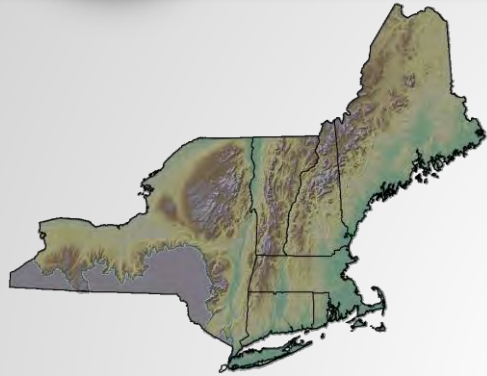




Northeast River Forecast Center's

March 28 2019 Spring Outlook



Brought to you by:

Edward Capone – Service Coordination Hydrologist

Overview to Include:

- Spring Outlook**
- Precipitation**
Past...Current....Future
- Current/Future...Streamflow**
 - Groundwater
 - Soil Moisture
 - Lake Levels
 - Snowpack
- Short/Medium Range Models**
- Seasonal Outlook**



Building a Weather-Ready Nation



Main Features

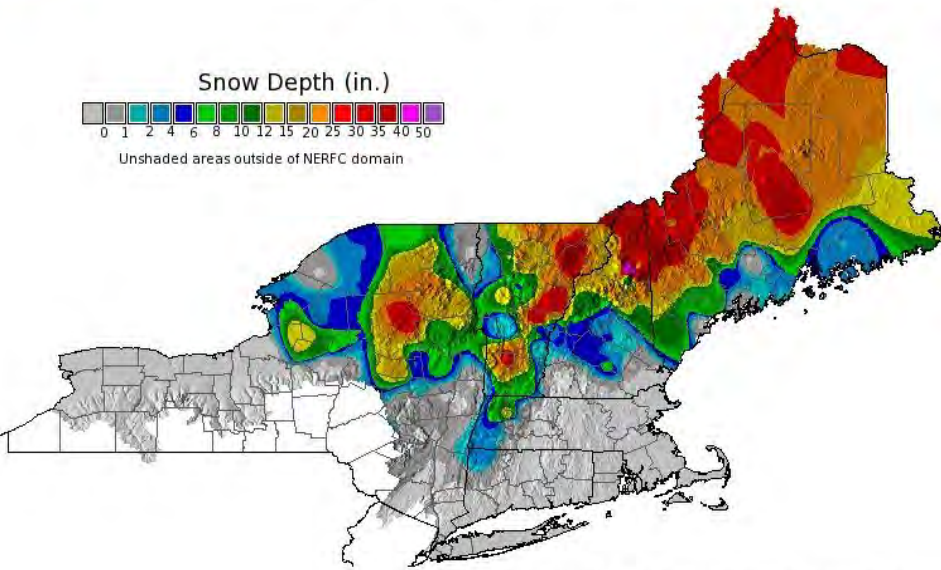


Significant Winter across the North

- ❑ After many consecutive wet months....the last 30 days precipitation below normal
- ❑ Persistent positive phase of the NAO – no blocking—storm track through or close to the NE
- ❑ Over 180” snow across parts of the Tug Hill plateau in New York and portions of interior northern Maine
- ❑ I-95 BOS to NYC regionally experienced less snow than normal
- ❑ Concern is for the above normal water content in the snowpack in northern New England
- ❑ Significant warmup forecast towards the end of the month....duration important to ice jam/river flooding



Current Snow Depth
Ending 12Z March 27, 2019



Source: NOAA/NWS Northeast River Forecast Center, Taunton, MA



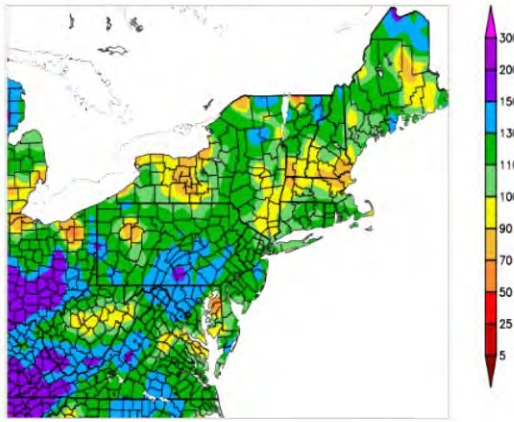


NRCC Precipitation Trends – % of Normal

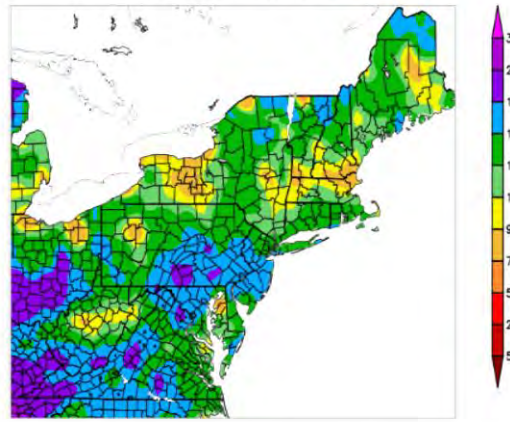


Year to date---Last 90days---Last 30 days

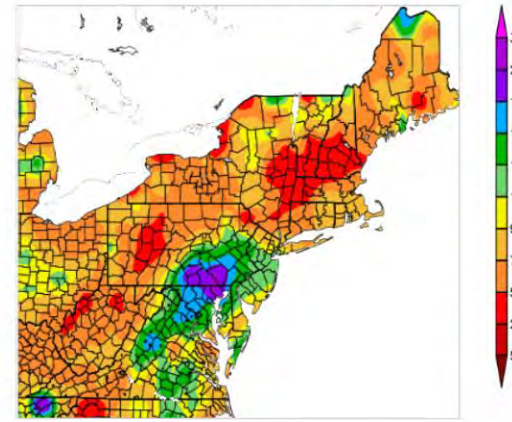
Percent of Normal Precipitation (%)
1/1/2019 – 3/26/2019



Percent of Normal Precipitation (%)
12/27/2018 – 3/26/2019



Percent of Normal Precipitation (%)
2/25/2019 – 3/26/2019



Generated 3/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

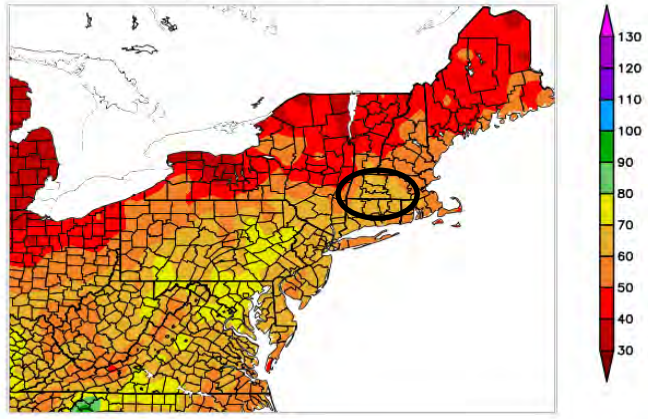
Generated 3/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

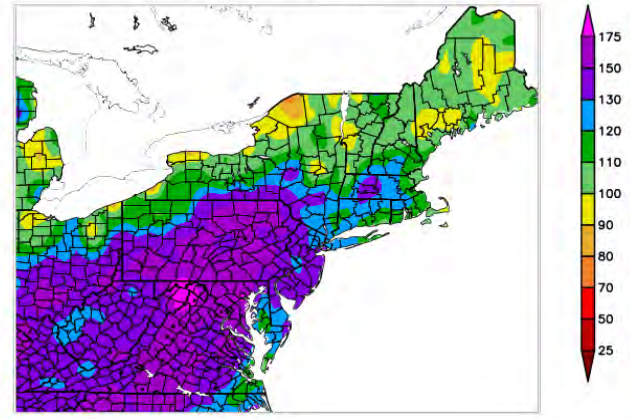
Generated 3/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Precipitation (in)
3/27/2018 – 3/26/2019



Percent of Normal Precipitation (%)
3/27/2018 – 3/26/2019



Generated 3/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

Generated 3/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

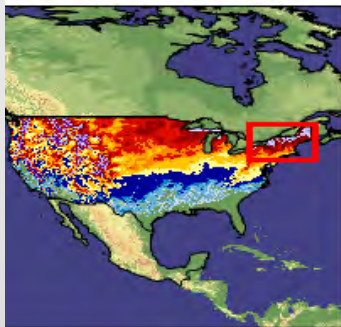
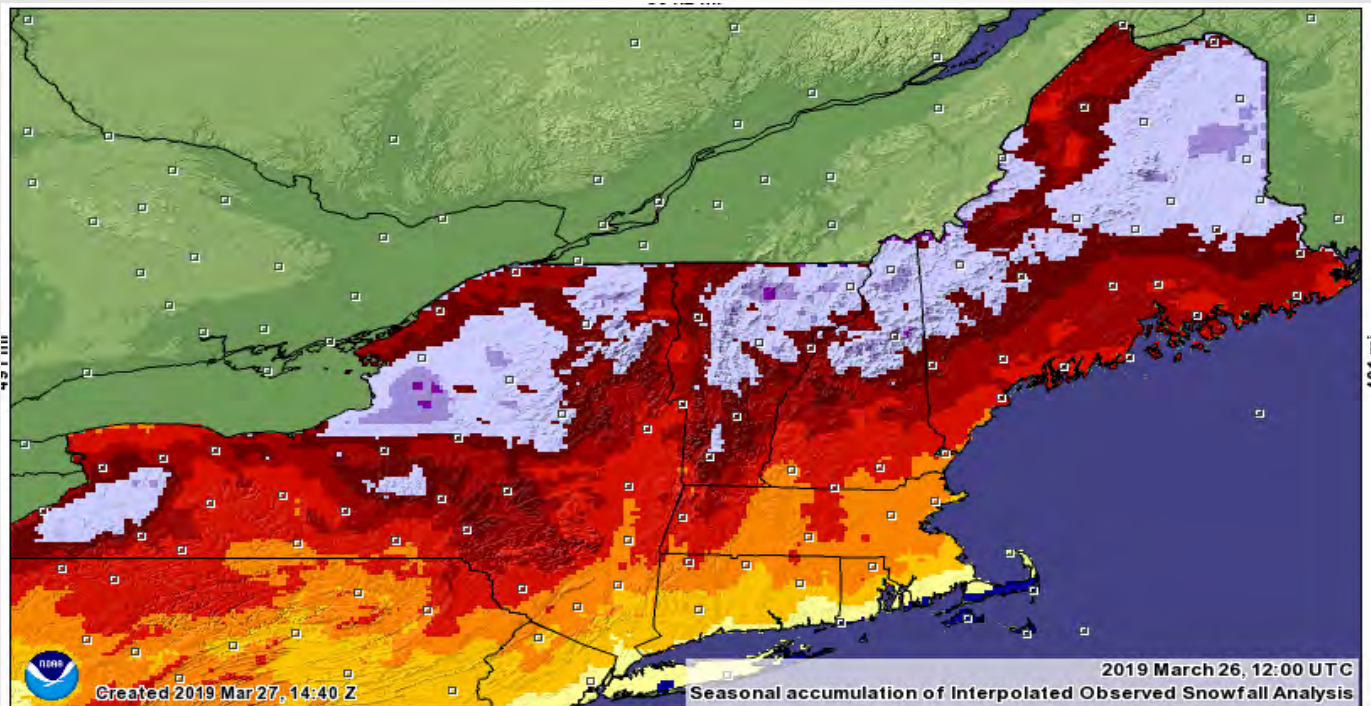


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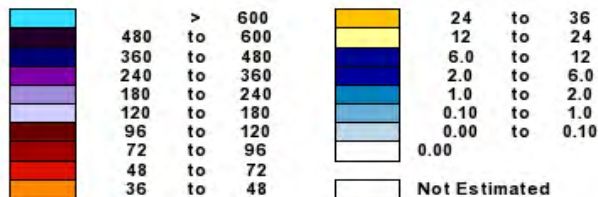


