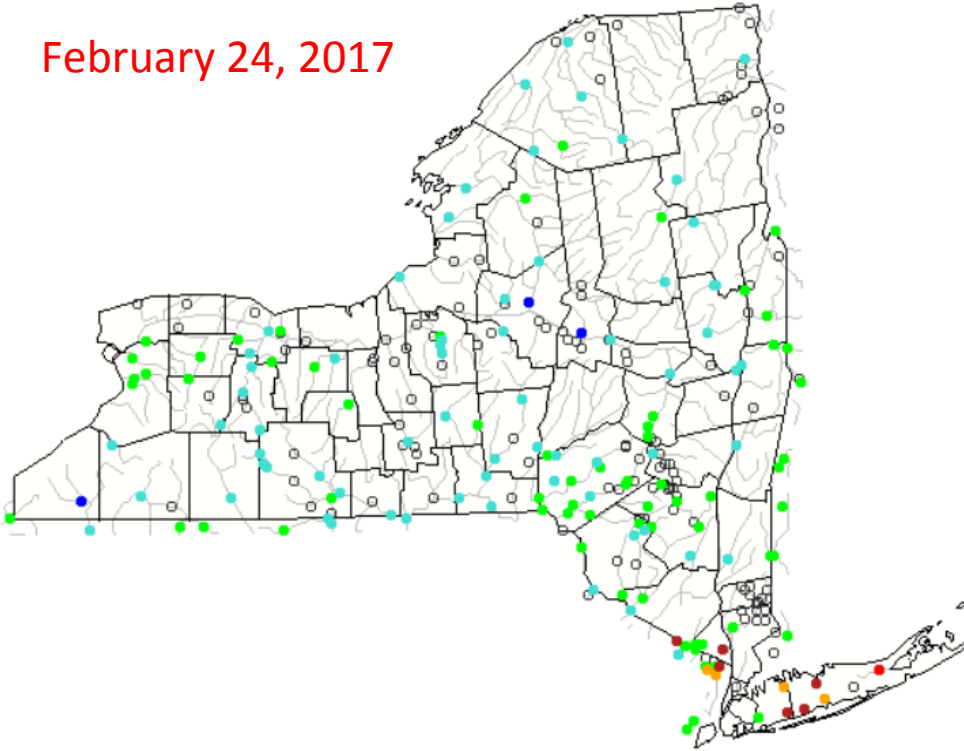
USGS
science for a changing world

Daily Streamflow

September 29, 2016



February 24, 2017



Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

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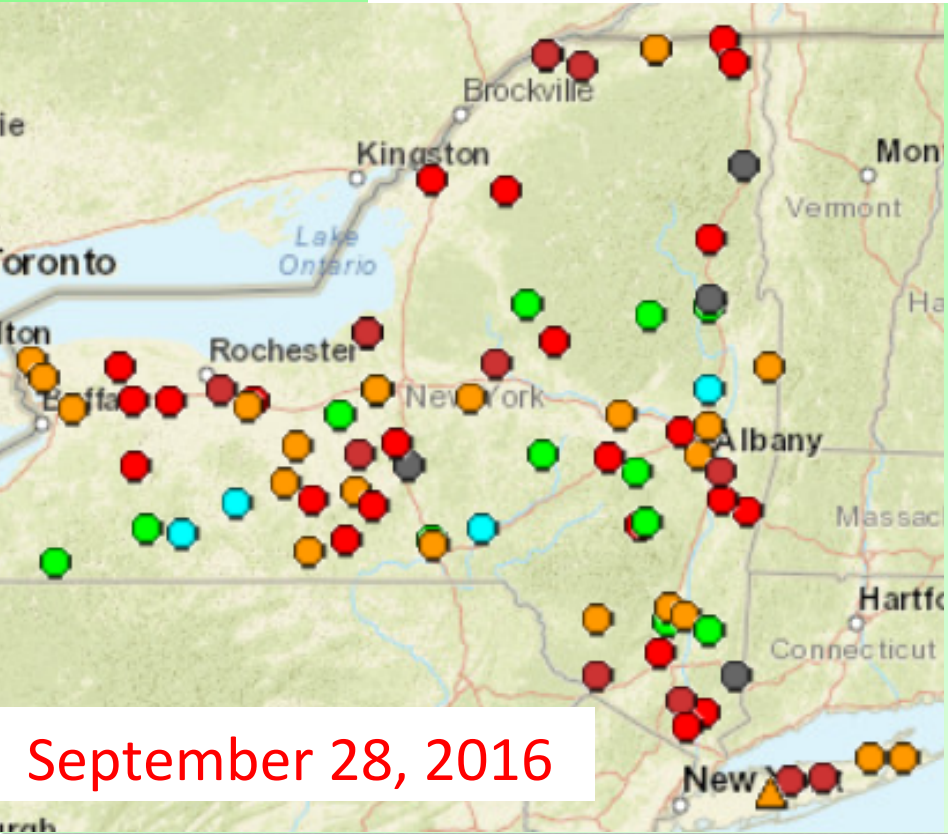
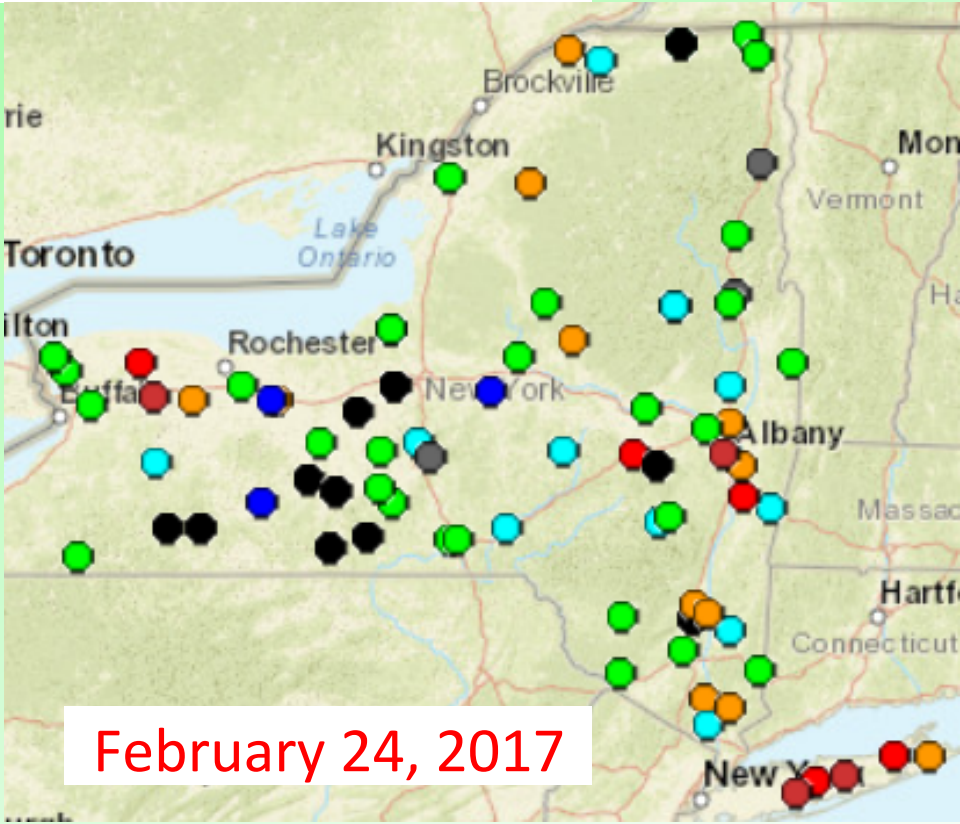
Groundwater Climate Response Network



September 28, 2016



February 24, 2017

Explanation - Percentile classes (symbol color based on most recent measurement)							
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Wells	Springs
Real-Time	
Continuous	
Periodic Measurements	

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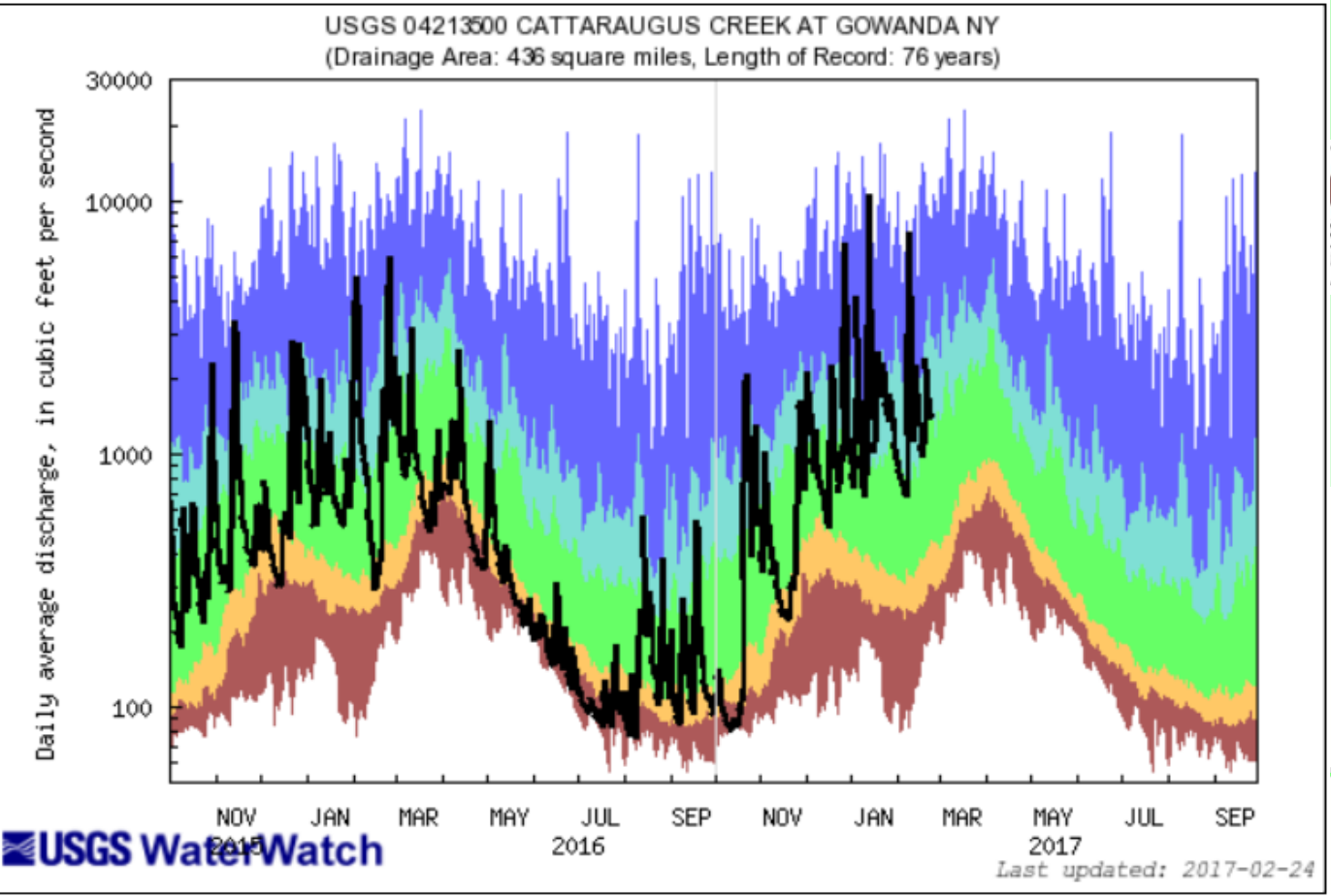
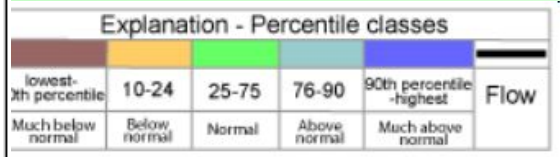
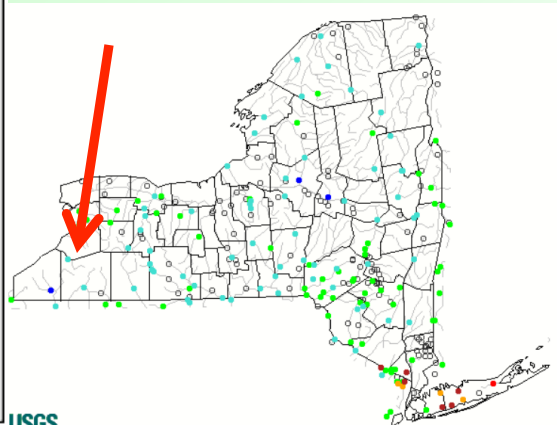
Cattaraugus Creek at Gowanda, NY – 76 years of record