SNOW

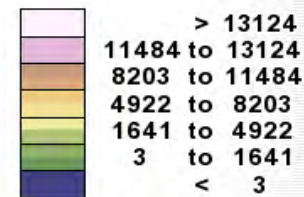
Seasonal Snowfall – March 26th



Inches of depth

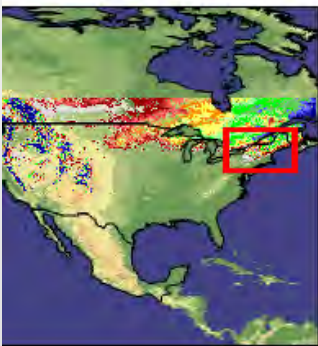
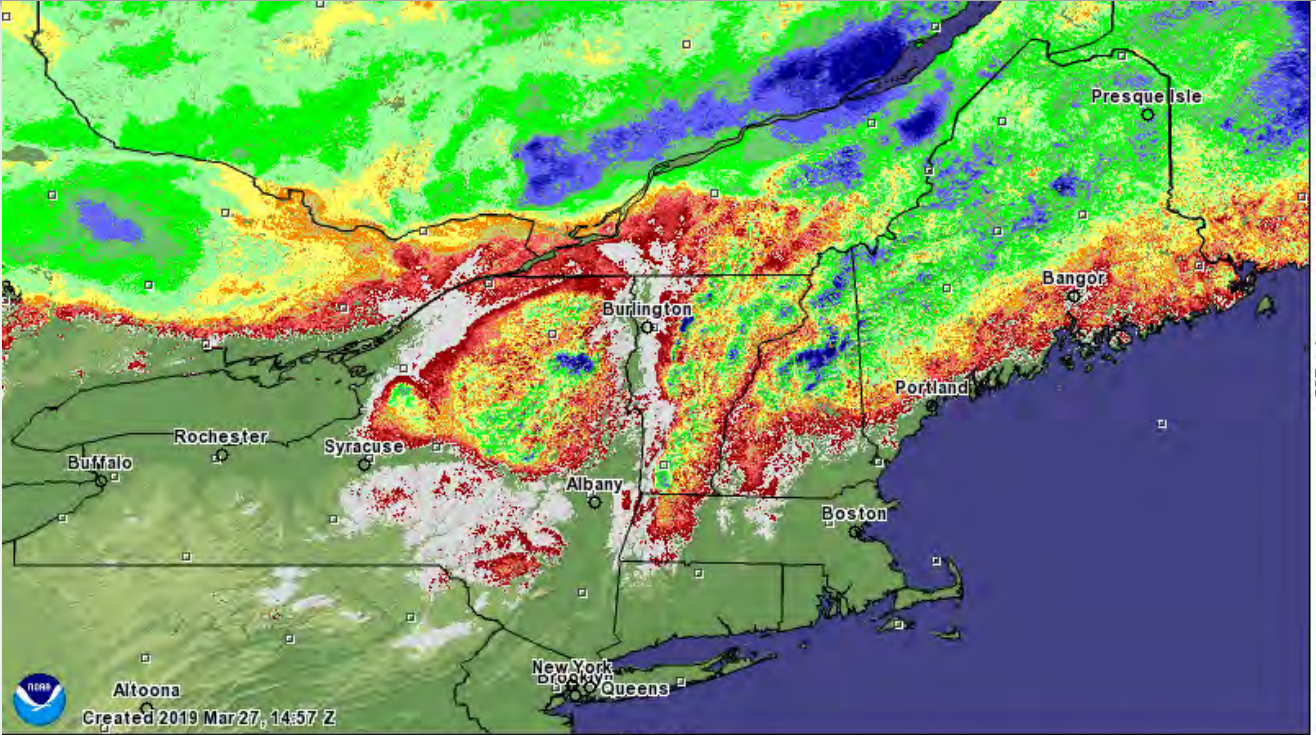


Elevation in feet

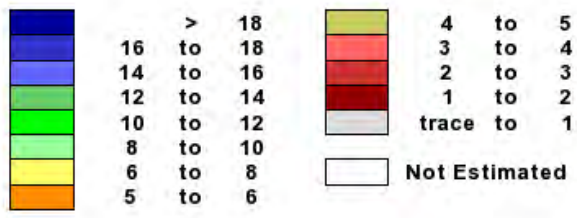




Snow Water Equivalent



Inches of water equivalent

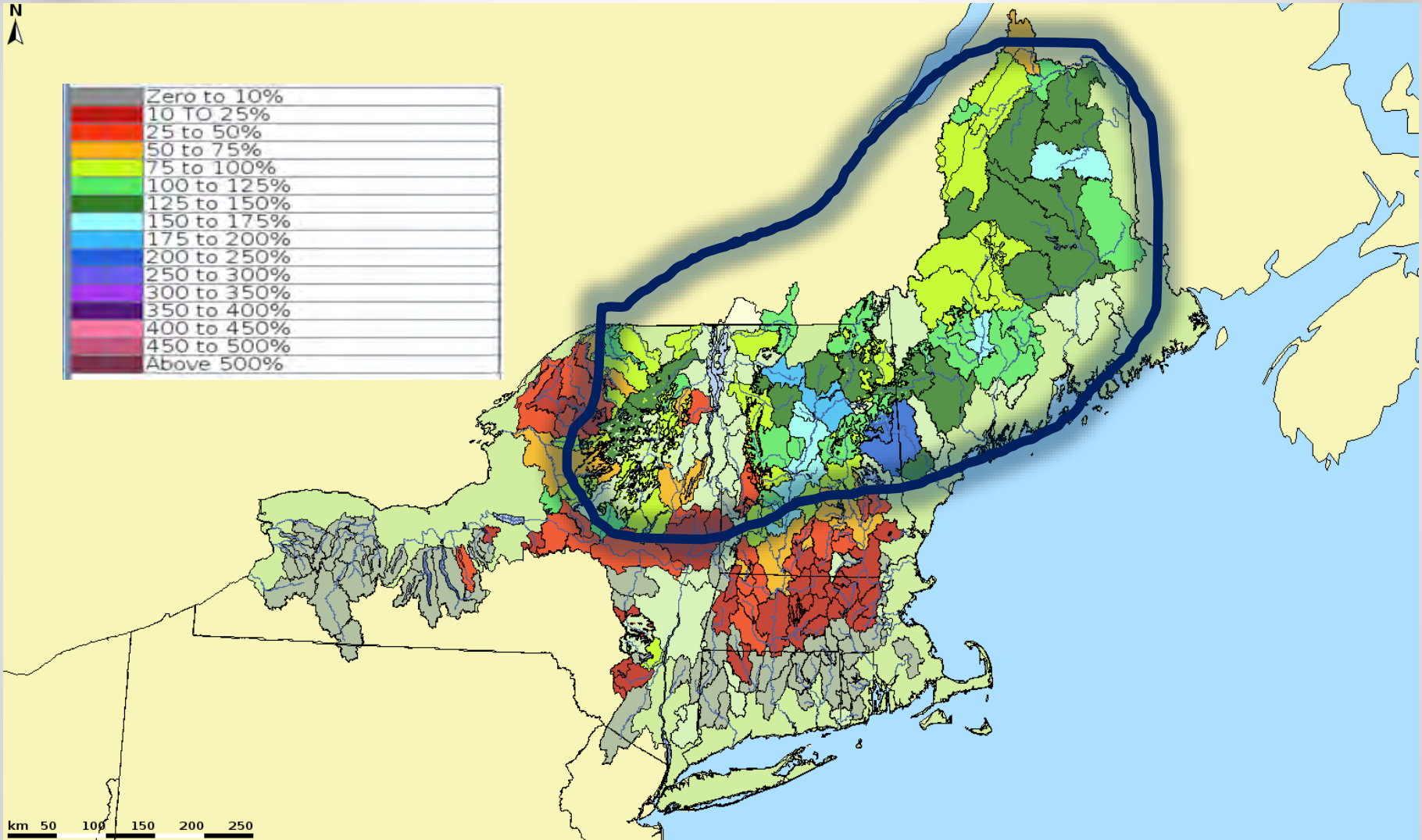


Elevation in feet

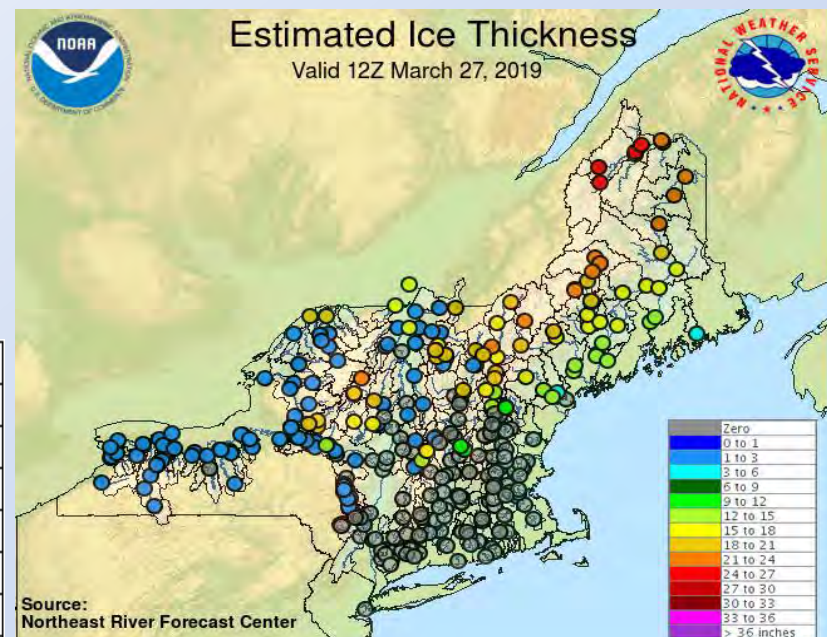




Modeled Snow Water Equivalent *Percent of Normal 3/27/2019*



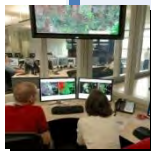
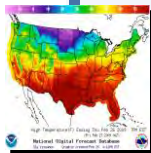
NORTHERN NY/NEW ENGLAND ICE JAM FLOOD POTENTIAL SENTINEL-2 SATELLITE IMAGES



River	City	State	Flooding / Damage
Aroostook River	Caribou	ME	
Piscataquis River	Dover-Foxcroft	ME	
St. John River	Grand Isle	ME	
Pleasant River	Milo	ME	
St. John River	St. John	ME	
Aroostook River	Washburn	ME	