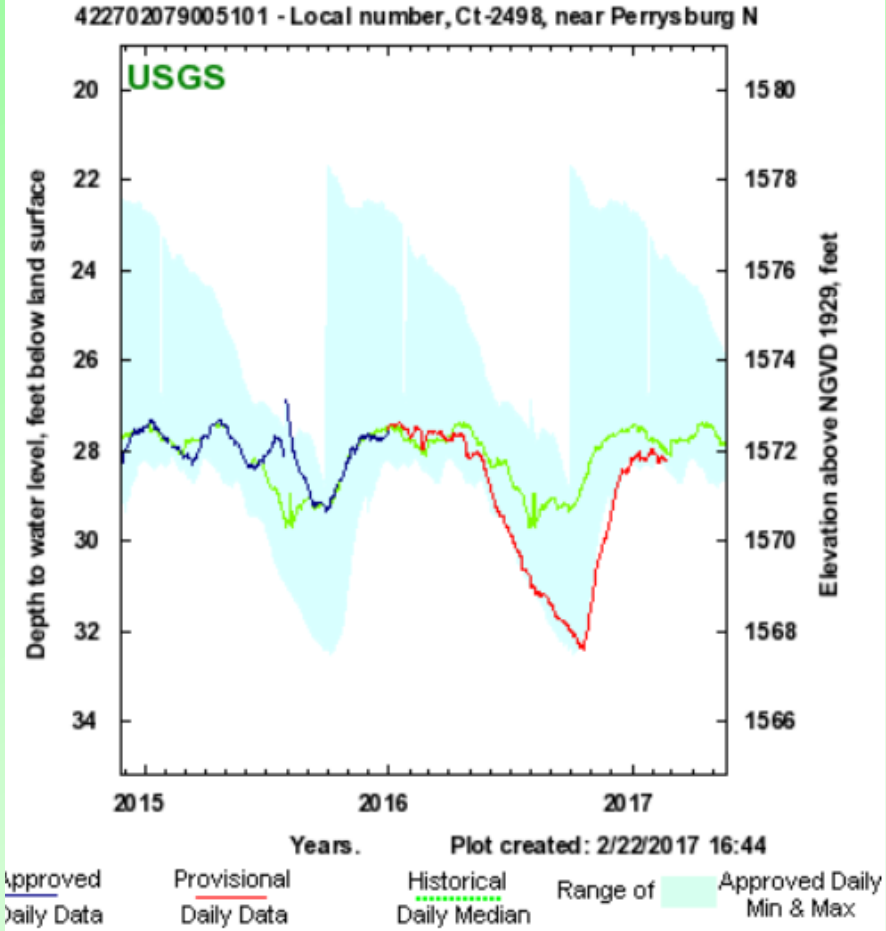






Cattaraugus County, NY

Bedrock aquifer, 8 years



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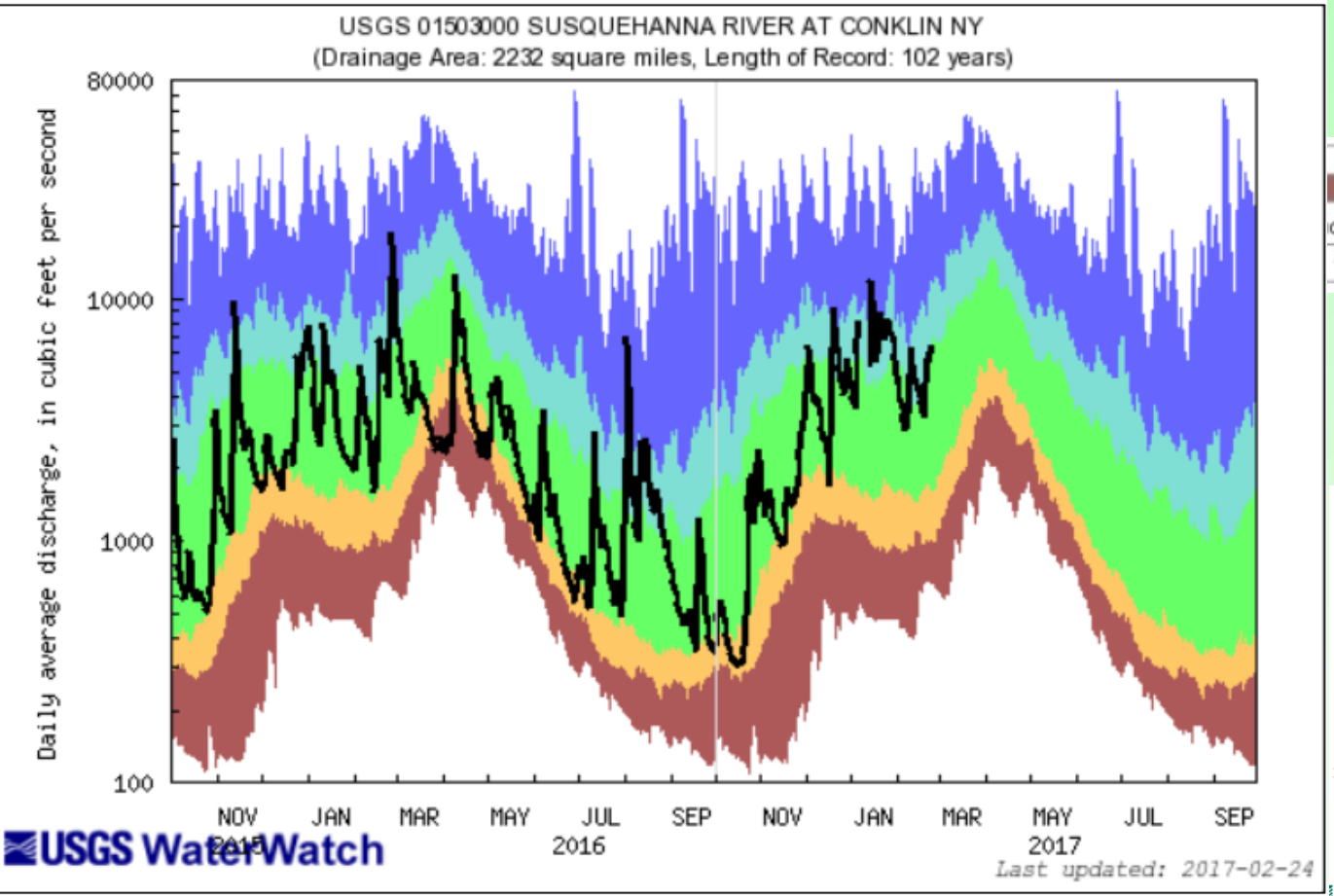
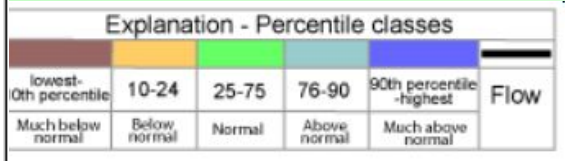
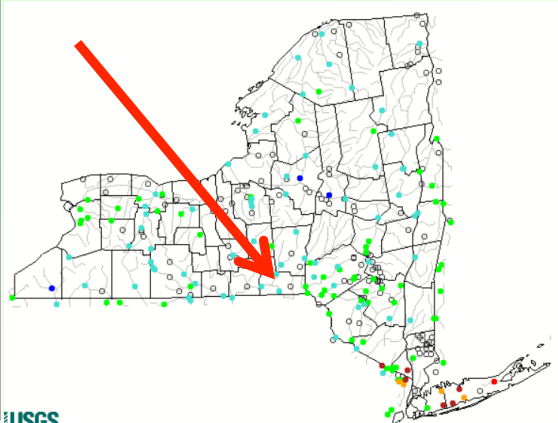
Susquehanna River at Conklin, NY – 102 years of record

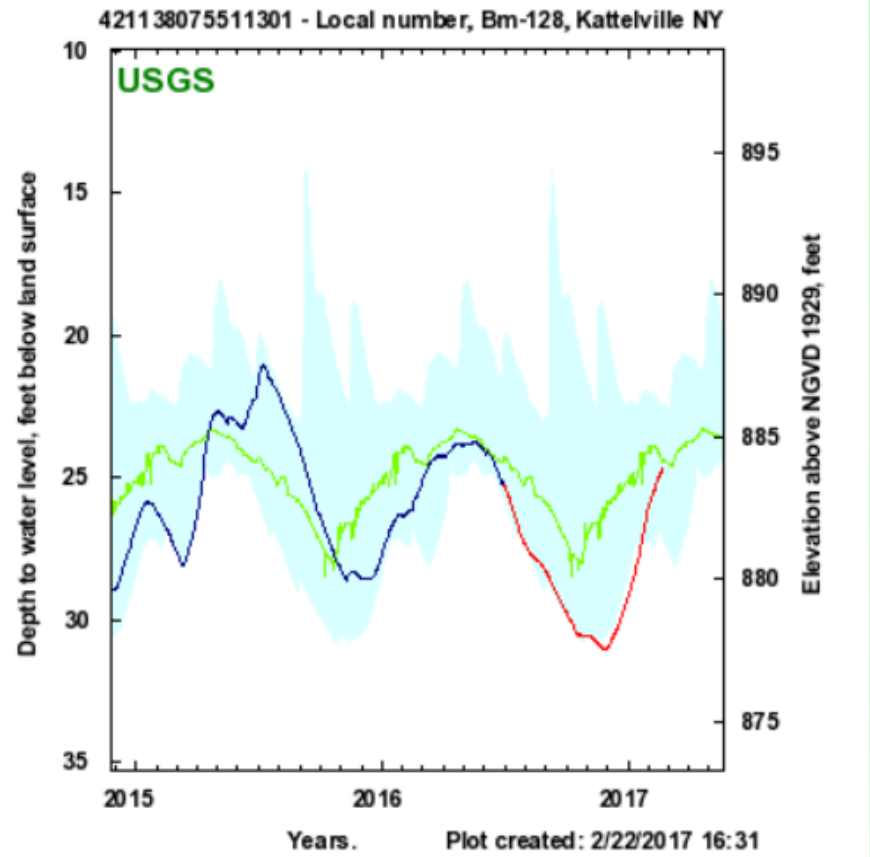




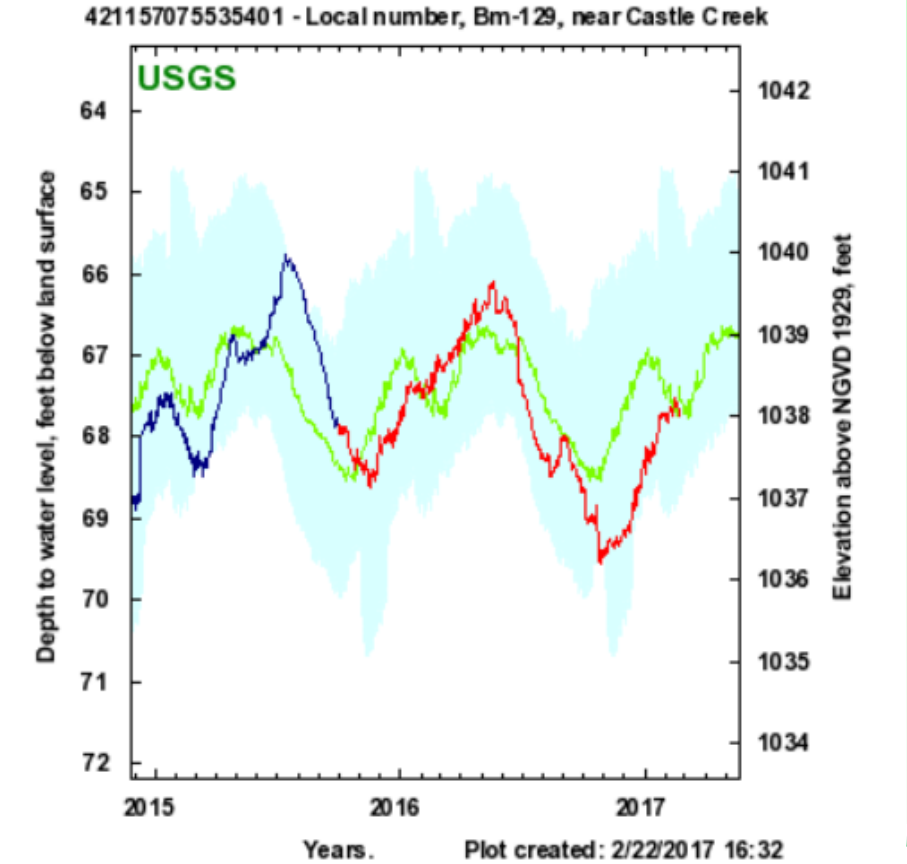


Broome County, NY

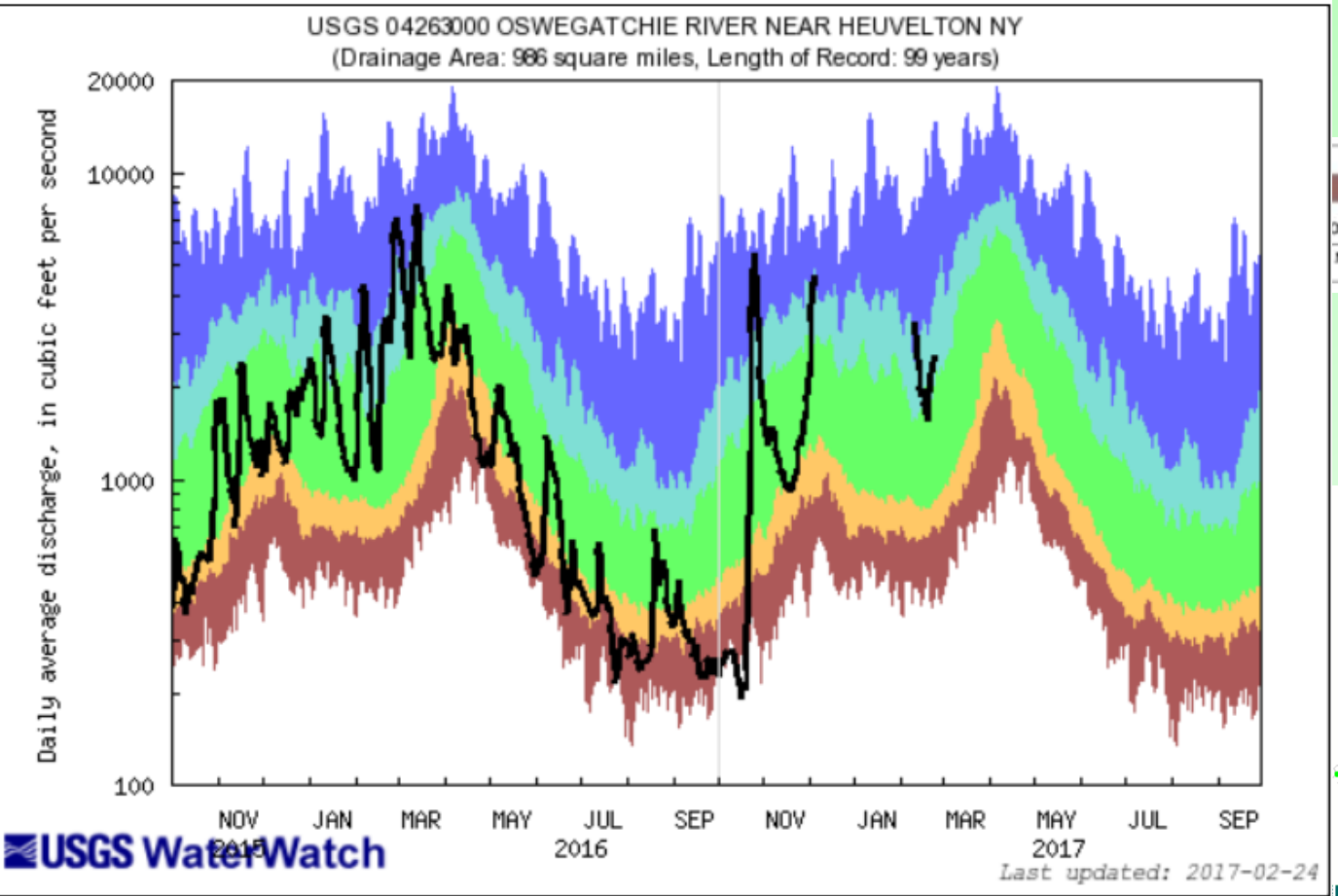
Sand-gravel aquifer, 36 yrs

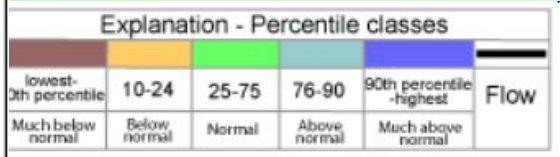


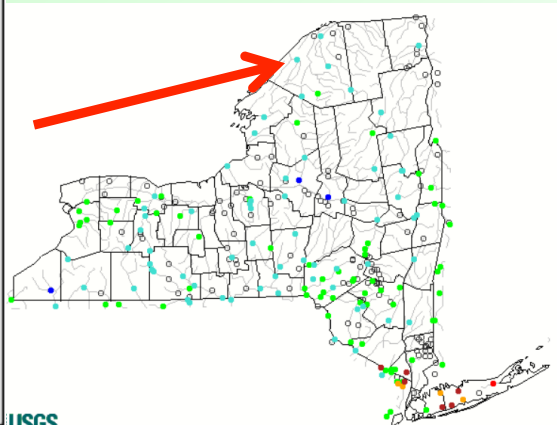
Bedrock aquifer, 31 yrs



Oswegatchie River near Heuvelton – 99 years of record

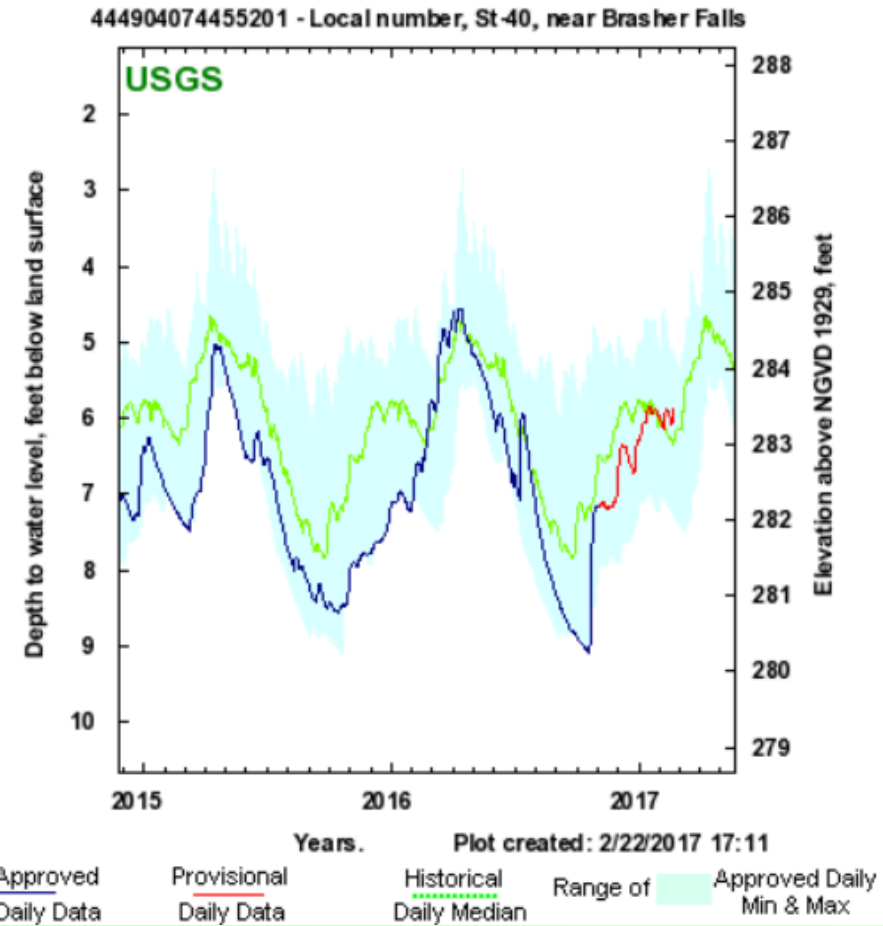




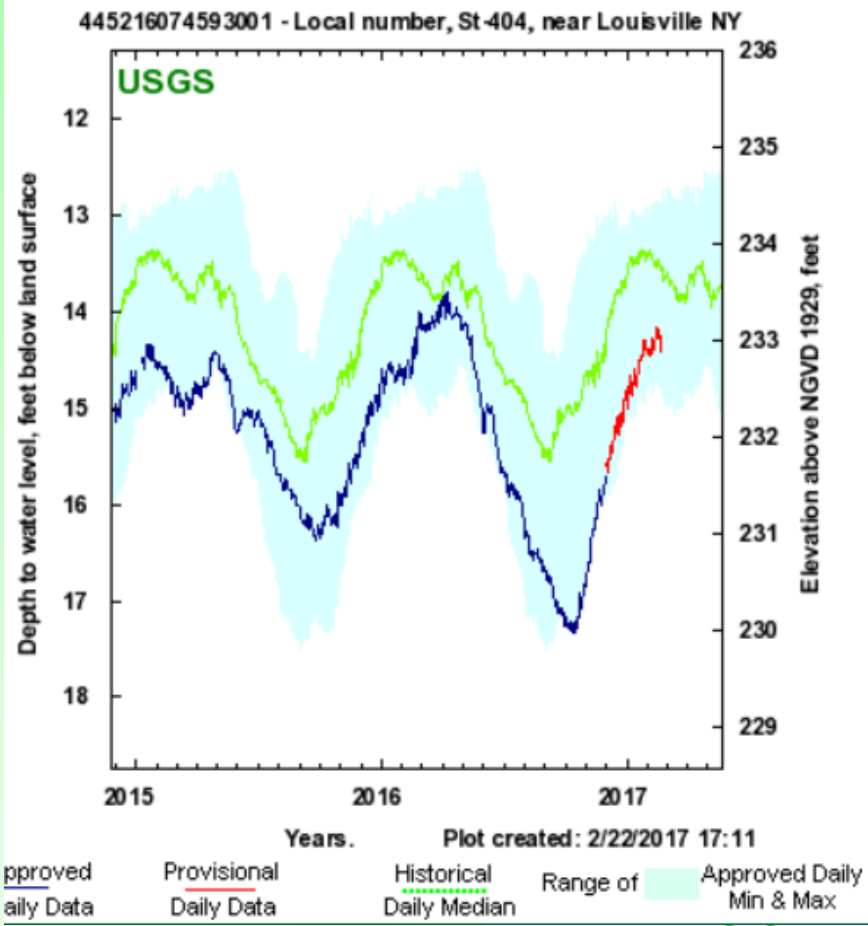


St. Lawrence County, NY

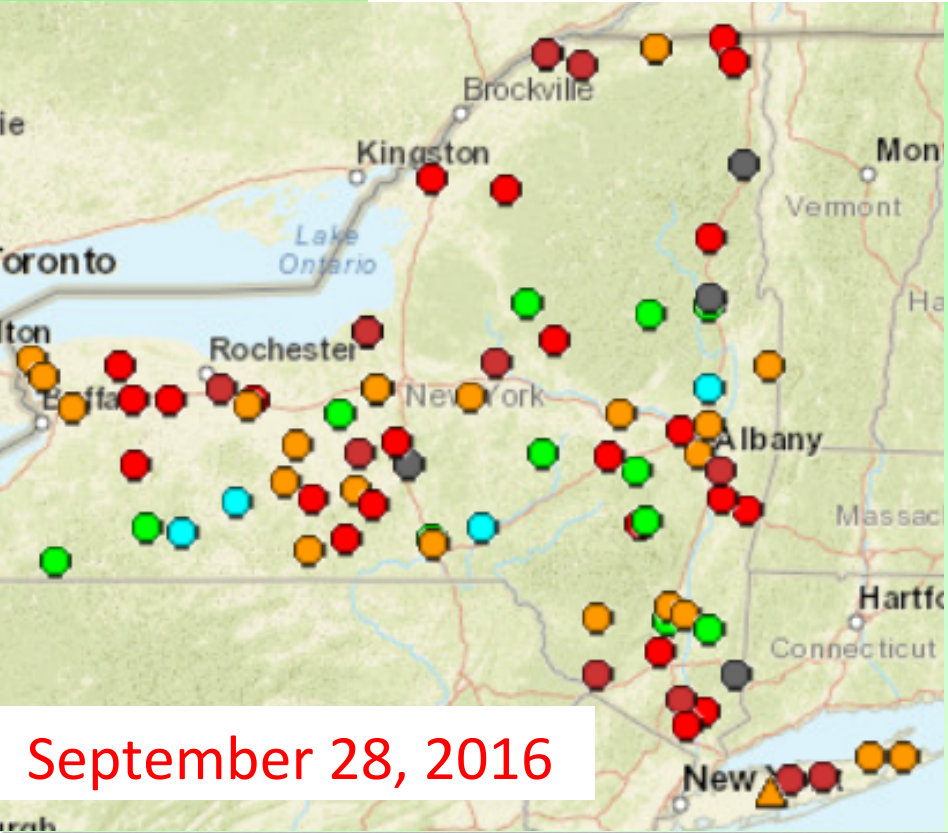
Sand-gravel aquifer, 63 yrs



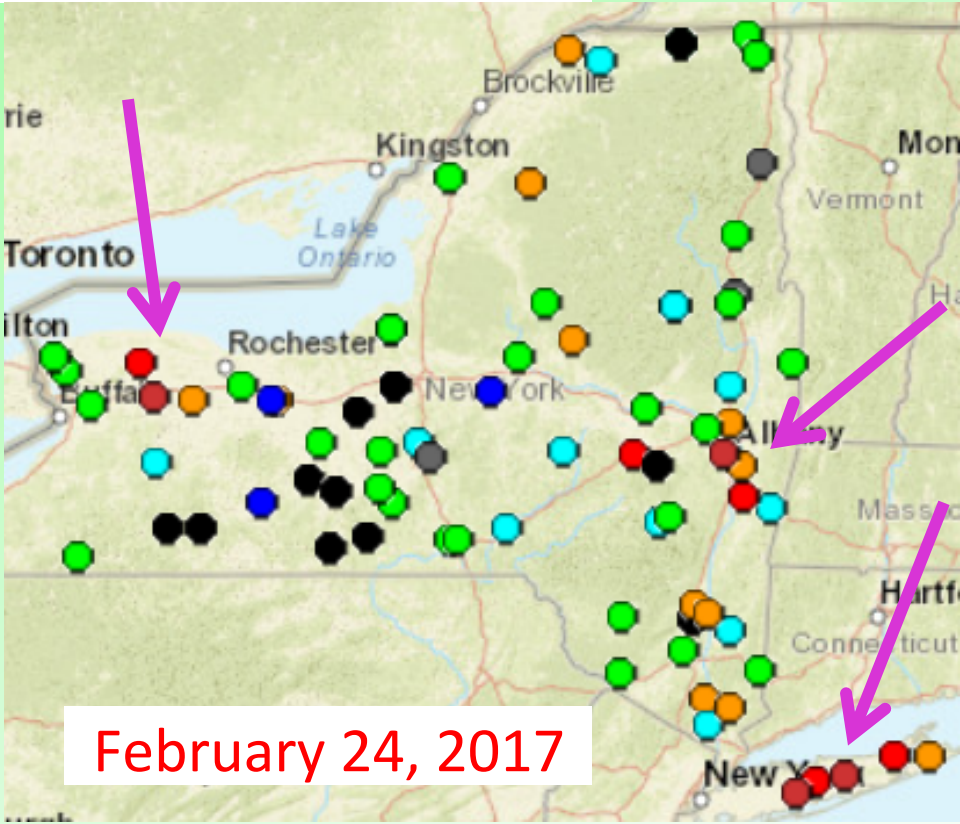
Bedrock aquifer, 12 yrs



Groundwater Climate Response Network



September 28, 2016



February 24, 2017

Explanation - Percentile classes (symbol color based on most recent measurement)							
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Wells	Springs
Real-Time	
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Periodic Measurements	

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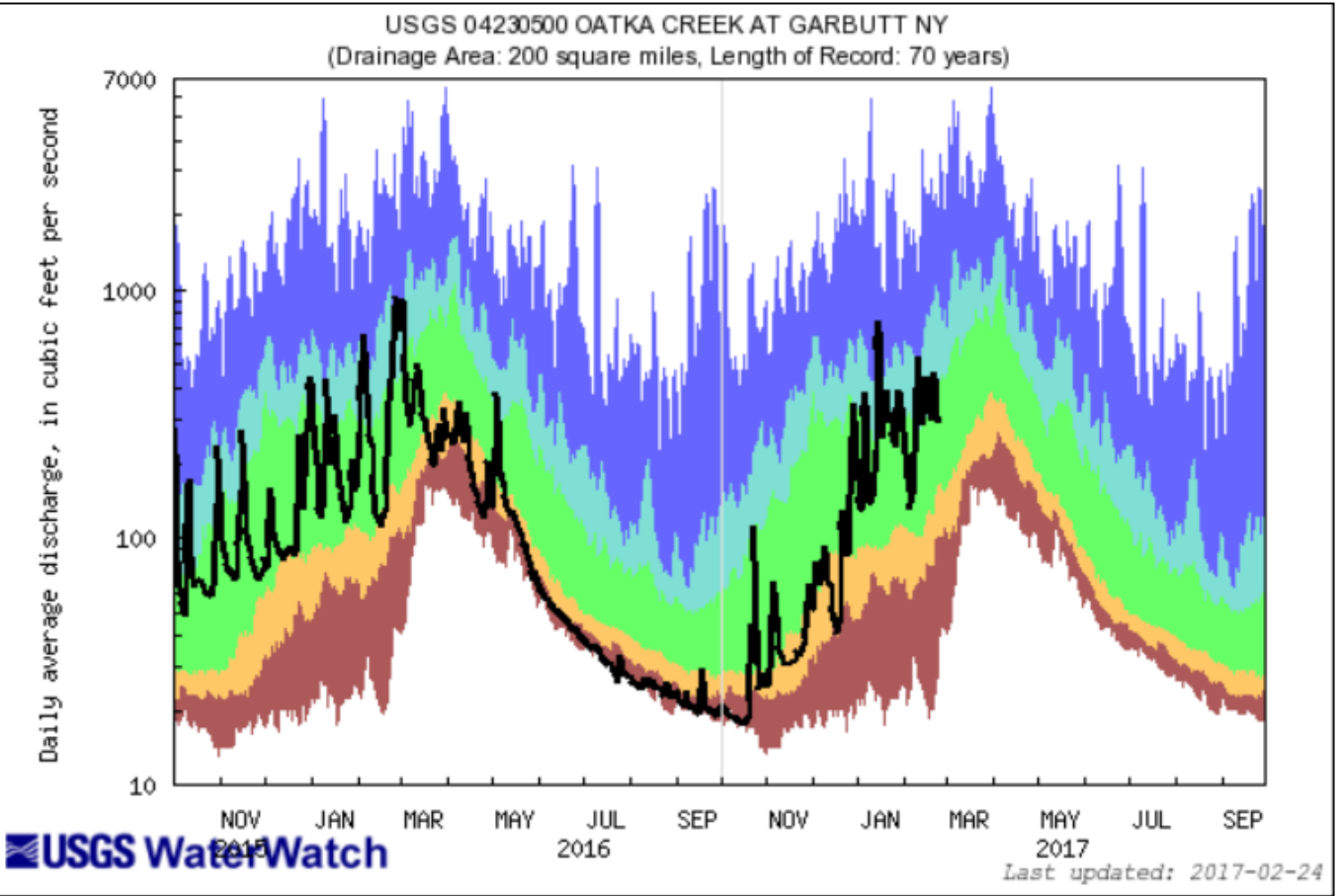
Oatka Creek at Garbutt, NY – 70 years of record