National Weather Service

Protecting Lives and Property



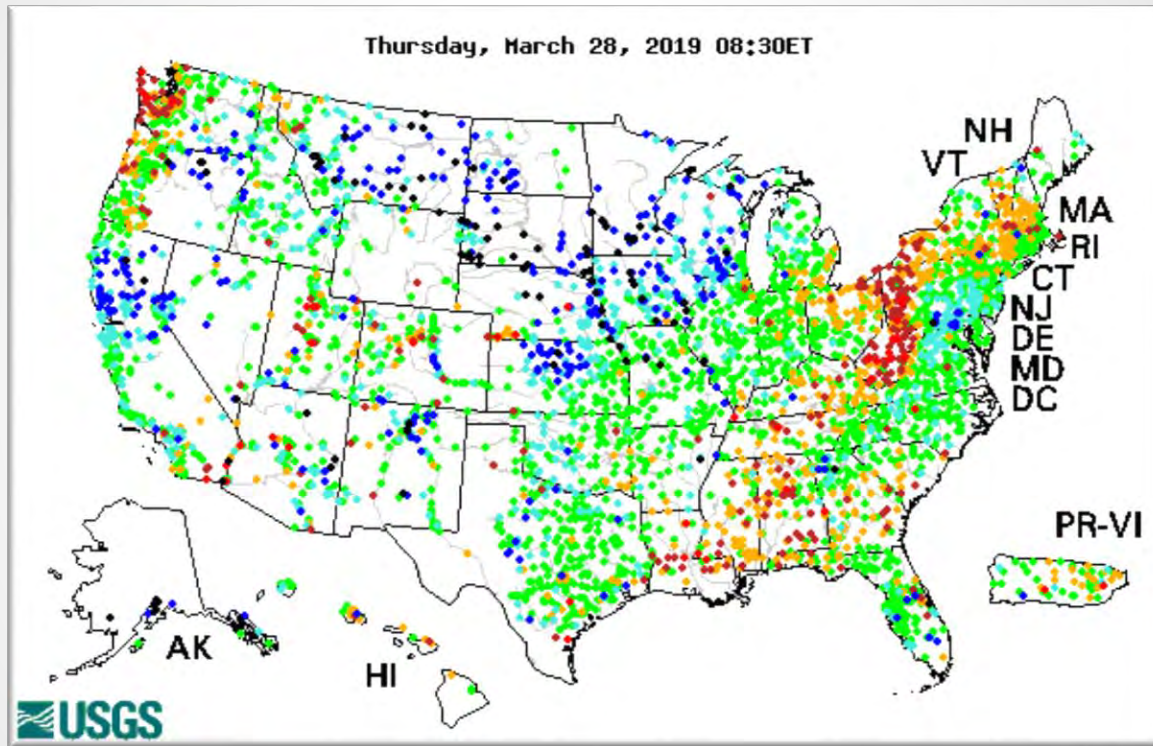


USGS Streamflow

Normal to Below Normal Flows



Current Daily Streamflow



Explanation - Percentile classes

Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

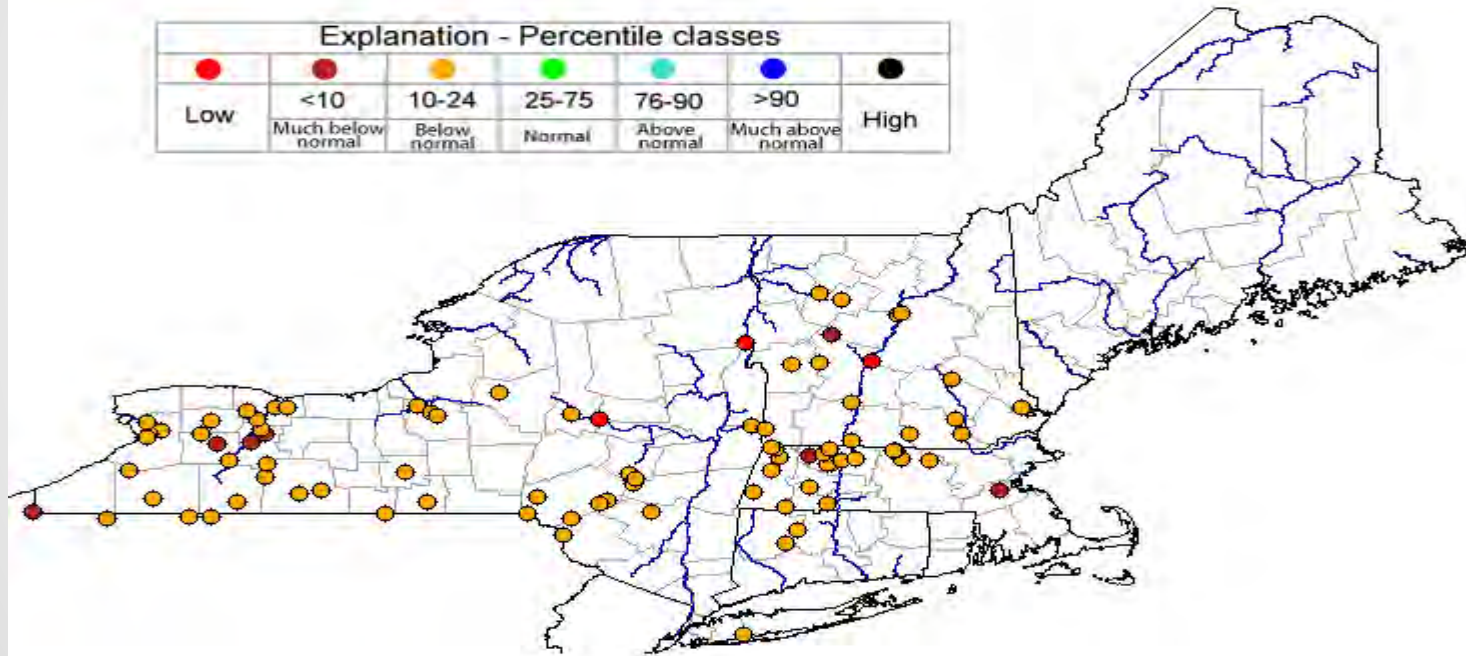




USGS 7-Day Average streamflow Conditions Increase in below Normal Streamflow....remainder Normal



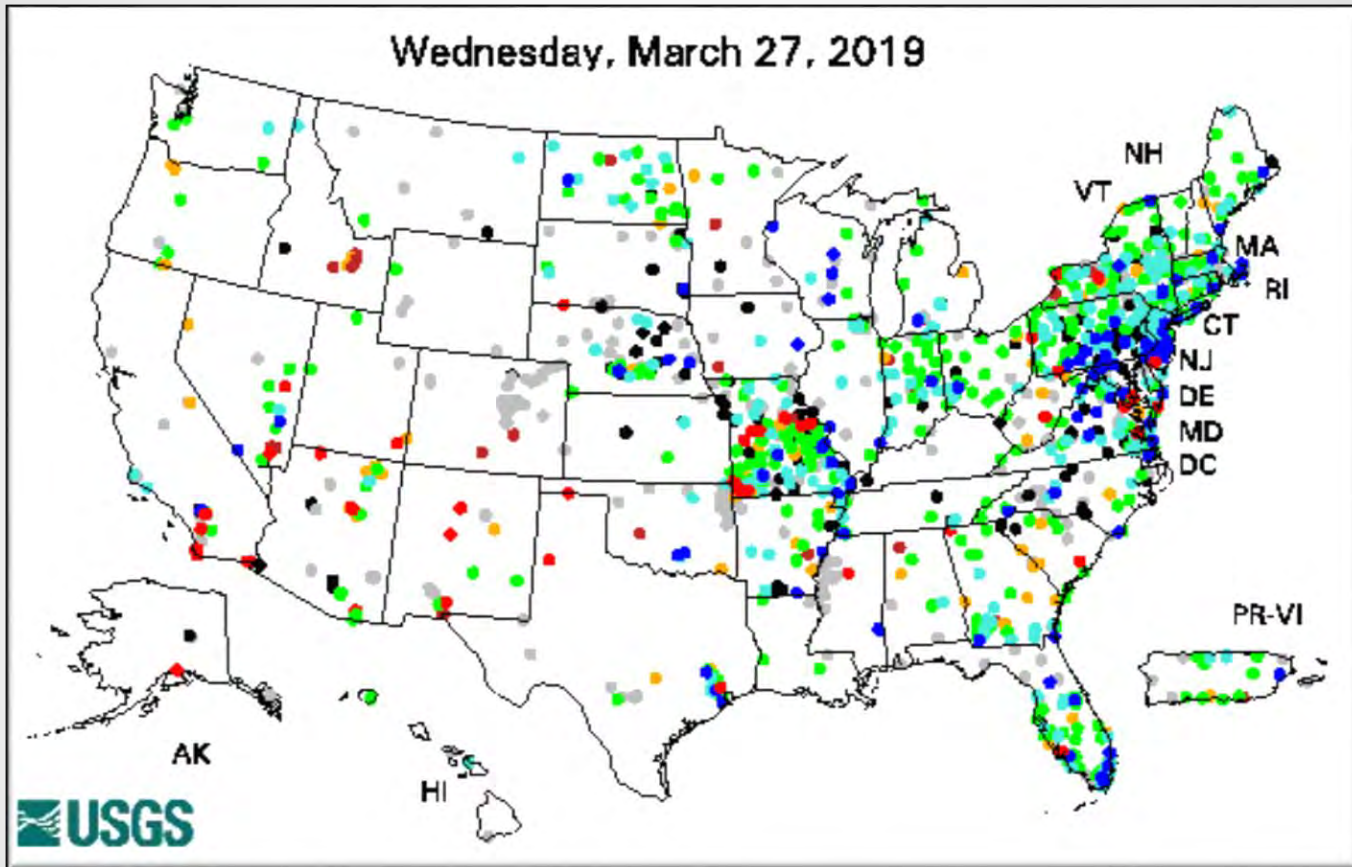
Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	





USGS Groundwater Conditions

Mainly normal to above normal levels



Explanation - Percentile classes (symbol color based on most recent measurement)							
Low	<10	10-24	25-75	76-90	>90	High	Not Ranked
	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal		

Real Time
 Continuous
 Periodic Measurements

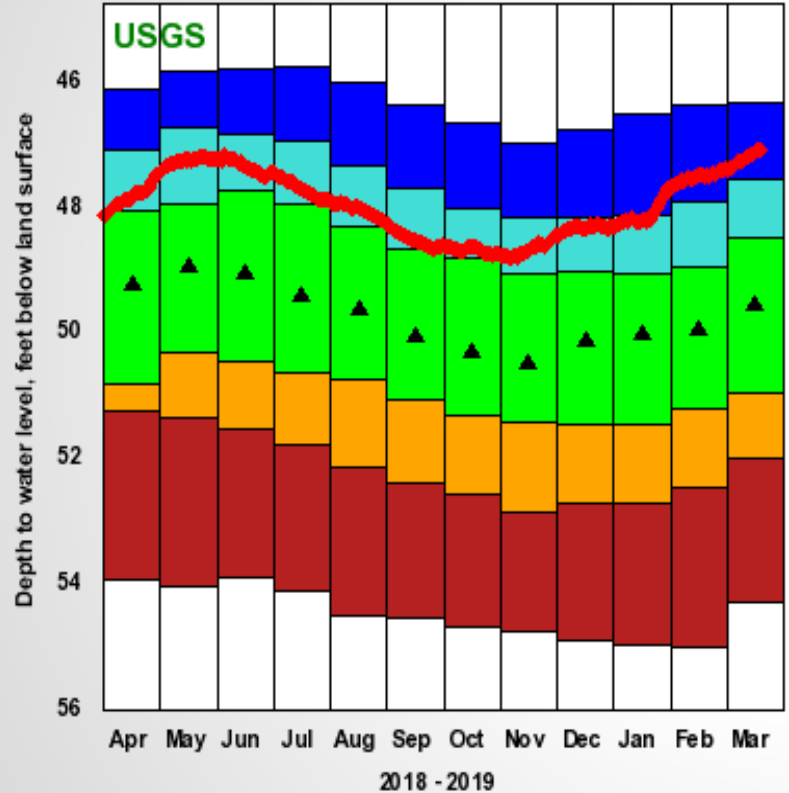




USGS Groundwater Wells

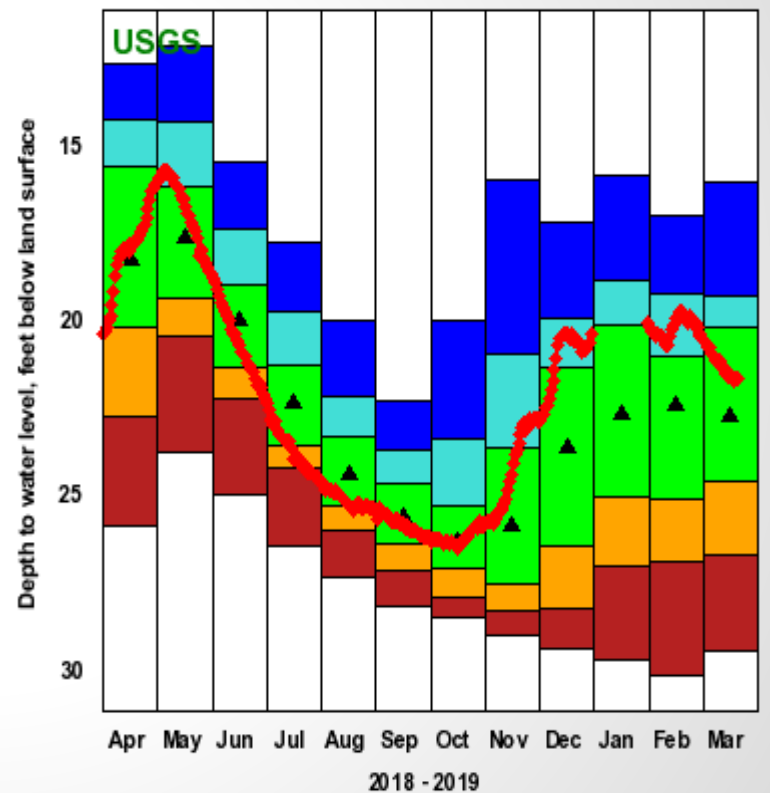


414124070265901 - MA-SDW 253 SANDWICH, MA



Plot created 03/21/19 14:34

433112075091501 - Local number, Oe-151, at Woodgate NY



Plot created 03/21/19 14:58



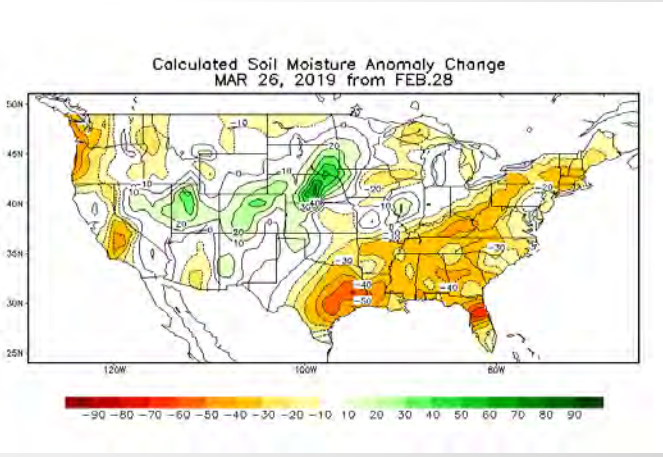
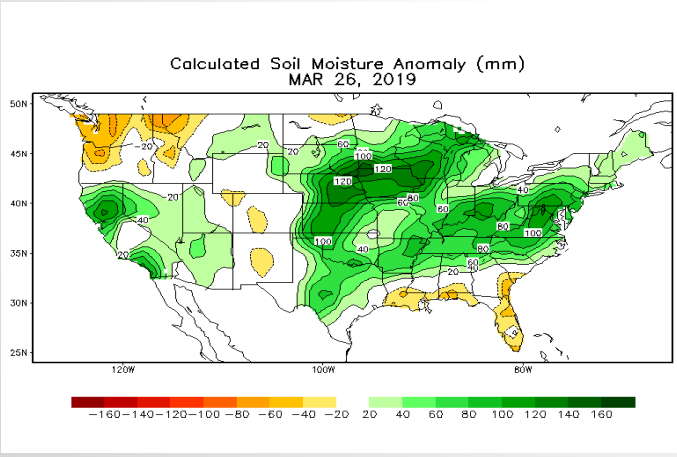
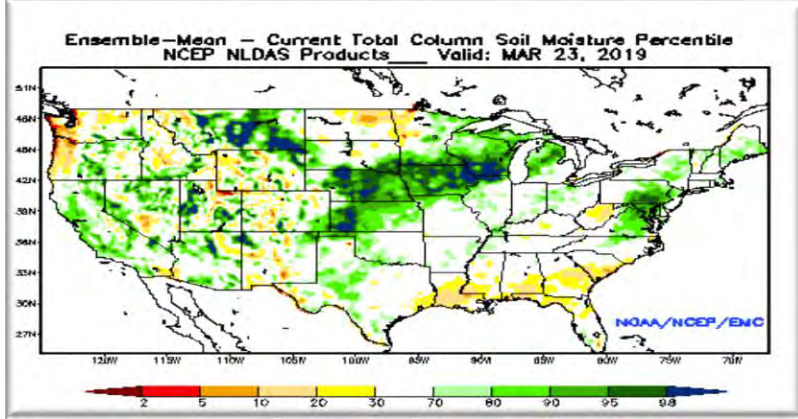
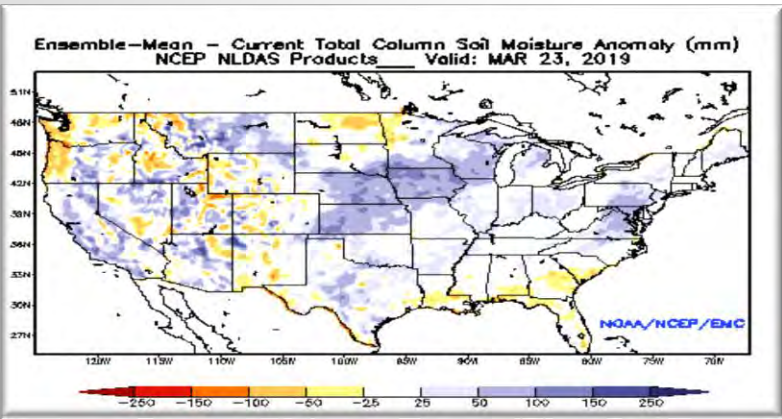


Soil Moisture Current Conditions

Departures and Percentiles



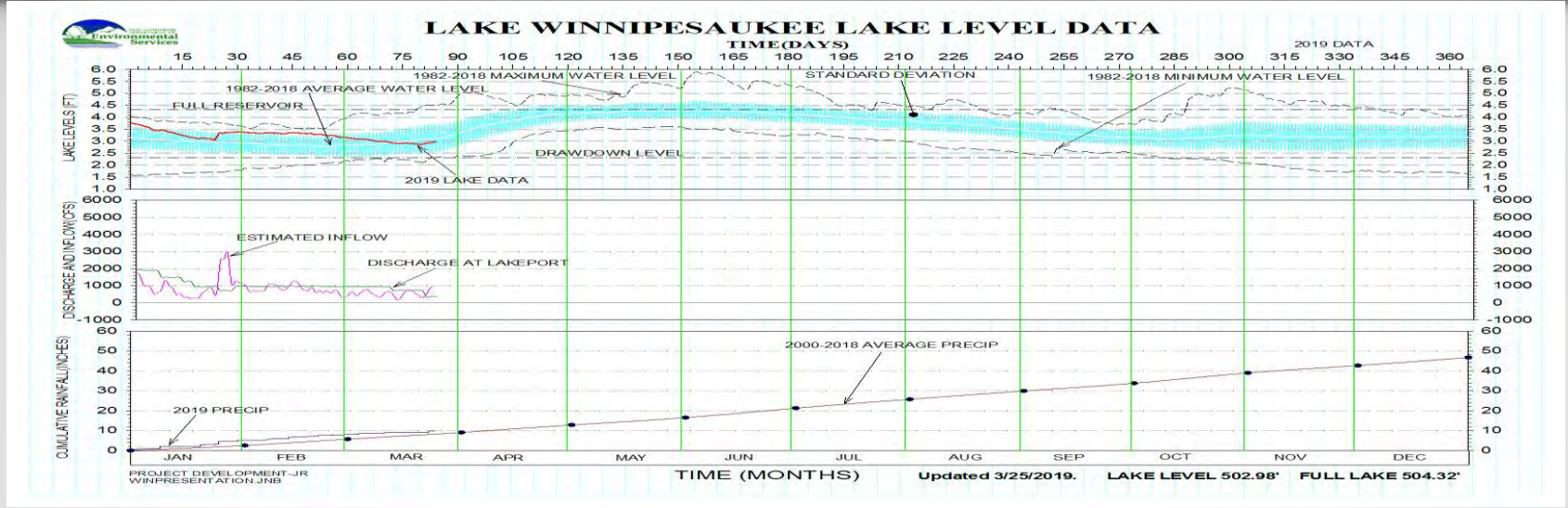
The NLDAS experimental drought monitor is derived from near real-time soil moisture output from both the NASA MOSAIC and NCEP Noah land surface models. The anomalies and percentiles are based on a 28 year climatology (1980 - 2007). Two separate climatology files are used; one for the calculation of anomalies, and one for the calculation of percentiles. The anomaly climatology file contains 1 soil moisture value per day (daily average over 28 years) for each gridbox. The percentile climatology file contains 140 soil moisture values per day (5 for each year) for each gridbox.





Larger Lake Levels

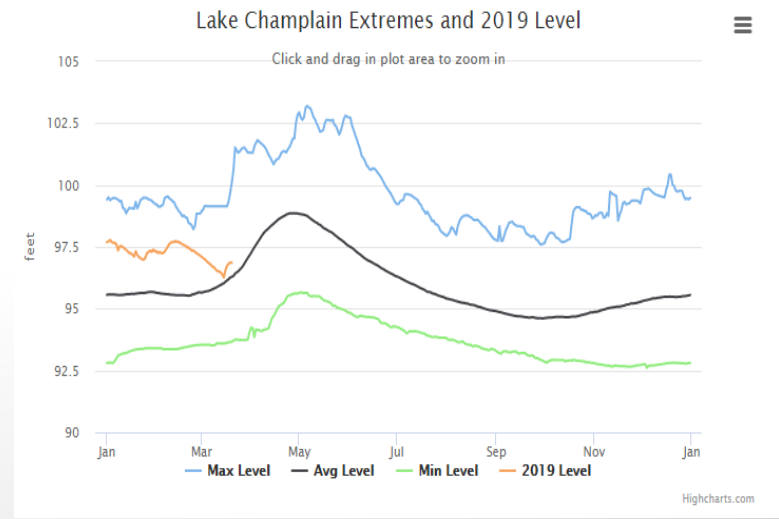
All NEAR normal Lake Levels



Kennebec -- >Normal to above normal
 Androscoggin -- >Normal to above Normal

March 1, 2019

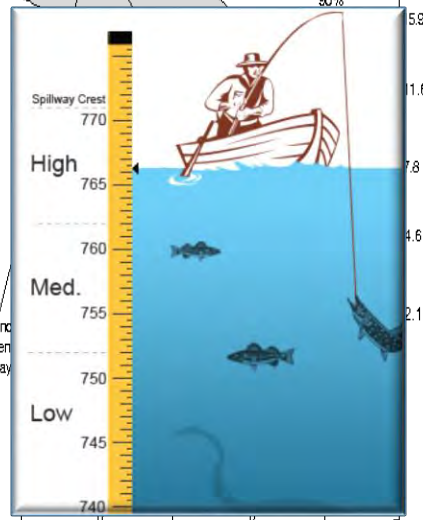
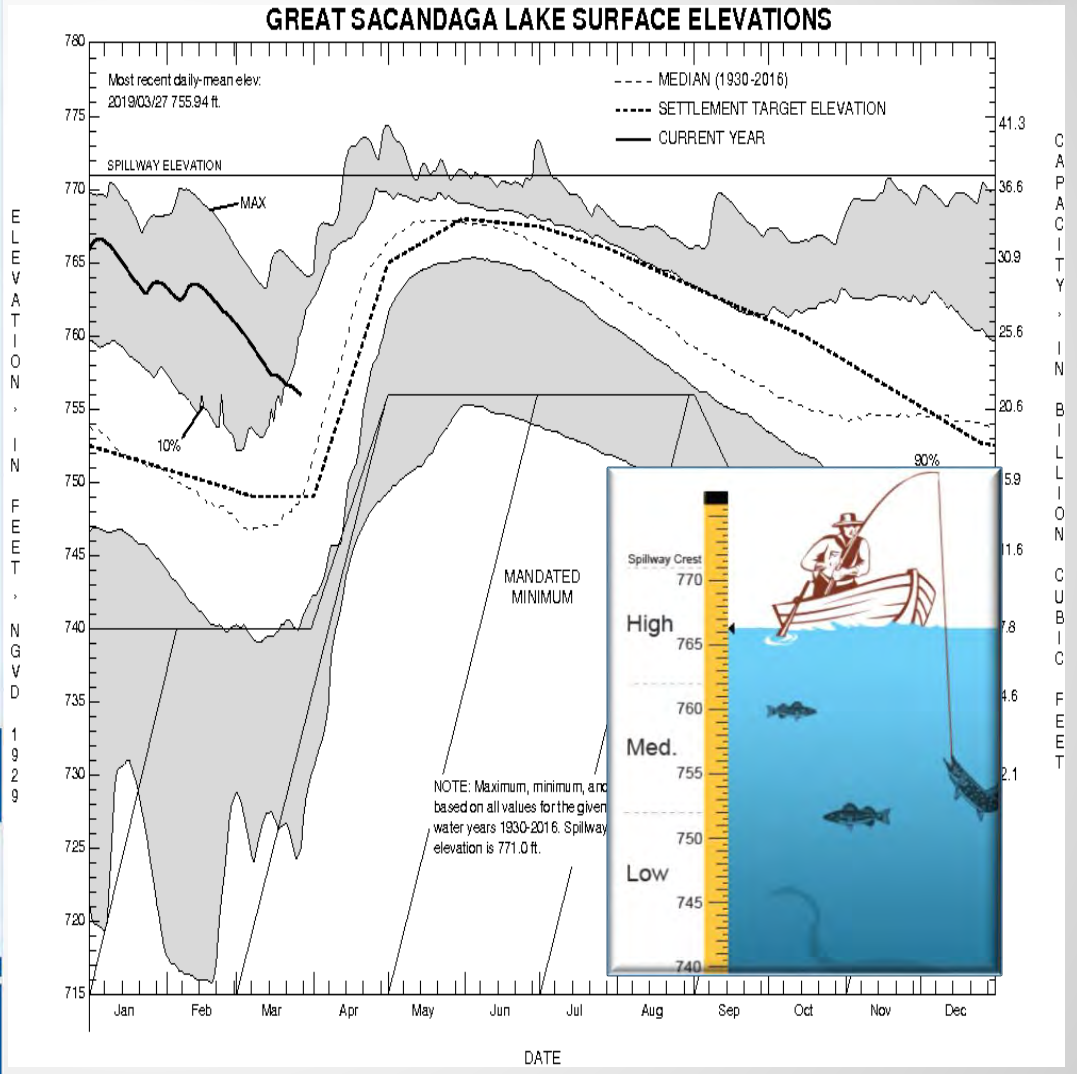
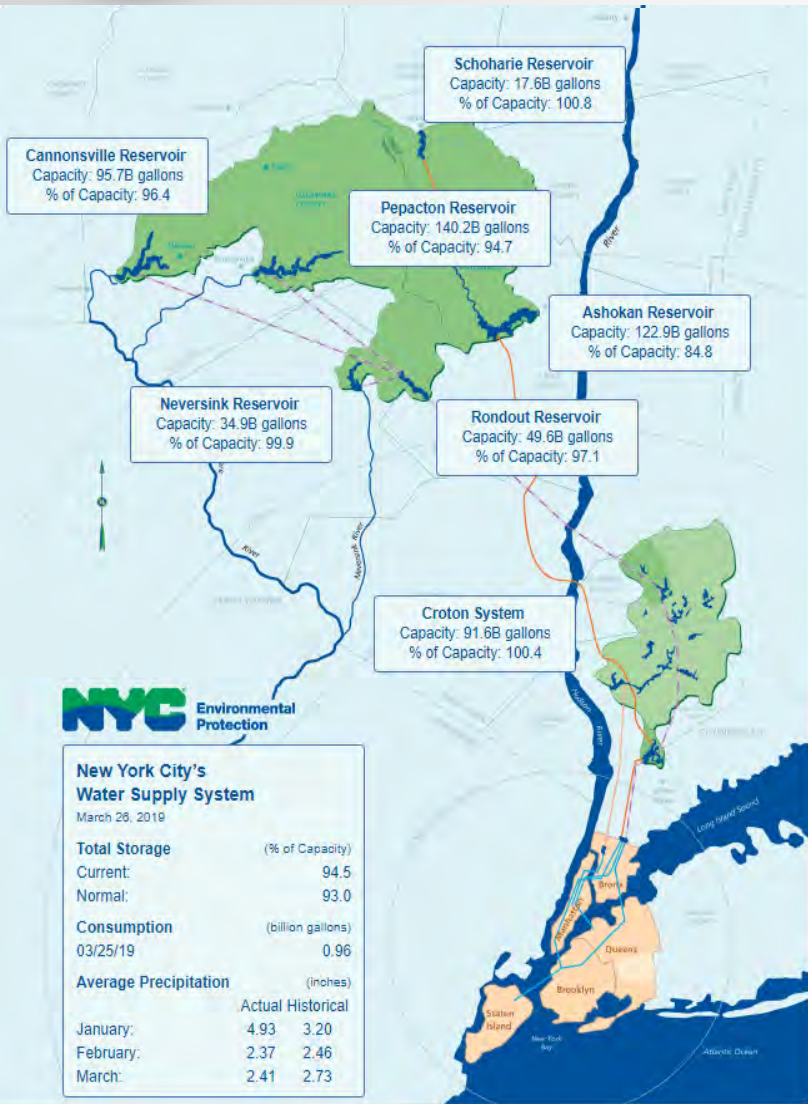
RESERVOIR LEVELS: The Quabbin Reservoir, the largest water supply source for 47 communities in the Metro Boston area, is currently at **100.2%** of its 412 billion-gallon maximum capacity. The 65 billion-gallon Wachusett Reservoir is **91.3%** full.