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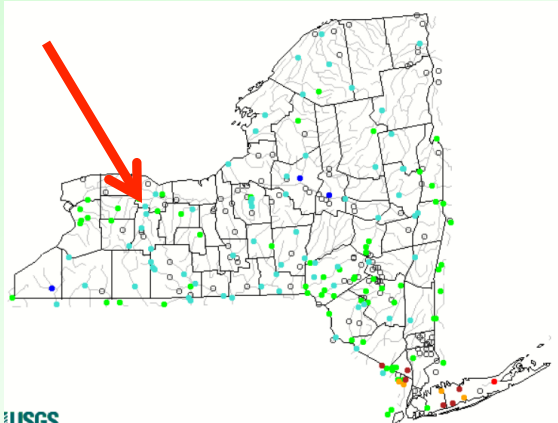
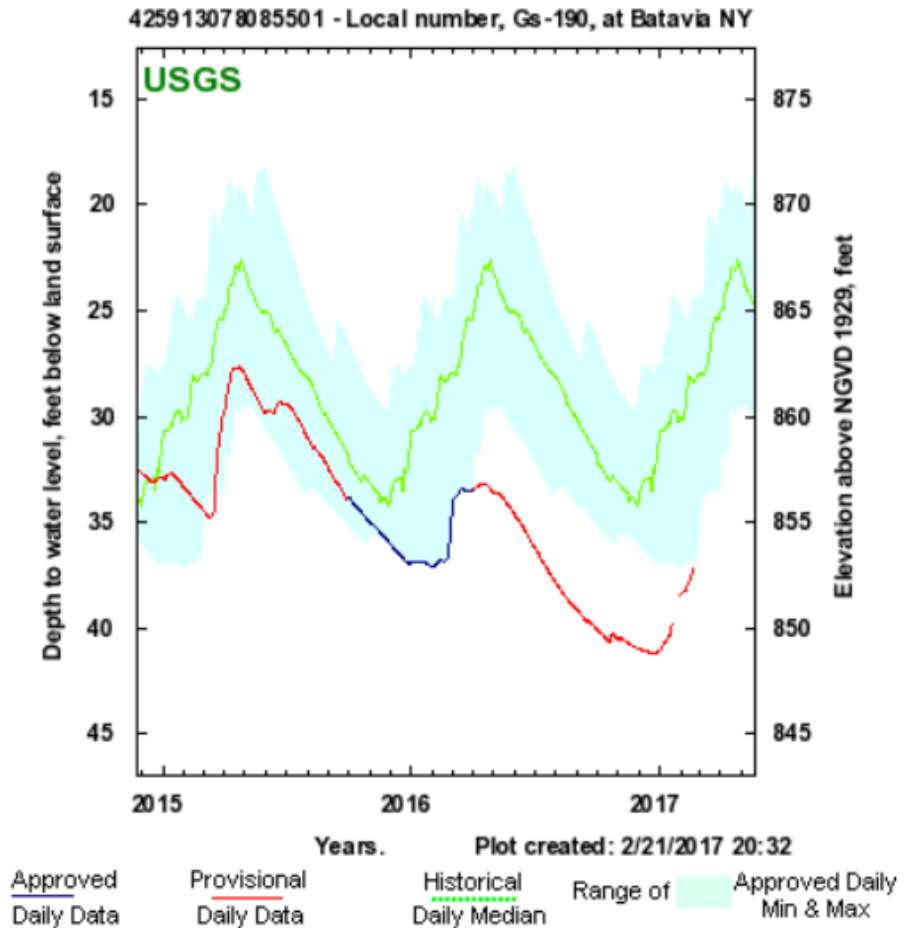
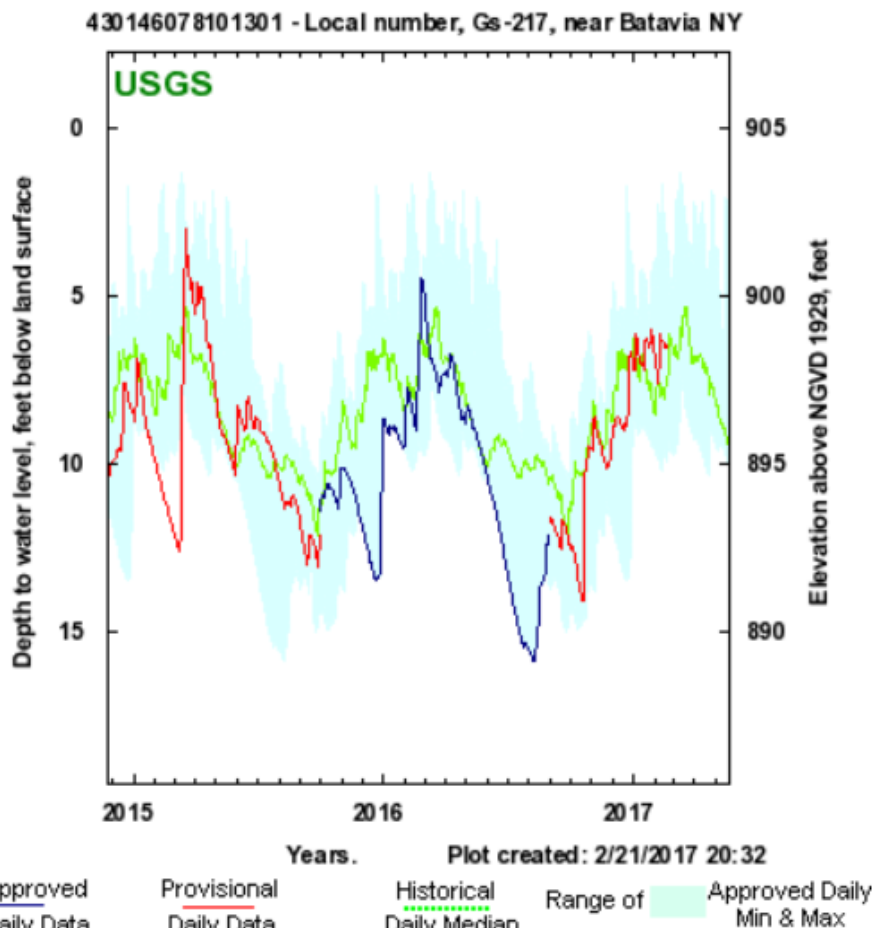