Water Supply – Lake Levels

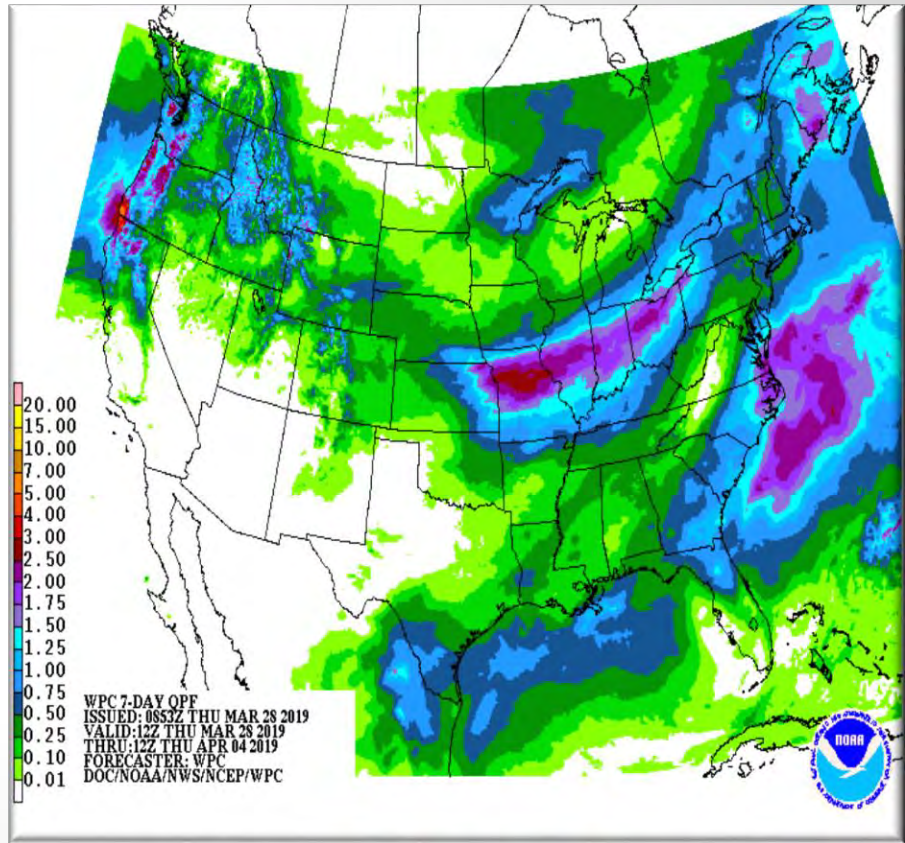
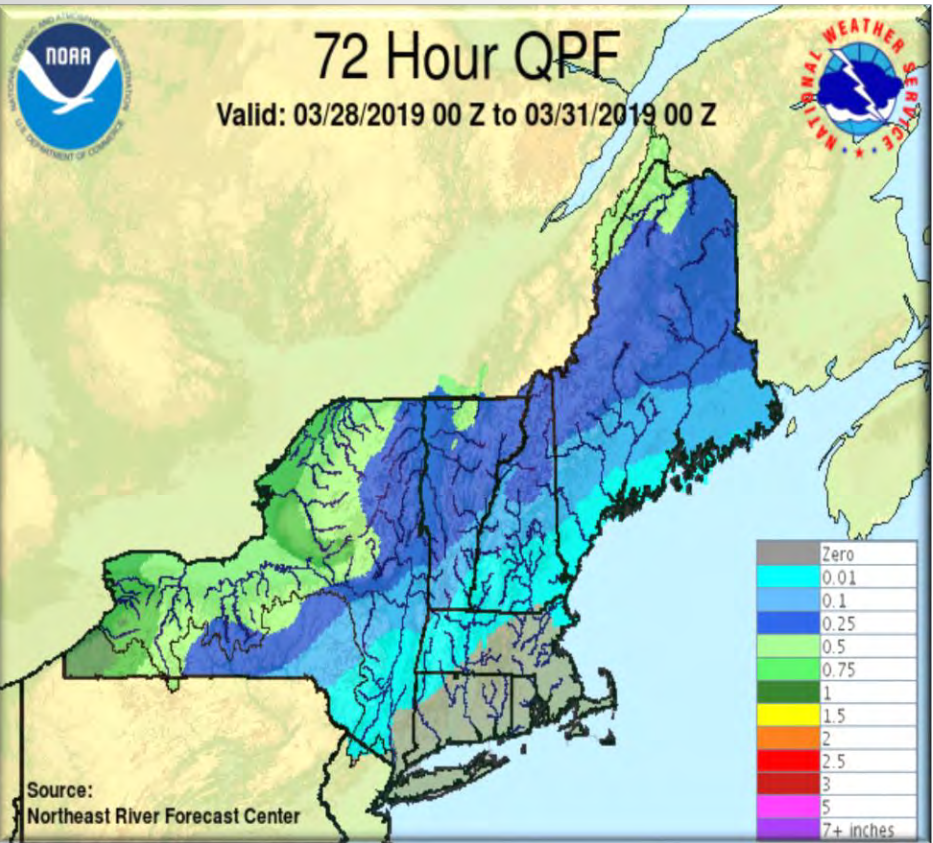
NYC and Great Sacandaga – Normal





Precipitation Forecast

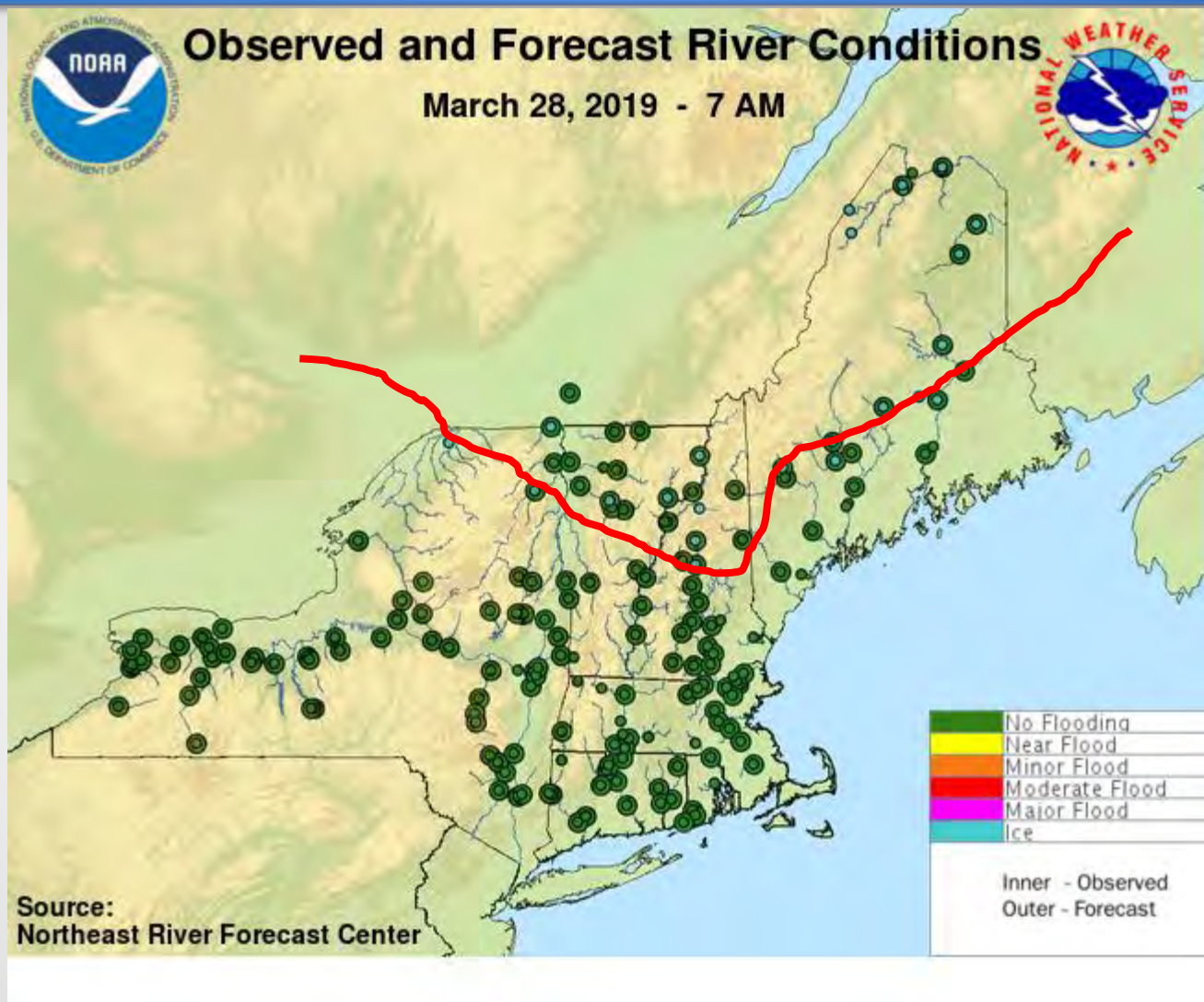
3-Day and 7-Day





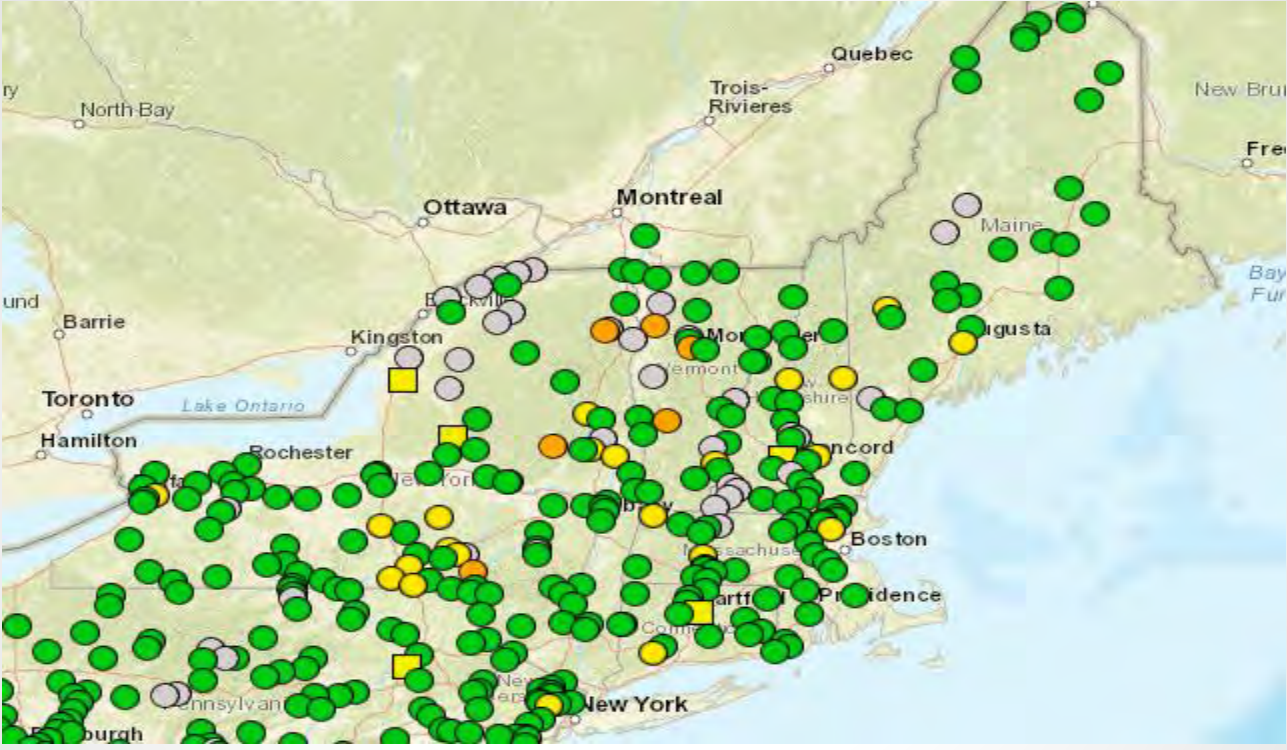
NERFC 72-Hr River Forecast

No flooding in the near Term





North American Ensemble Forecast System



News Legend			
News Items less than 24 hours old	News Items 1 to 7 days old	No current News Items	
Map Legend			
Chance of Exceedance		River Forecast Centers	
30%	Level	70%	
●	Action	■	Middle Atlantic River Forecast Center
●	Minor Flood	■	Northeast River Forecast Center
●	Moderate Flood	■	Ohio River Forecast Center
●	Major Flood	■	Southeast River Forecast Center
● = less than 30% chance of reaching Action level			
○ = no critical levels defined for this point			

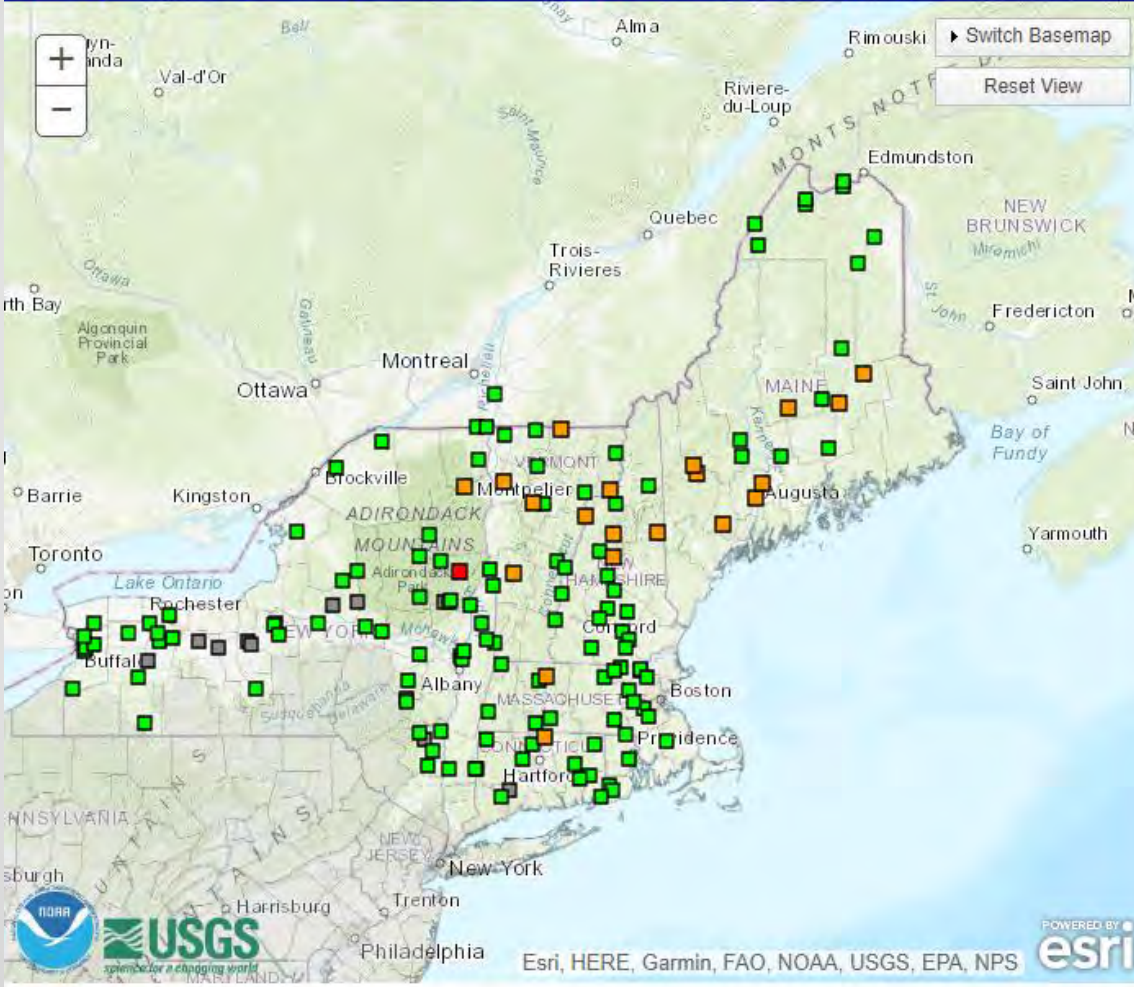


Building a Weather-Ready Nation



Streamflow Outlook

Greater than: **50%** chance of exceeding river flood levels during **Mar-Apr-May**



[Return to national map.](#)

Click on the map or select one of the data views below:

- United States
- NWS Weather Forecast Offices
- Northeast River Forecast Center
- Water Resources Regions

153 total gauges
 Show locations with 50% or greater chance of flooding during Mar-Apr-May (21)

- 0 Gauges: > 50% Major Long-Range Flood Risk
- 1 Gauges: > 50% Moderate Long-Range Flood Risk
- 20 Gauges: > 50% Minor Long-Range Flood Risk
- 120 Gauges: < 50% Long-Range Flood Risk
- 12 Gauges: No forecast within selected timeframe

[Show all locations](#)

Last map update:
 03/28/2019 at 08:37:16 am EDT
 03/28/2019 at 12:37:16 UTC

- [What is UTC time?](#)
- [Map Help](#)
- [Product Description](#)
- [Feedback](#)
- [Disclaimer](#)



Building a Weather-Ready Nation



Mattawamkeag River Maine Hydrologic Ensemble Forecast System (HEFS)

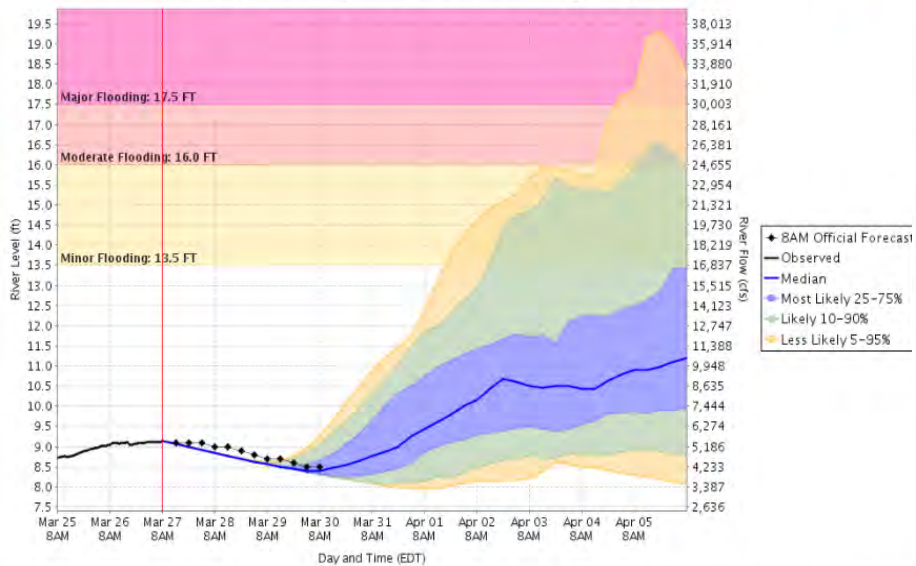


10 Day River Level Probabilities

Used to Estimate the Range of Possible River Levels
[without ENSPOST (Experimental)]

Caution: Official forecast may be updated after this graph is generated.
For the latest official forecast, go to <http://water.weather.gov/ahps>

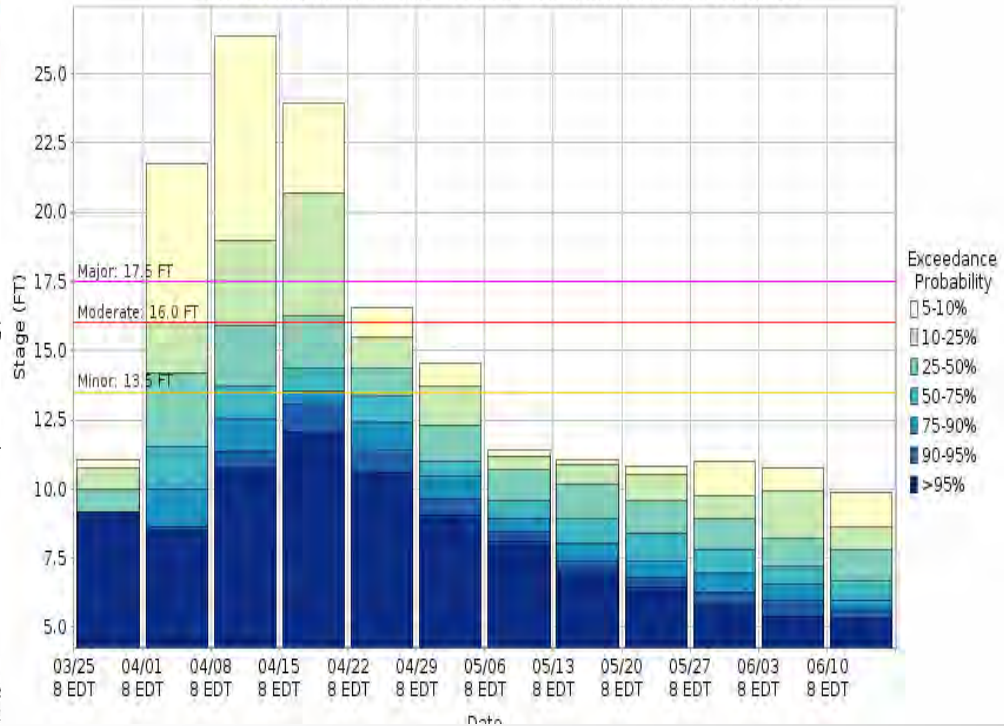
Mattawamkeag River at Mattawamkeag, ME (MATM1)



Model runtime: 08:00 AM EDT Mar 27 2019
Northeast River Forecast Center



Weekly Chance of Exceeding River Stage at Mattawamkeag River at Mattawamkeag, ME (MATM1) Forecast for the period 03/25/2019 - 06/23/2019 This is a conditional simulation based on the current conditions as of 03/25/2019





Aroostook River Maine Masardis, Maine (HEFS)

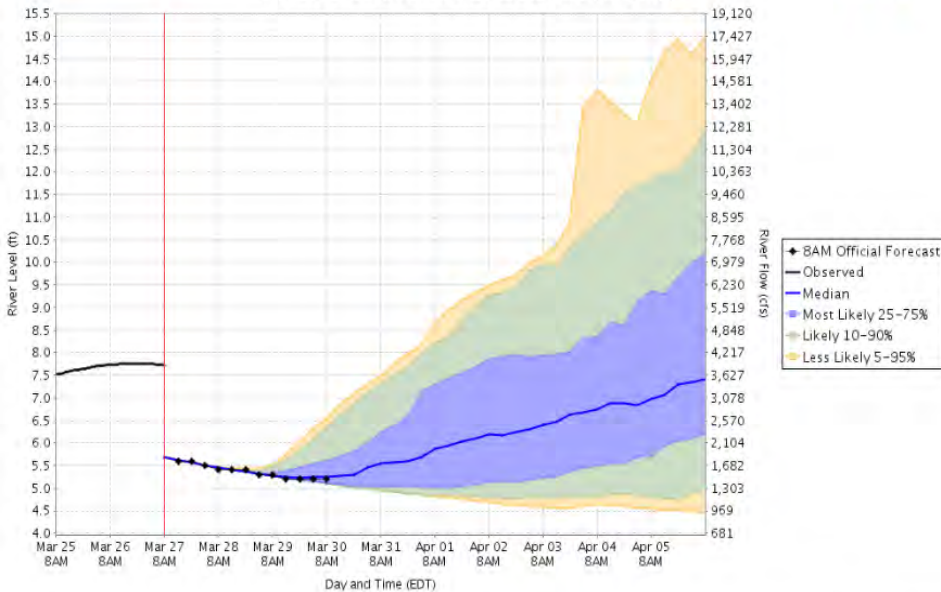


10 Day River Level Probabilities

Used to Estimate the Range of Possible River Levels
[without ENSPOST (Experimental)]

Caution: Official forecast may be updated after this graph is generated.
For the latest official forecast, go to <http://water.weather.gov/ahps>