Genesee County, NY

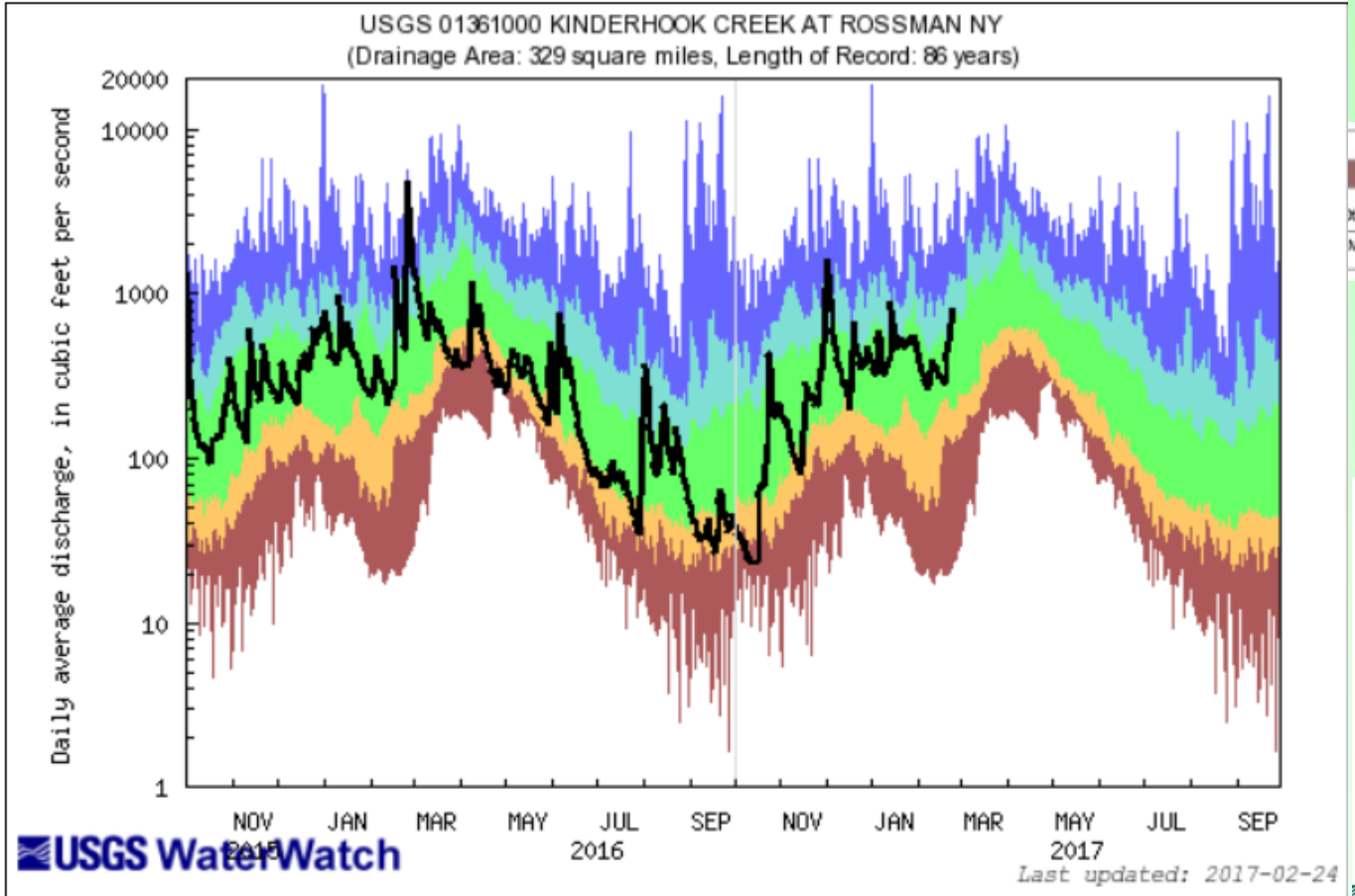
Sand-gravel aquifer, 18 yrs

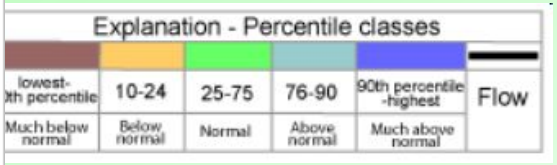


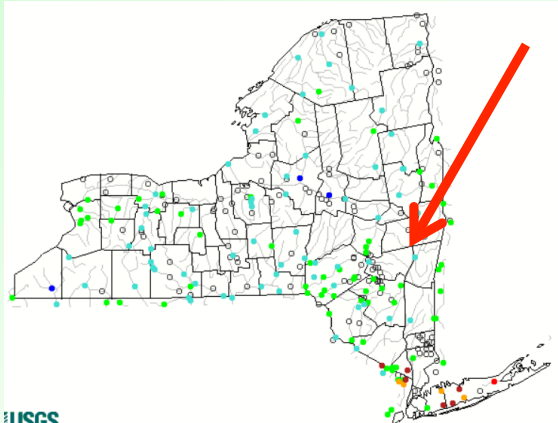
Bedrock aquifer, 18 yrs



Kinderhook Creek at Rossman, NY – 86 years of record

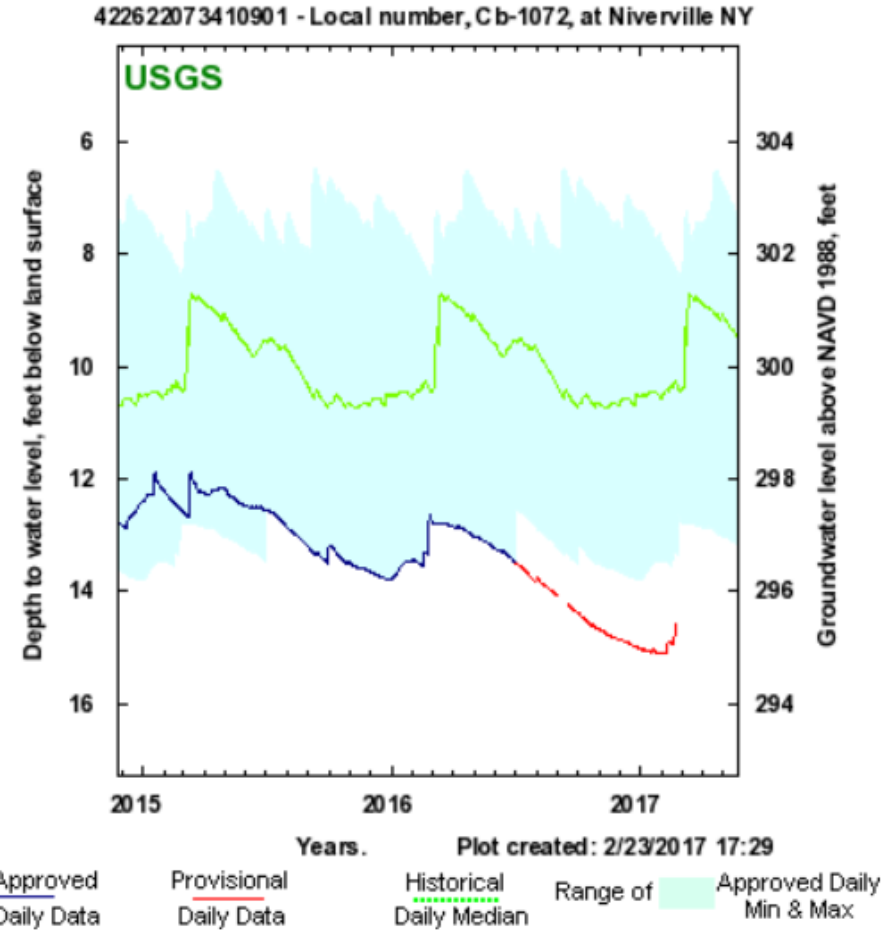




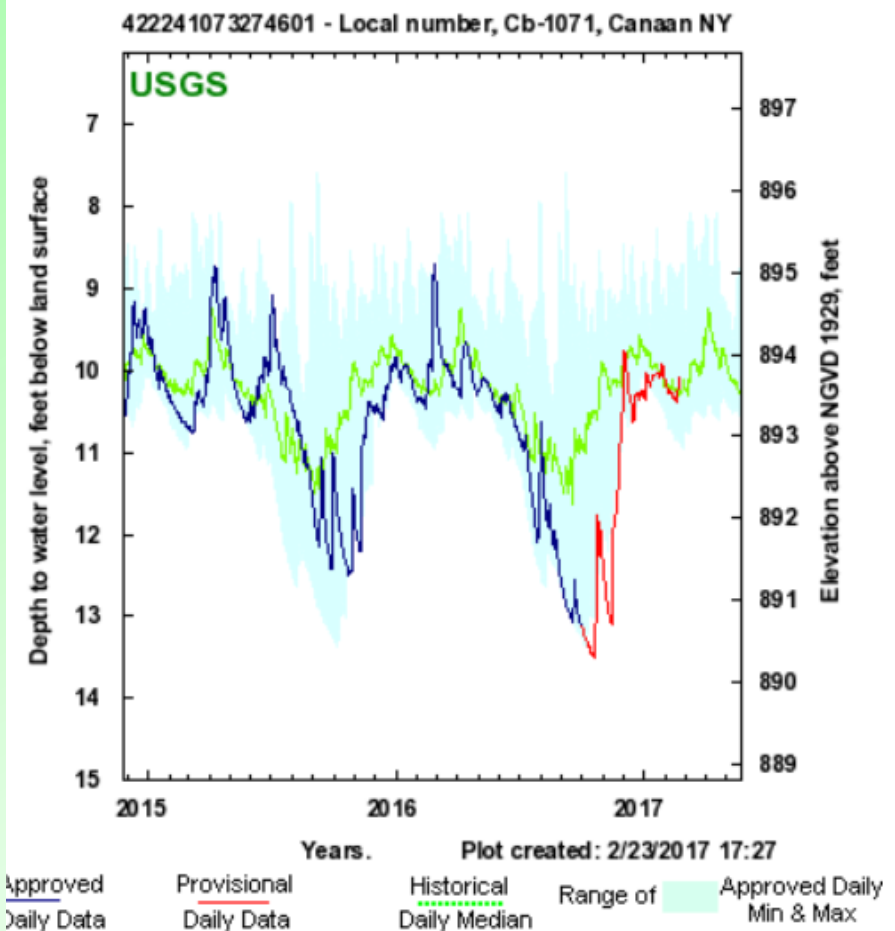


Columbia County, NY

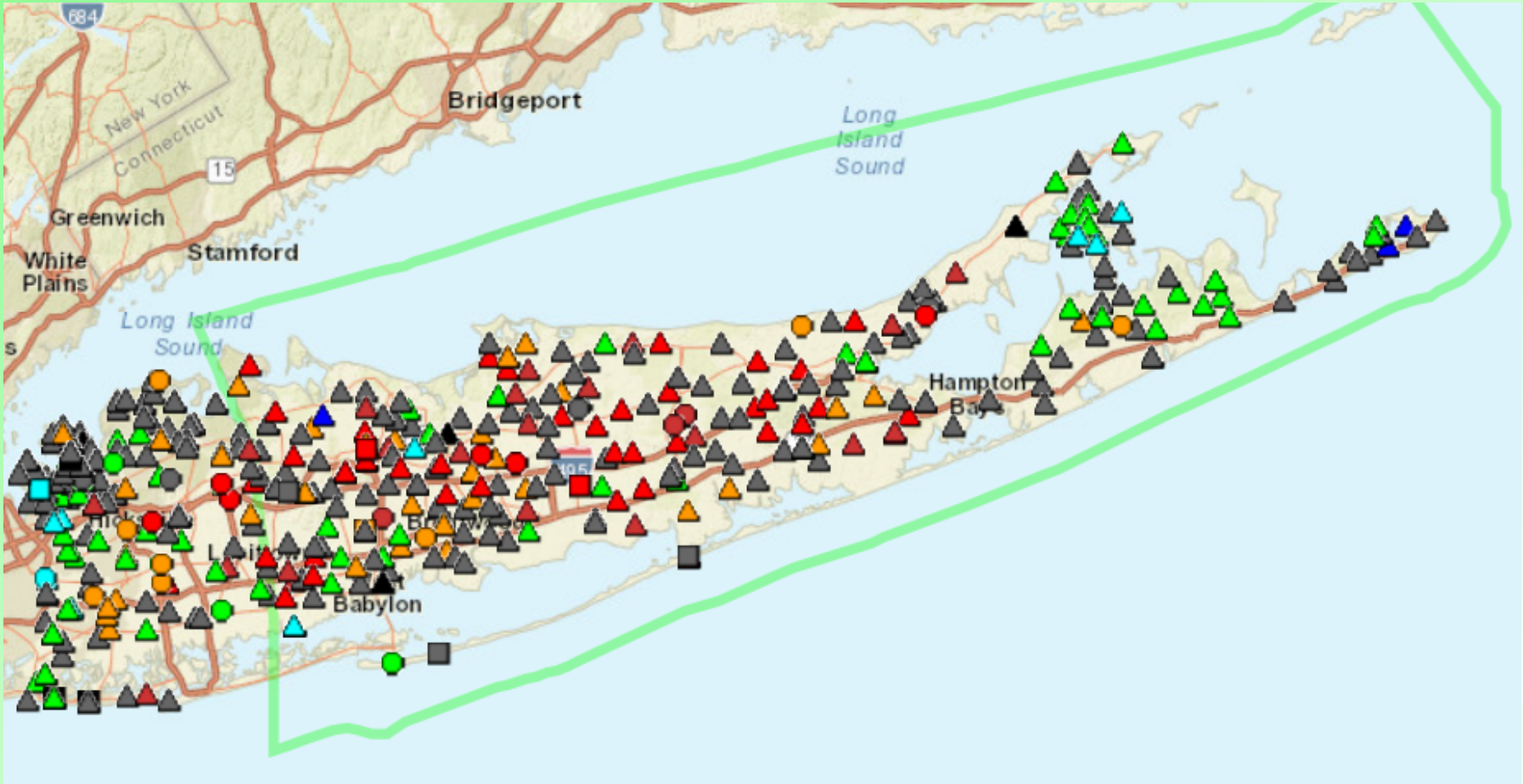
Sand-gravel aquifer, 11 yrs



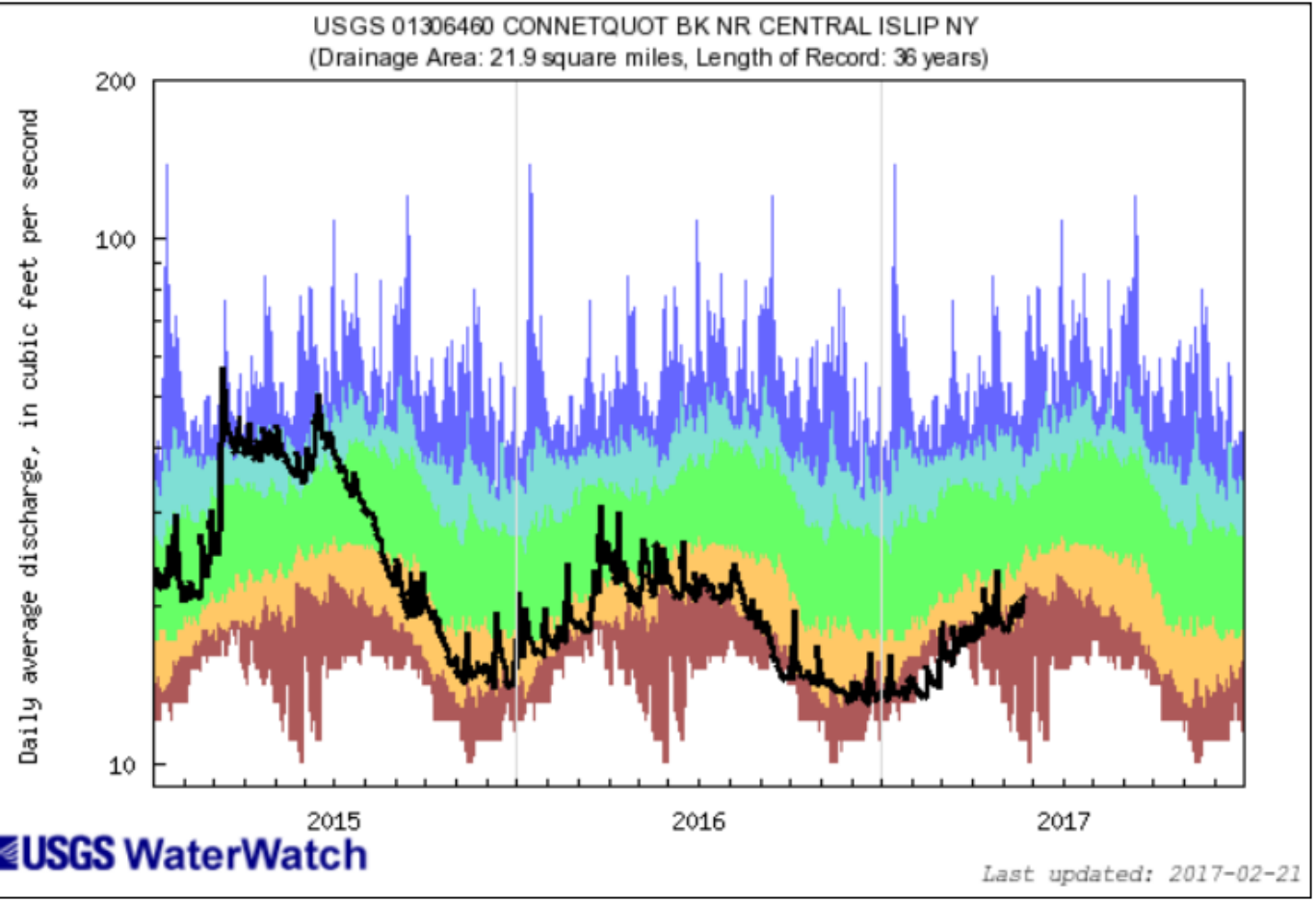
Bedrock aquifer, 12 yrs



Groundwater Conditions, Suffolk County, February 2017



Connetquot Brook near Central Islip, NY – 36 years of record



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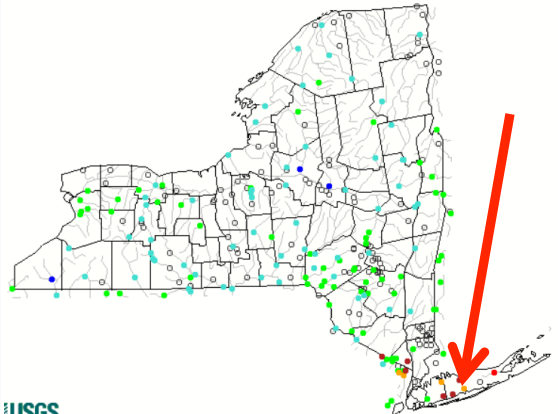
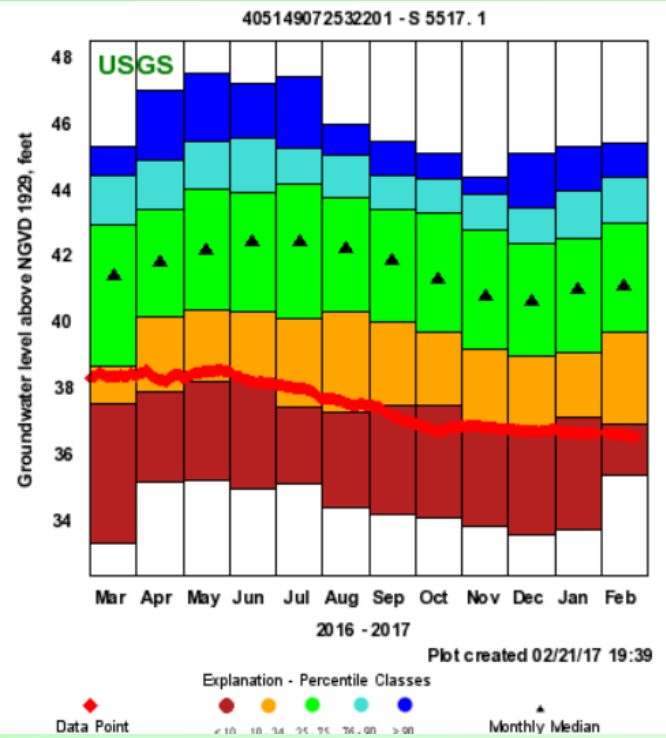
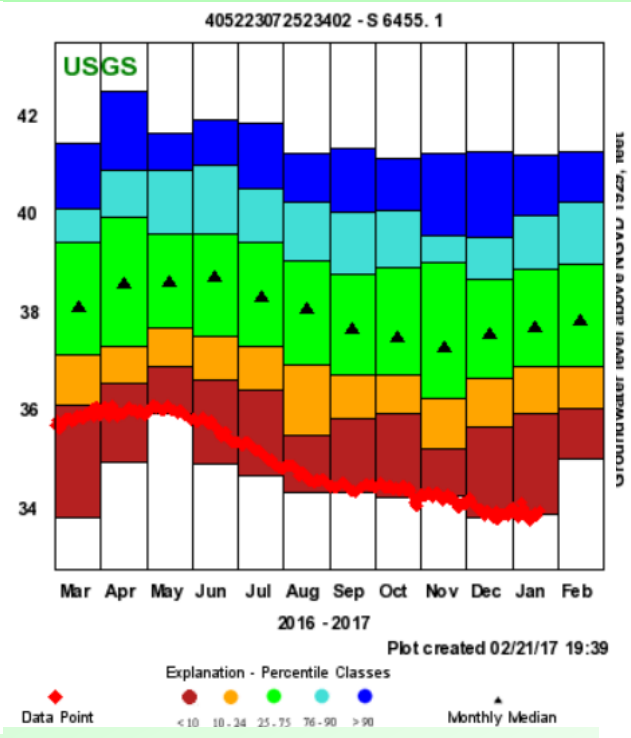
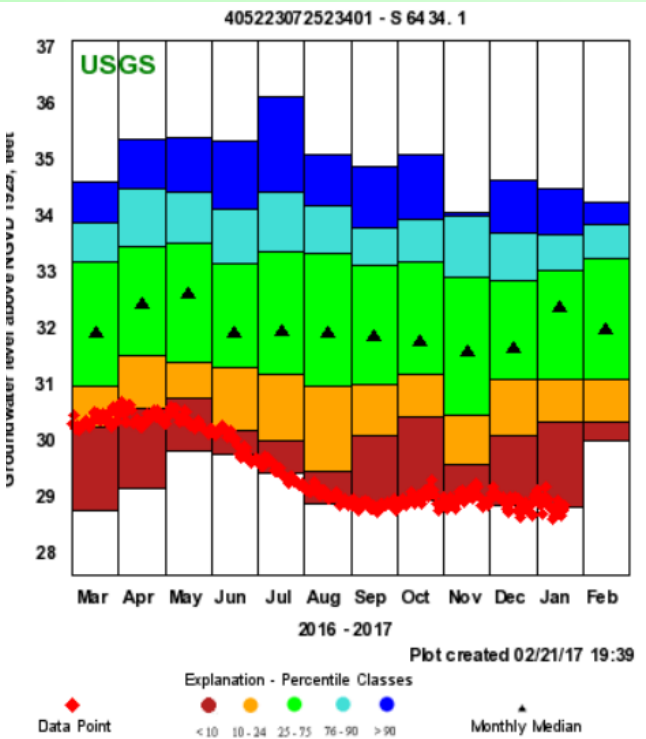