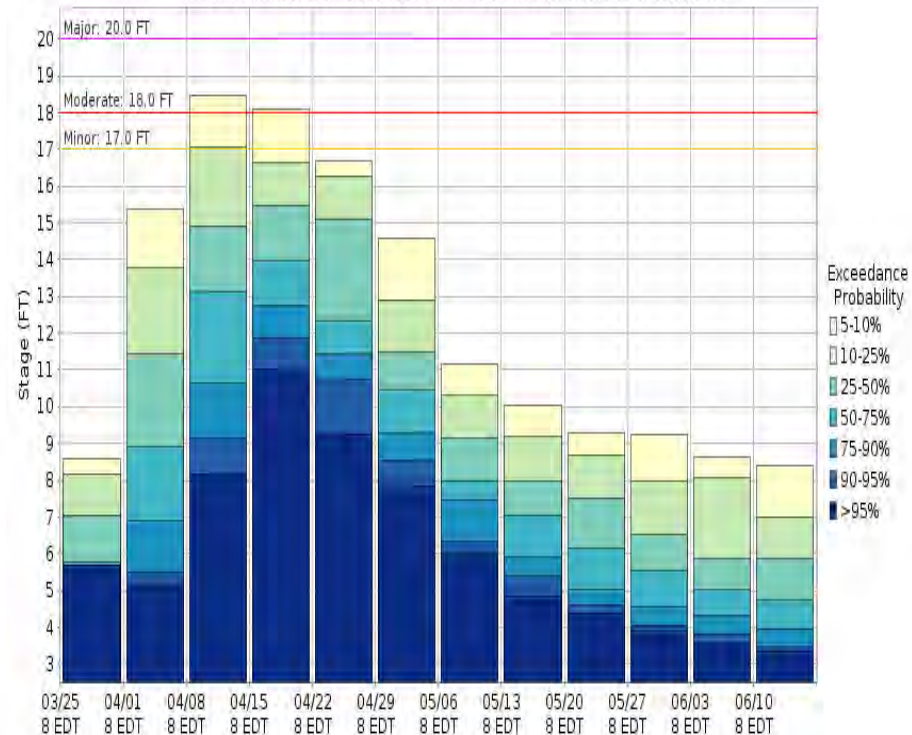
Aroostook River at Masardis, ME (MASM1)



Model runtime: 08:00 AM EDT Mar 27 2019
Northeast River Forecast Center



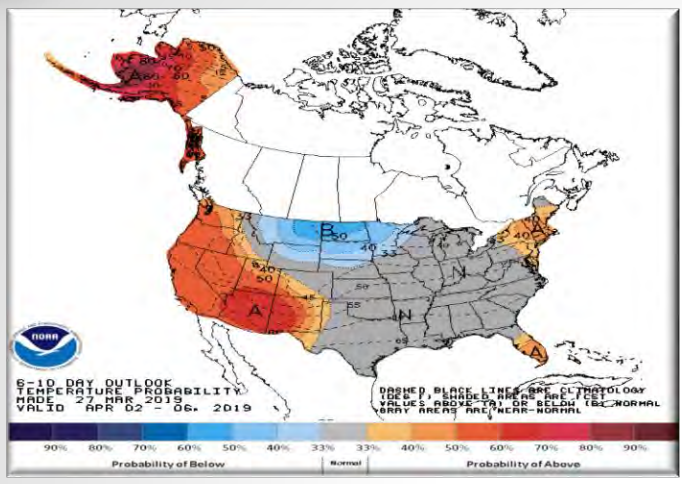
Weekly Chance of Exceeding River Stage at Aroostook River at Masardis, ME (MASM1)
Forecast for the period 03/25/2019 - 06/23/2019
This is a conditional simulation based on the current conditions as of 03/25/2019



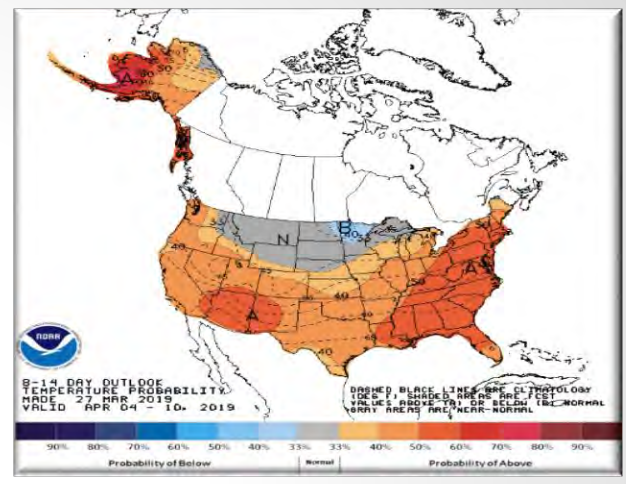


CPC Outlooks

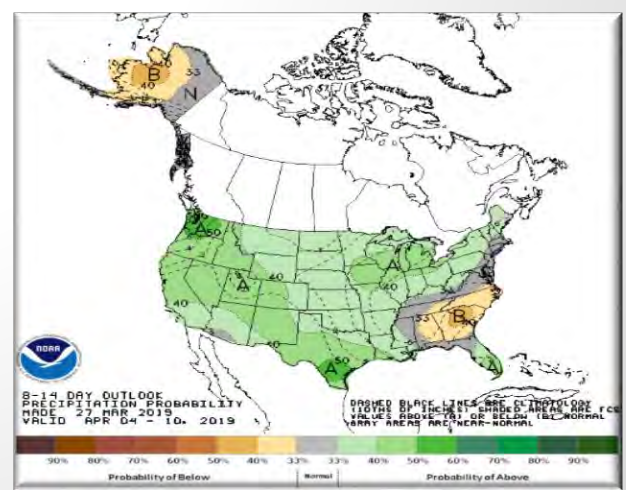
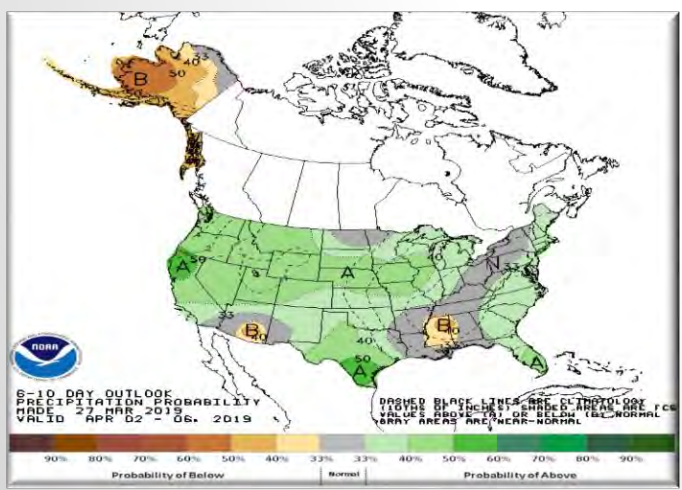
6 to 10 and 8 to 14 day outlooks



6 to 10 day outlooks

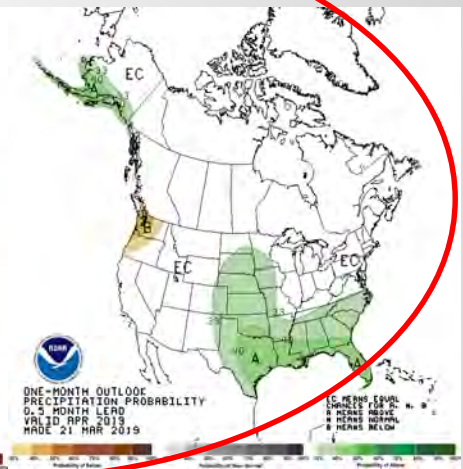
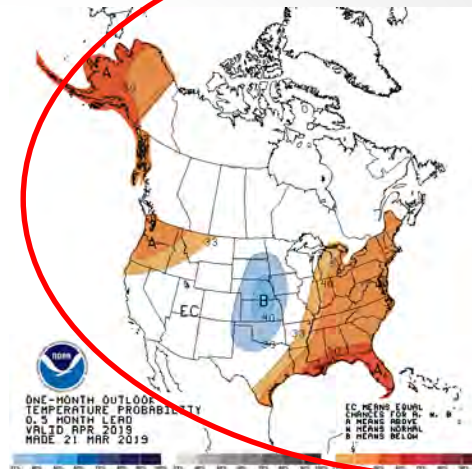
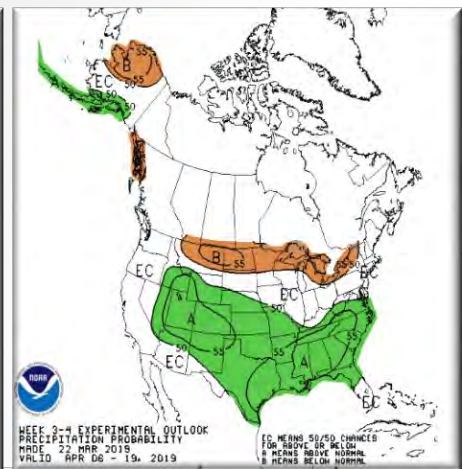
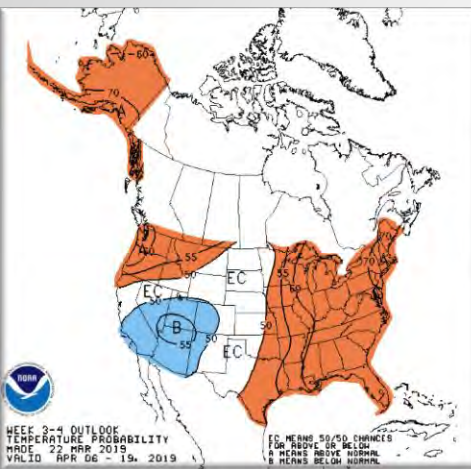


8 to 14 day outlooks



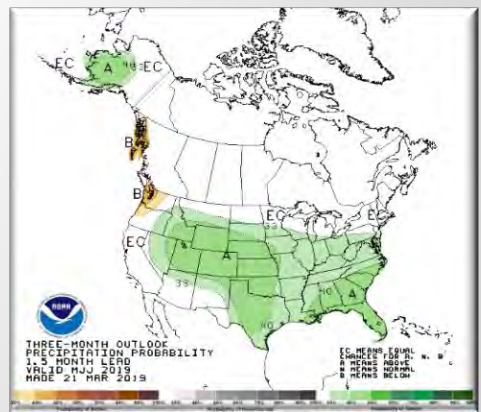
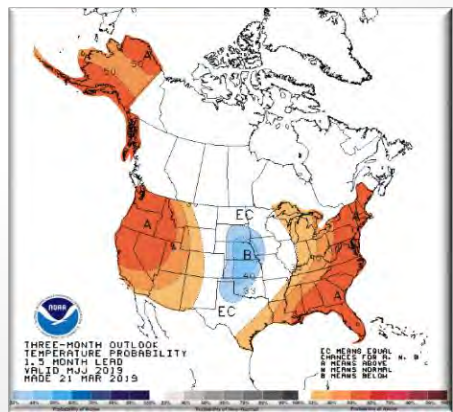


Outlook....Focus on Just updated APRIL



The shading on the temperature map depicts the most favored category, either above-normal (A) or below-normal (B) with the solid lines giving the probability (>50%) of this more likely category (above or below).

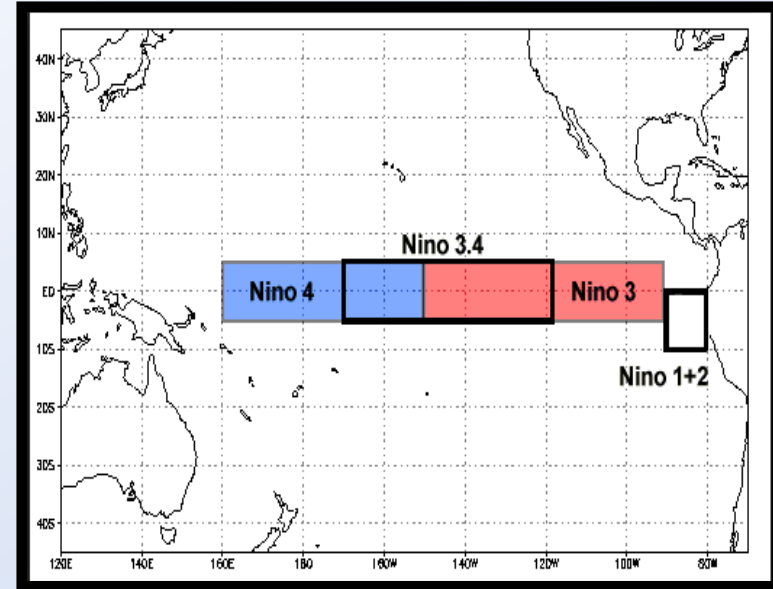
The shading on the precipitation map depicts the most favored category, either above-median (A) or below-median (B) with the solid lines giving the probability (>50%) of this more likely category (above or below).