Suffolk County, NY

Depth:	91 ft	962 ft	1395 ft
Aquifer:	Upper Glacial	Magothy	Lloyd
Record:	68 yr	66 yr	66 yr







New York City Reservoirs

http://www.dos.ny.gov/watershed/images/lgmap.jpg

Percent of Capacity

Sept. 28, 2016 – 70.7%

(Normal – 76.0%)

Feb. 23, 2017 – 80.8%

(Normal – 87.6%)

Source: New York City Environmental Protection

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New York Summary

Streamflows are generally in normal or above-normal flow ranges, except for Long Island, where they are below normal.

GW levels are generally in normal or above-normal ranges, however, below-normal water levels can be found scattered across the State and especially on Long Island.

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607-266-0217

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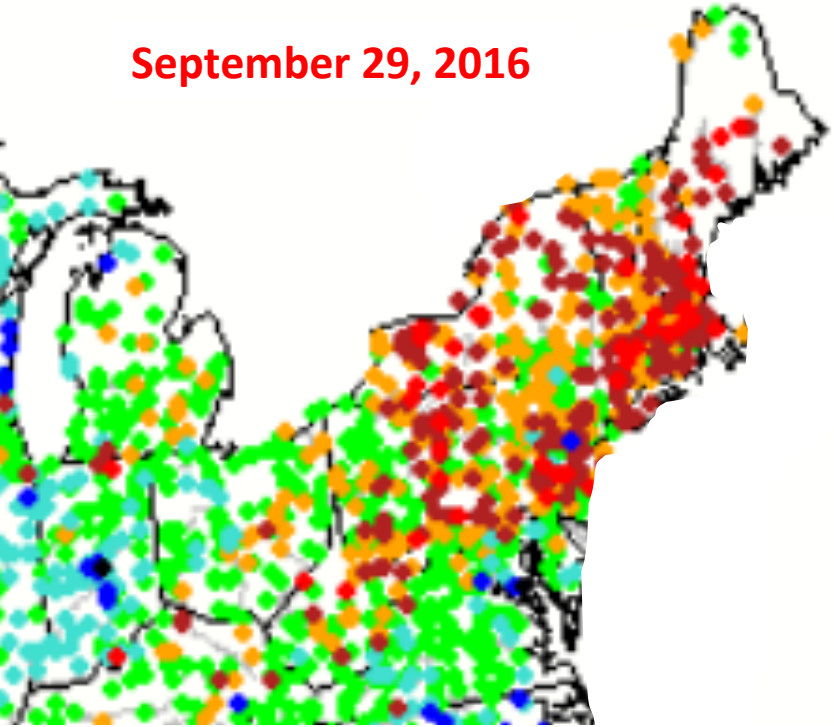
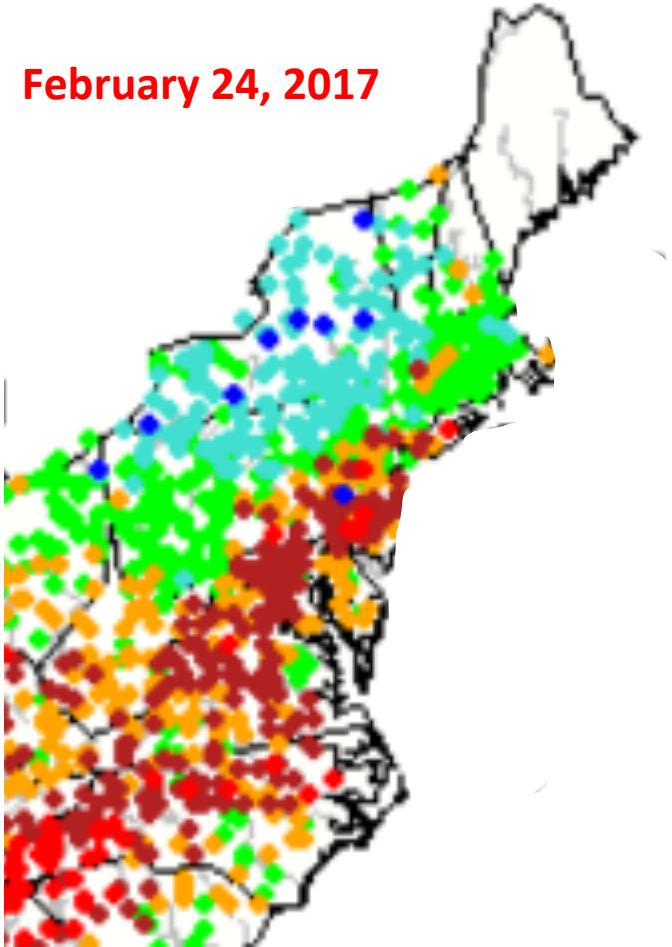
Daily Streamflow – Compared to Historical Streamflow

September 29, 2016



February 24, 2017



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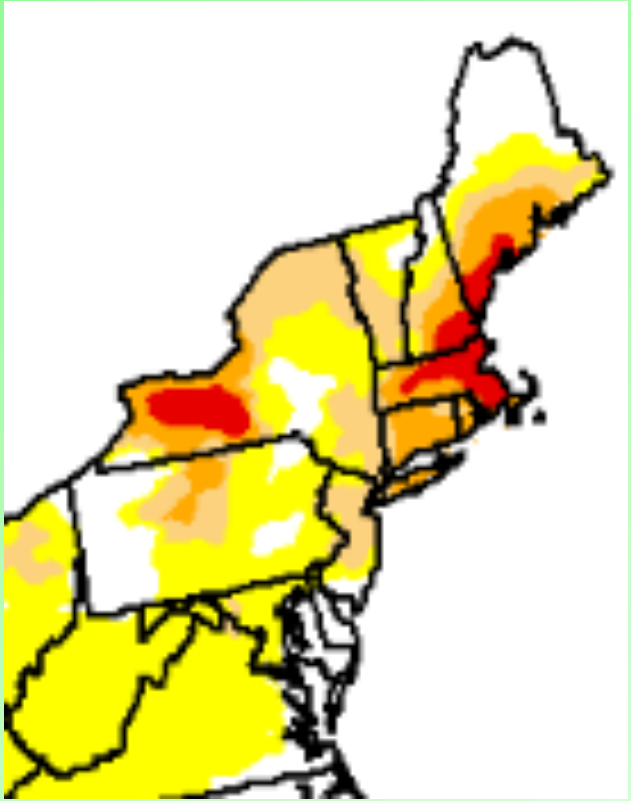
US Drought Monitor



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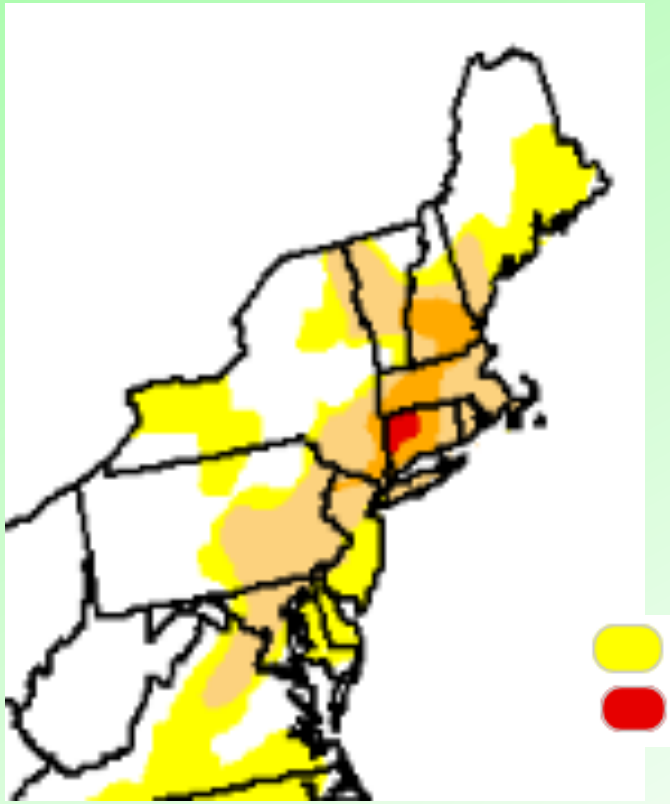

February 24, 2017

D0 (Abnormally Dry)

D3 (Extreme Drought)

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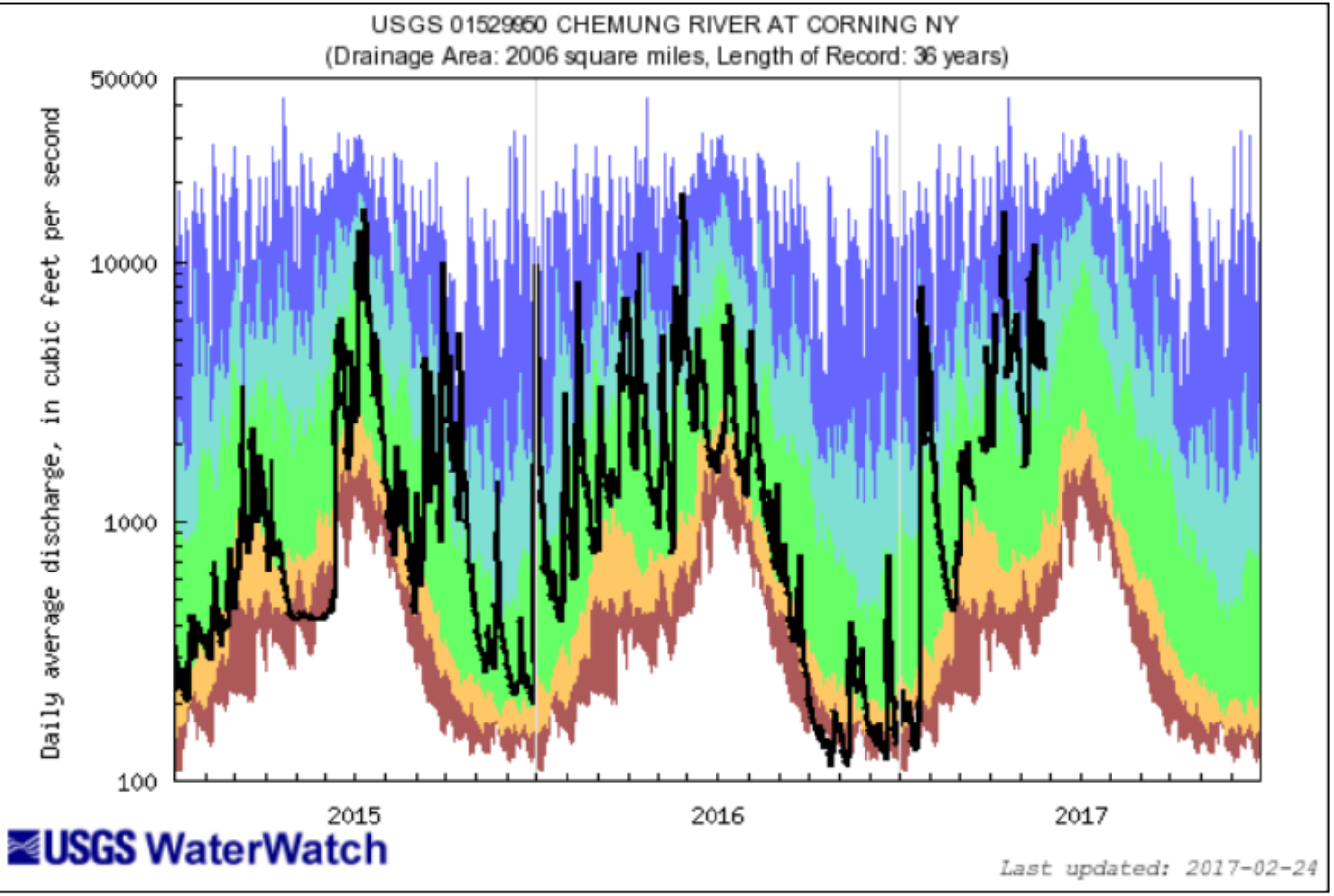
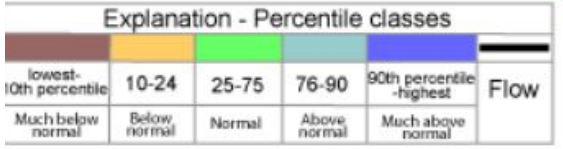
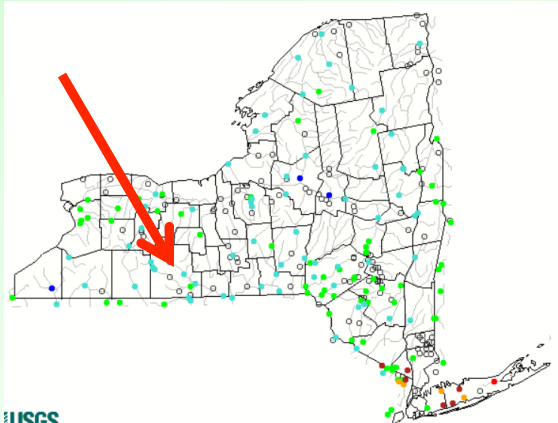
Chemung River at Corning, NY – 36 years of record

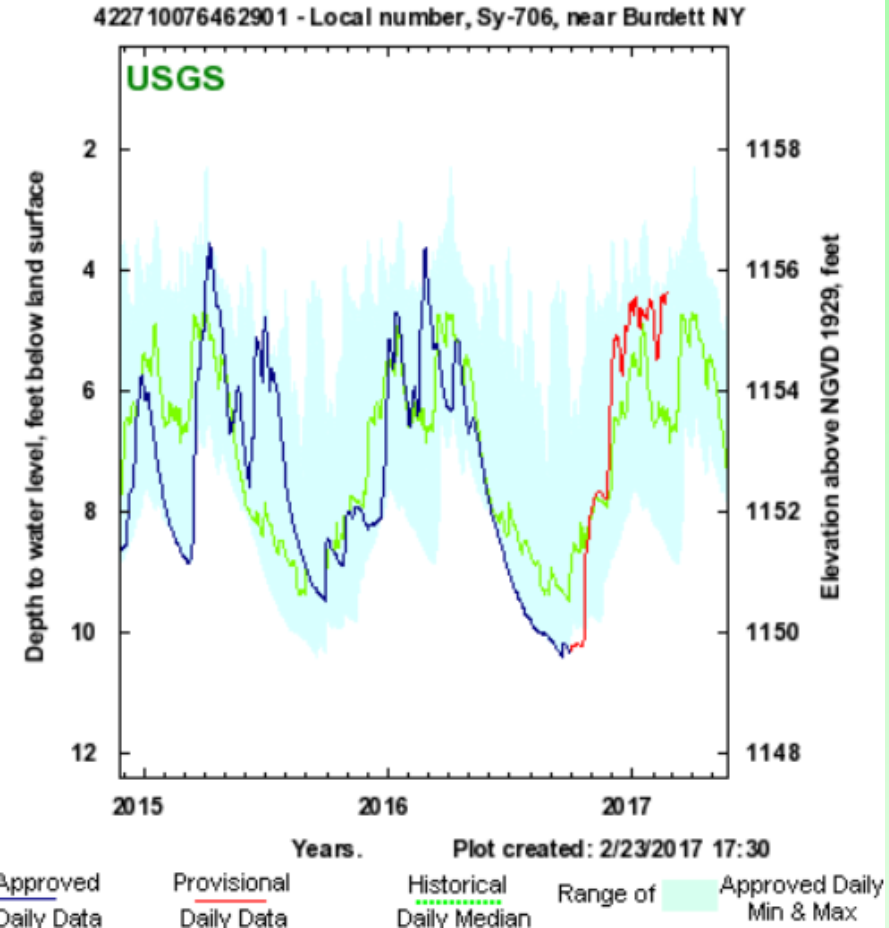




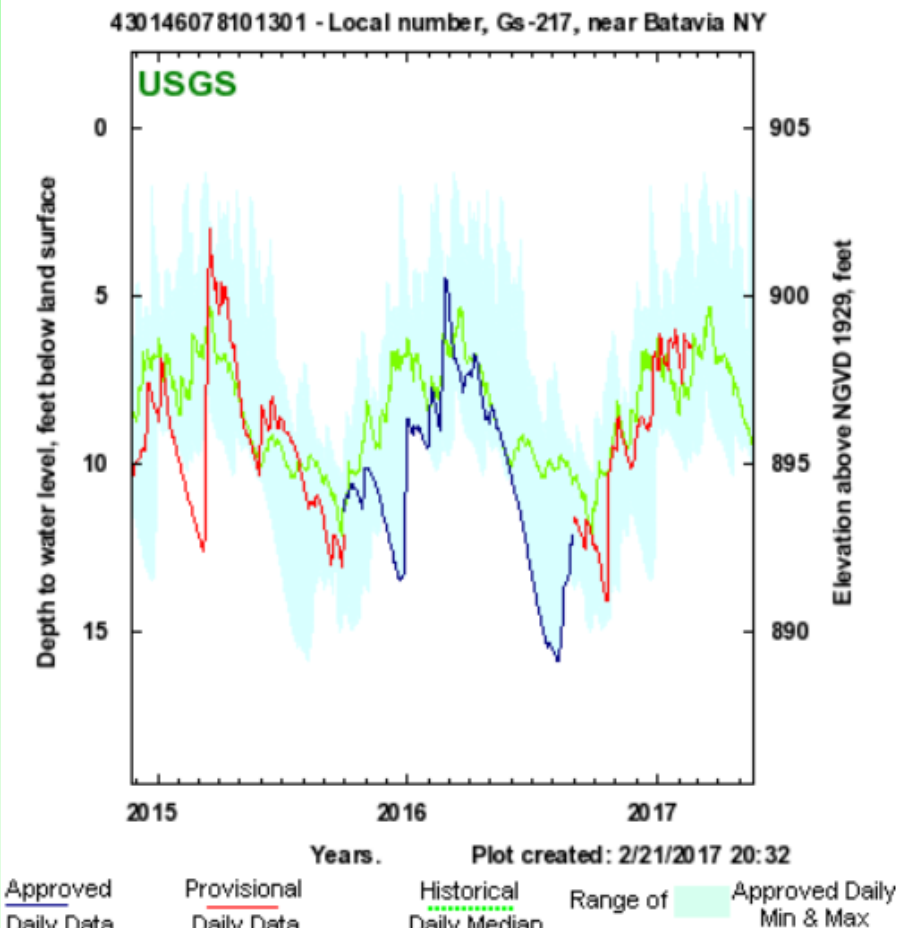


Schuyler and Chemung Counties, NY

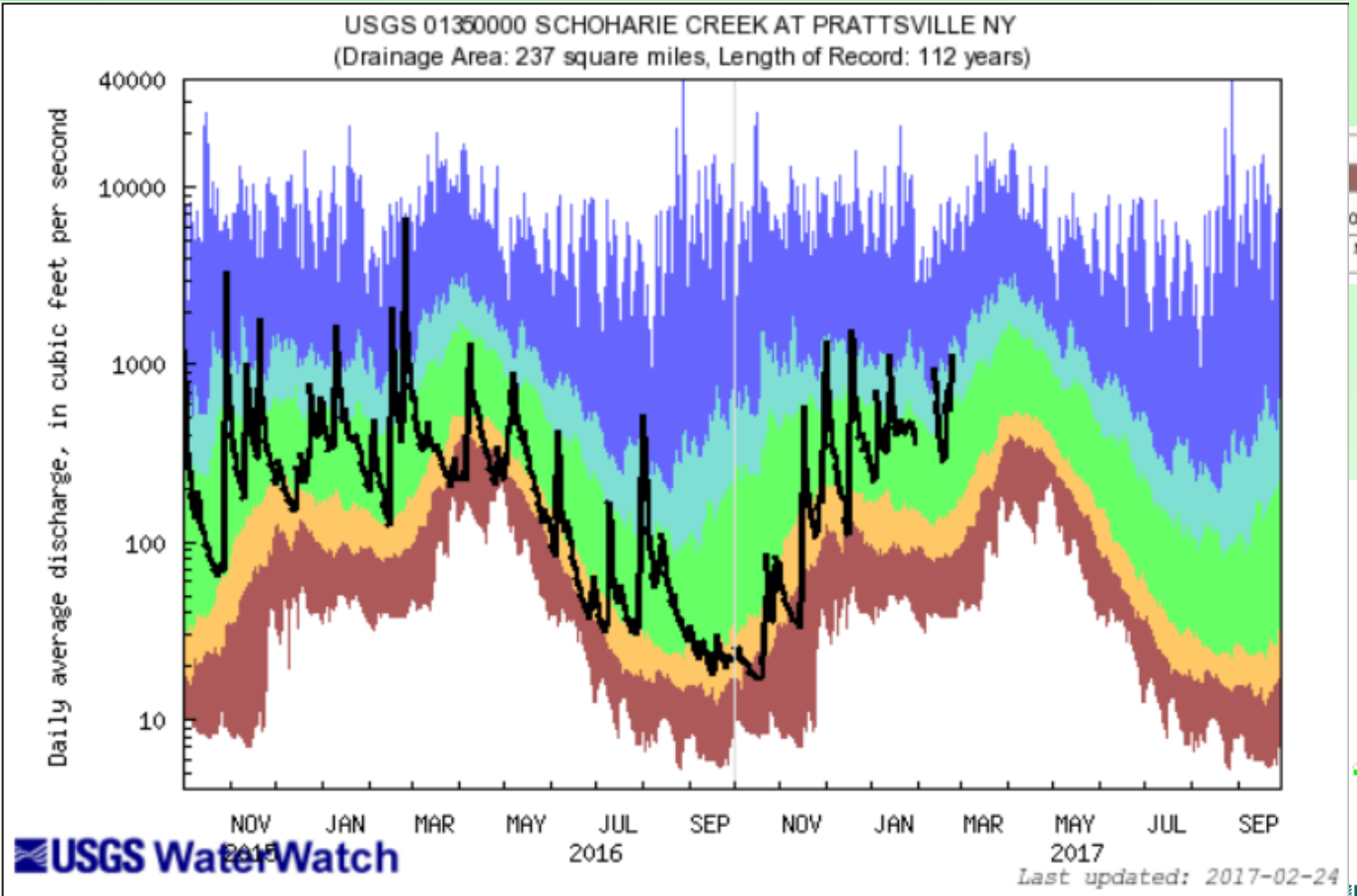
Sand-gravel aquifer, 13 yrs

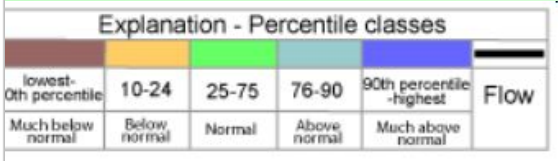


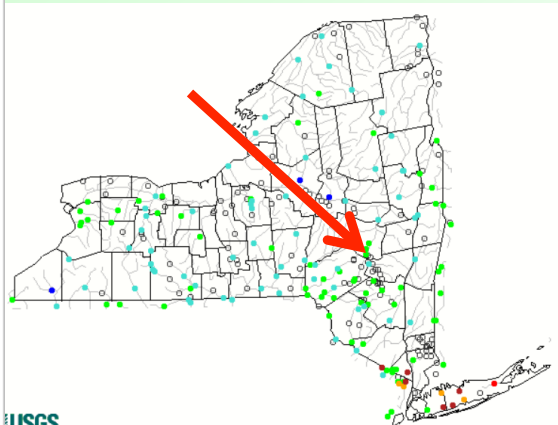
Sand-gravel aquifer, 26 yrs



Schoharie Creek at Prattsville, NY – 112 years of record

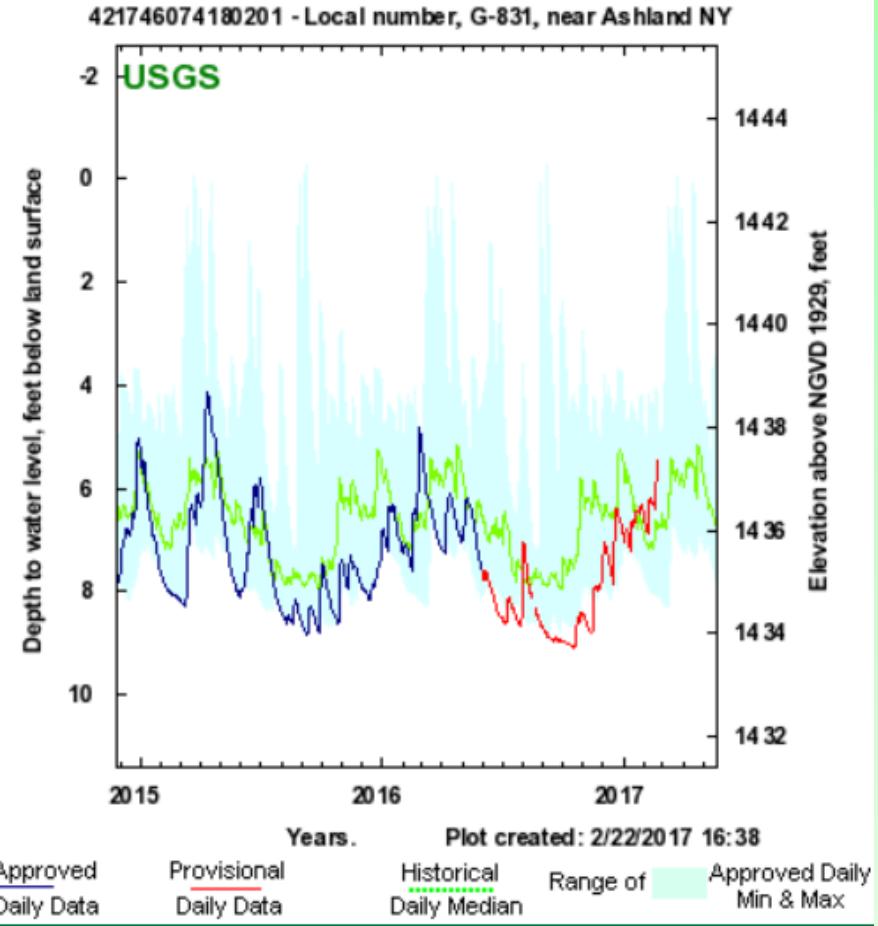




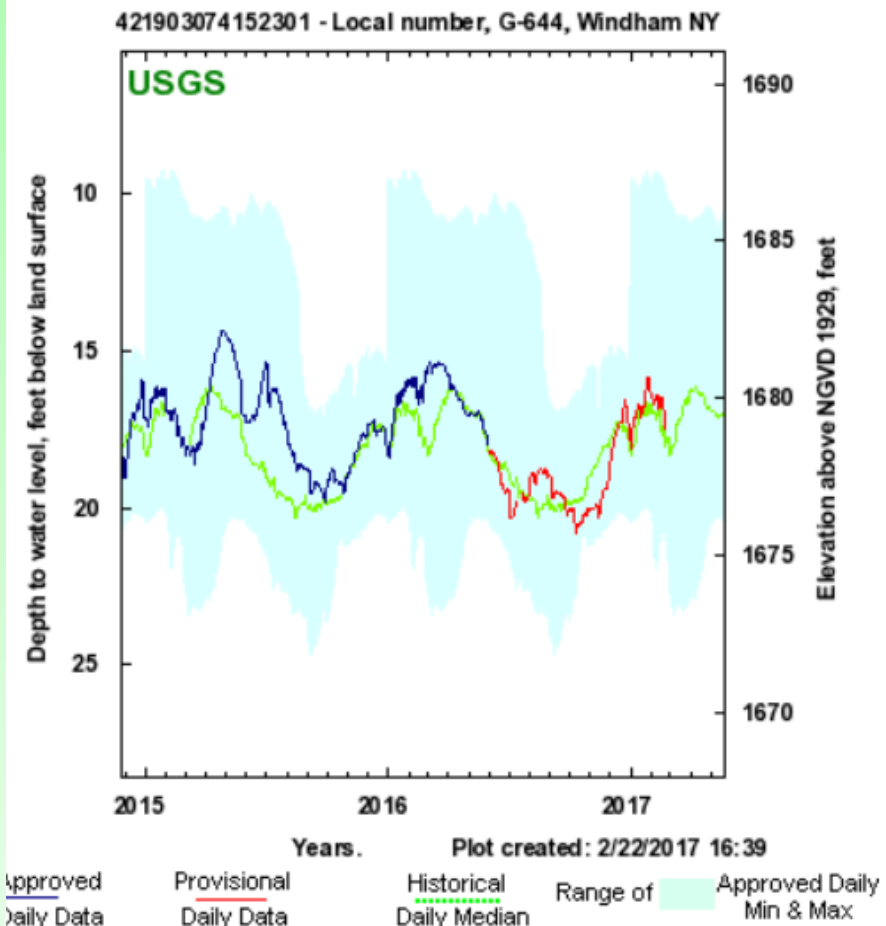


Greene County, NY

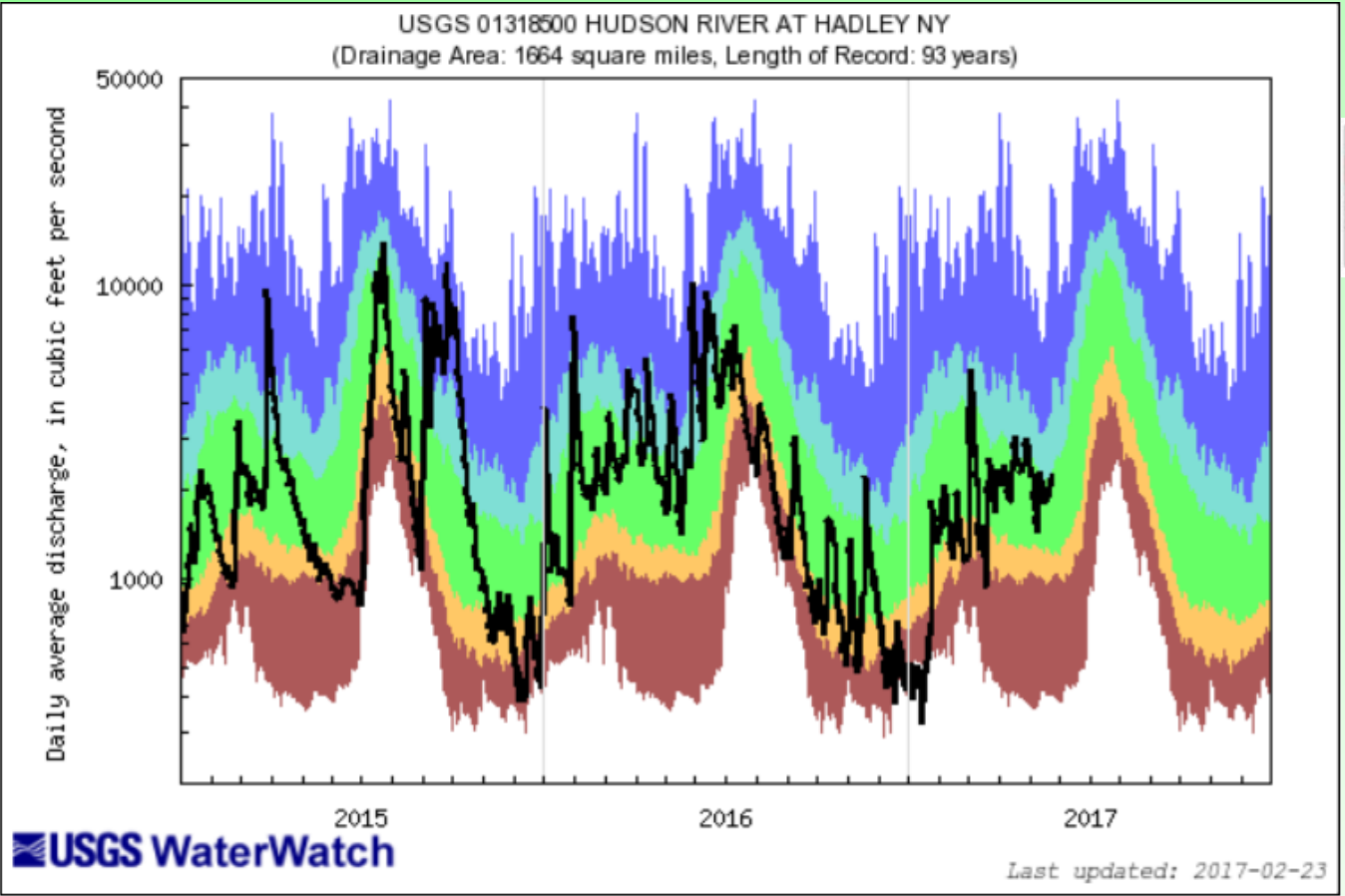
Sand-gravel aquifer, 11 yrs



Bedrock aquifer, 13 yrs



Hudson River at Hadley, NY – 93 years of record



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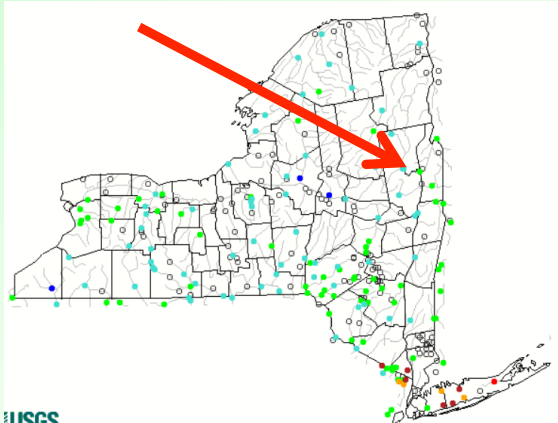
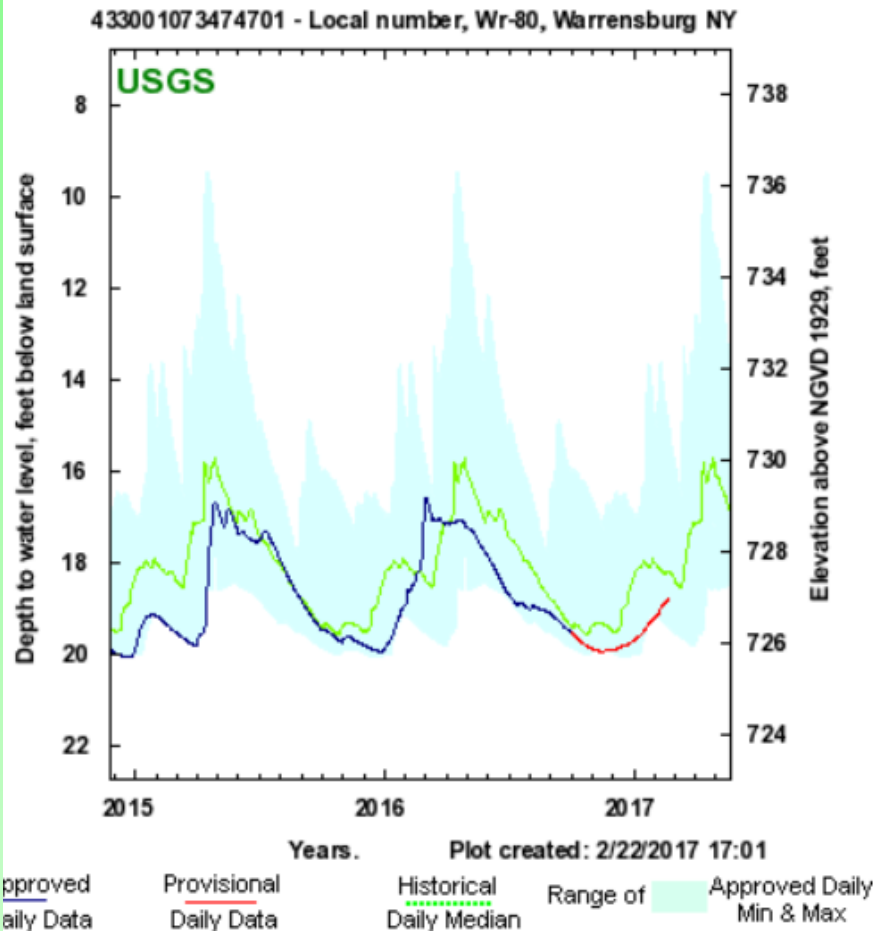
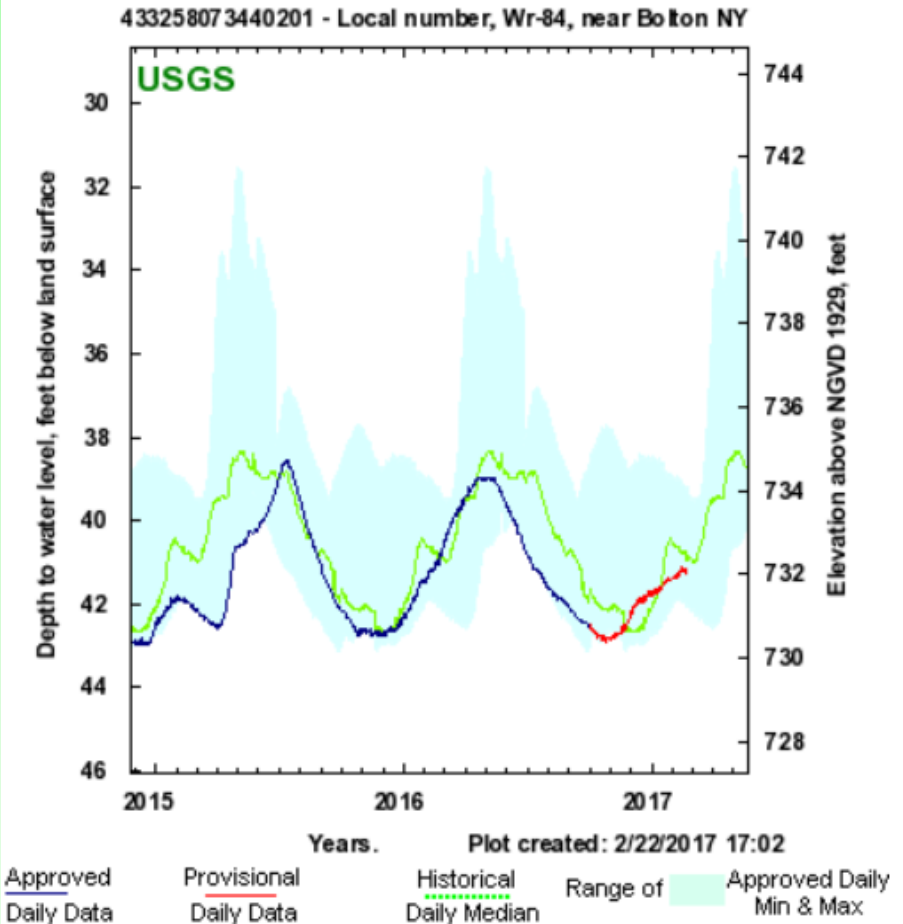


Warren County, NY

Sand-gravel aquifer, 12 yrs



Bedrock aquifer, 9 yrs



Groundwater Climate Response Network

Includes wells:

- Located in aquifers that respond to climatic fluctuations
- Minimally affected by pumpage
- Essentially unaffected by sources of artificial recharge (from irrigation, canals, etc.)
- Have never gone dry or are not susceptible to going dry

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Groundwater Climate Response Network

Response to rainfall depends on:

- Type of aquifer – sand-gravel, bedrock
- Depth to water table – increases with ET and lack of rain
- Density of fractures to convey water in bedrock

Apparent response depends on:

- Length of period of record
- Does well record extend back to 1960s drought?

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Hydrologic Response to Predicted Rainfall

Low-intensity, long-duration rainfall

- Low amounts of runoff
- Rain will soak into dry ground
- Infiltrated water will wet soil particles before reaching water table
- ET will continue until leaf-off

Effects on Streamflow – Probably negligible

Groundwater levels – Likely increase, but dependent on aquifer characteristics

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Hydrologic Response to Predicted Rainfall

High-intensity, short-duration rainfall

- Larger percentage of rain will run off
- Less infiltration

Effect on Streamflow

- Flash flood potential in small steep basins & urban areas.
- Large streams may rise but unlikely to flood.

Effect on Groundwater levels

- Small, if any, increase; dependent on aquifer characteristics
- ET will continue until leaf-off

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Hydrologic Response to Predicted Rainfall

Best Scenario to End Drought

Medium-intensity, long-duration rainfall

- Some run off
- Large amount of infiltration

Effect on Streamflow

- Flows will increase; flooding is unlikely.

Effect on Groundwater levels

- Gradual increase

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