Pattern Recognition --Teleconnections

– Affect Precip/Temp - Can Have Implications on River Flow

- **El Nino Southern Oscillation (ENSO)*
- **North Atlantic Oscillation (NAO)*
- **Arctic Oscillation (AO)*
- **East Pacific Oscillation (EPO)*
- **Pacific North American Index (PNA)*
- SST Anomalies (SSTA) Pacific/Atlantic
- Pacific Decadal Oscillation (PDO)
- Atlantic Multi-Decadal Oscillation (AMO)
- Quasi-Biennial Oscillation (QBO)
- Southern Oscillation Index (SOI)
- **Madden-Julian Oscillation (MJO)*
- **Tropical North Atlantic (TNA)*
- Stratospheric Trends and Temp Anomalies
- Solar Trends – geomagnetic activity, solar flux, sunspots
- Pattern Persistence – Analog Years



- The term "teleconnection pattern" refers to a recurring and persistent, large-scale pattern of pressure and circulation anomalies that spans vast geographical areas.

** May have impact on NE Weather Conditions...especially in Winter season*

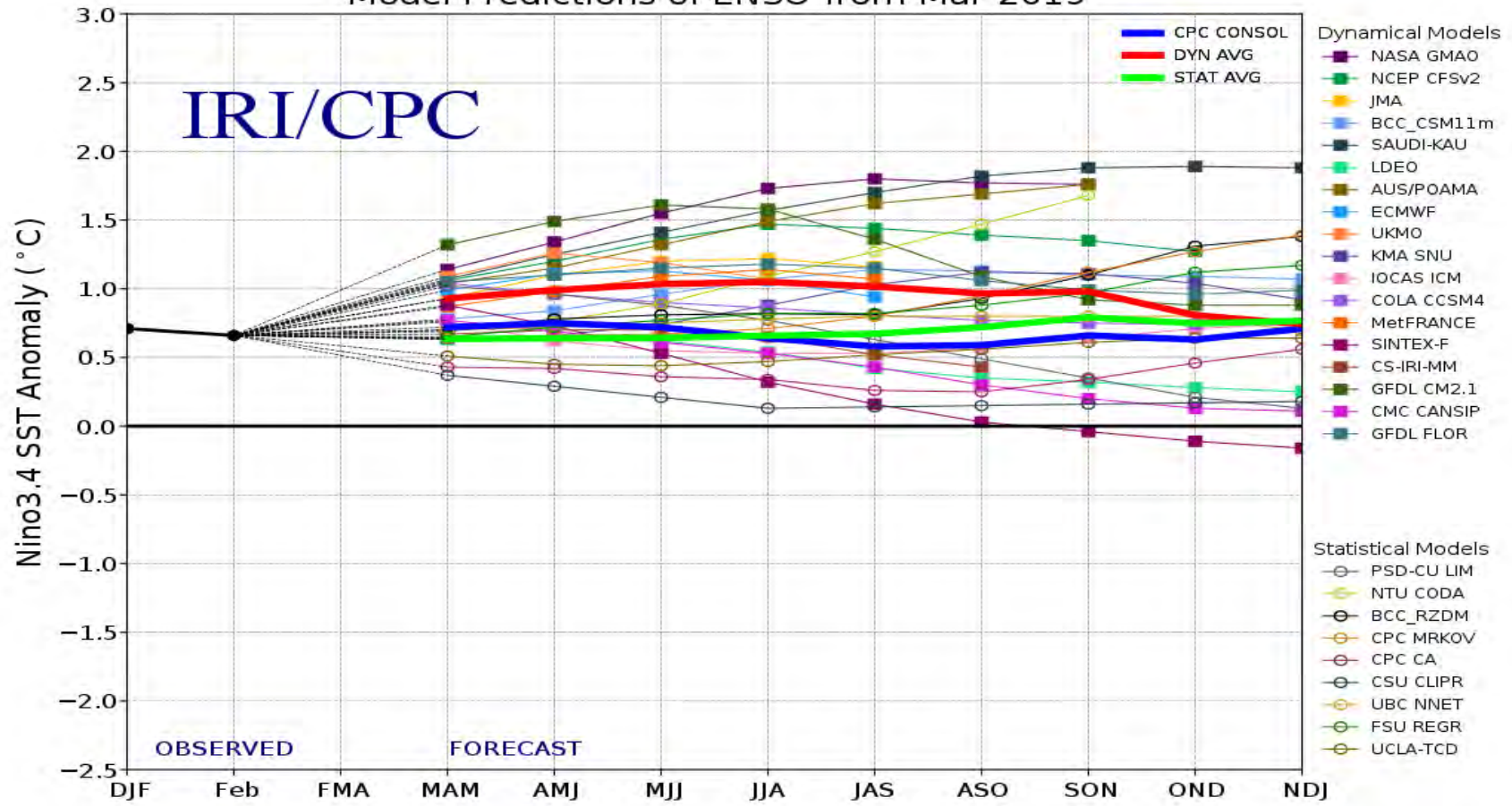


Current ENSO Conditions

El Nino Continues



Model Predictions of ENSO from Mar 2019



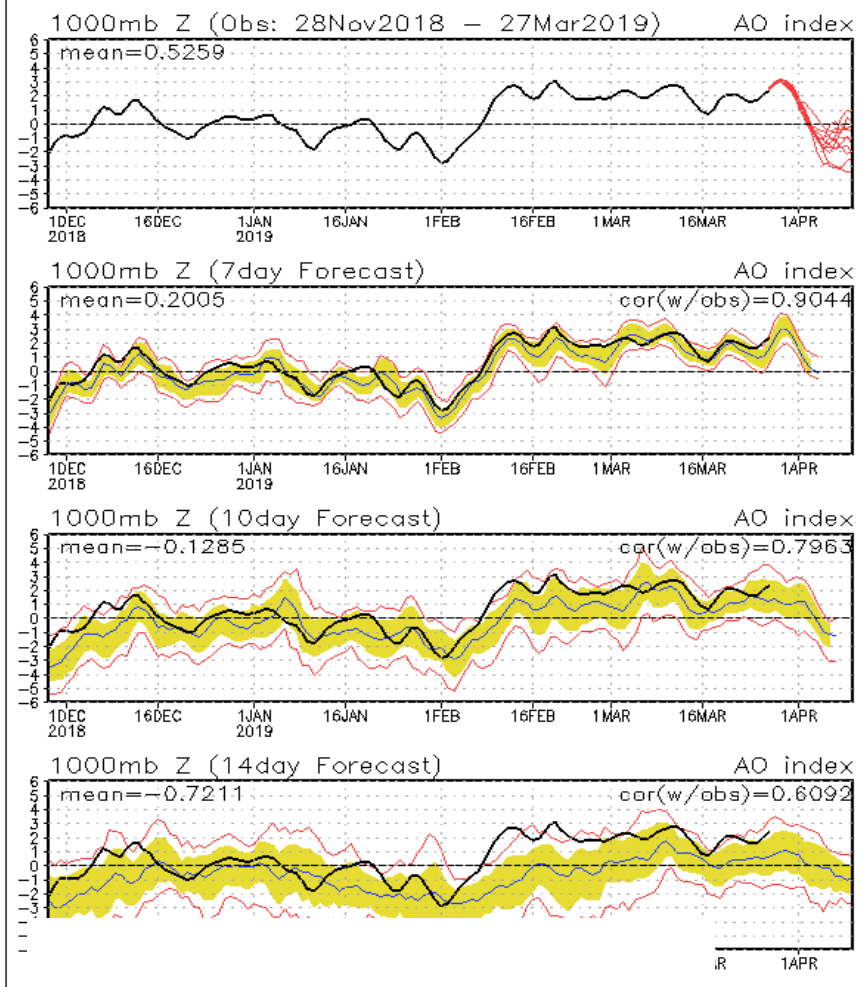


Teleconnection Patterns

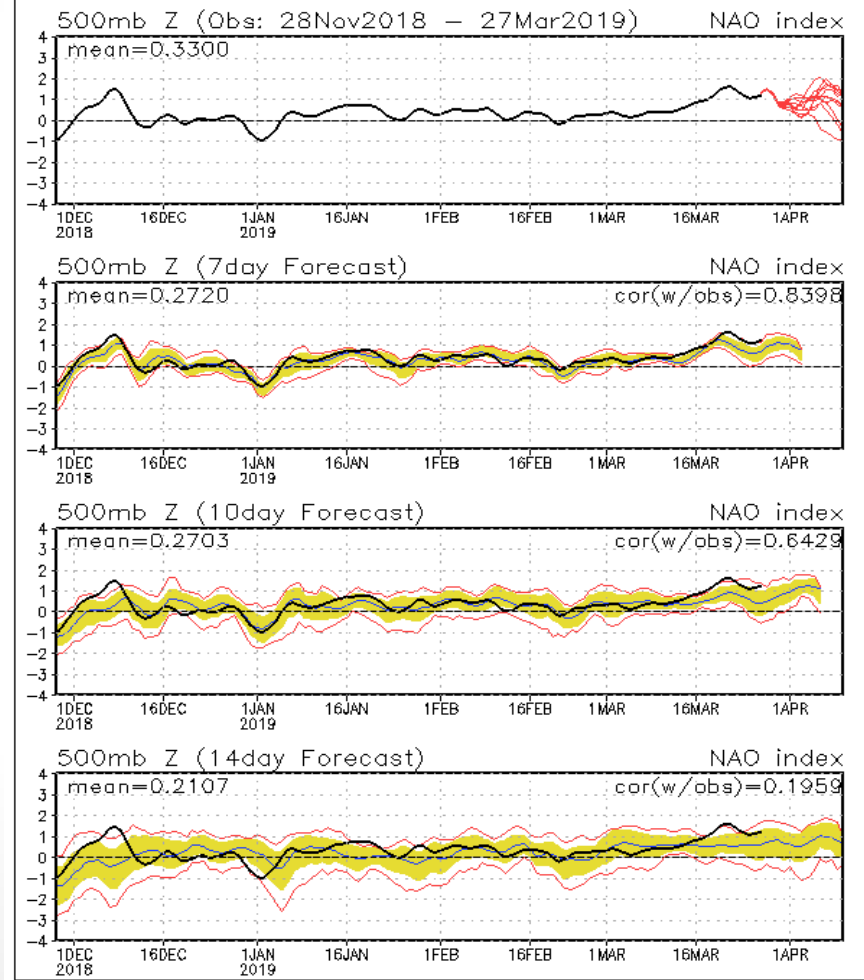
AO and NAO



AO: Observed & ENSM forecasts



NAO: Observed & ENSM forecasts



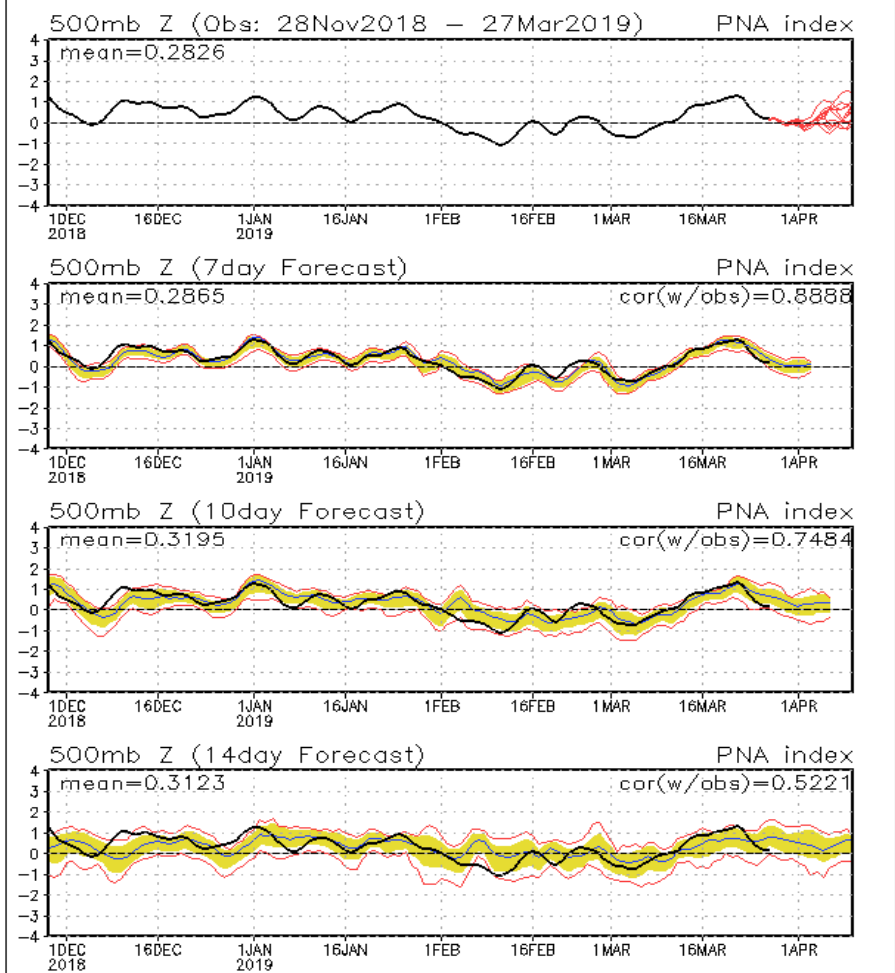


Teleconnection Patterns

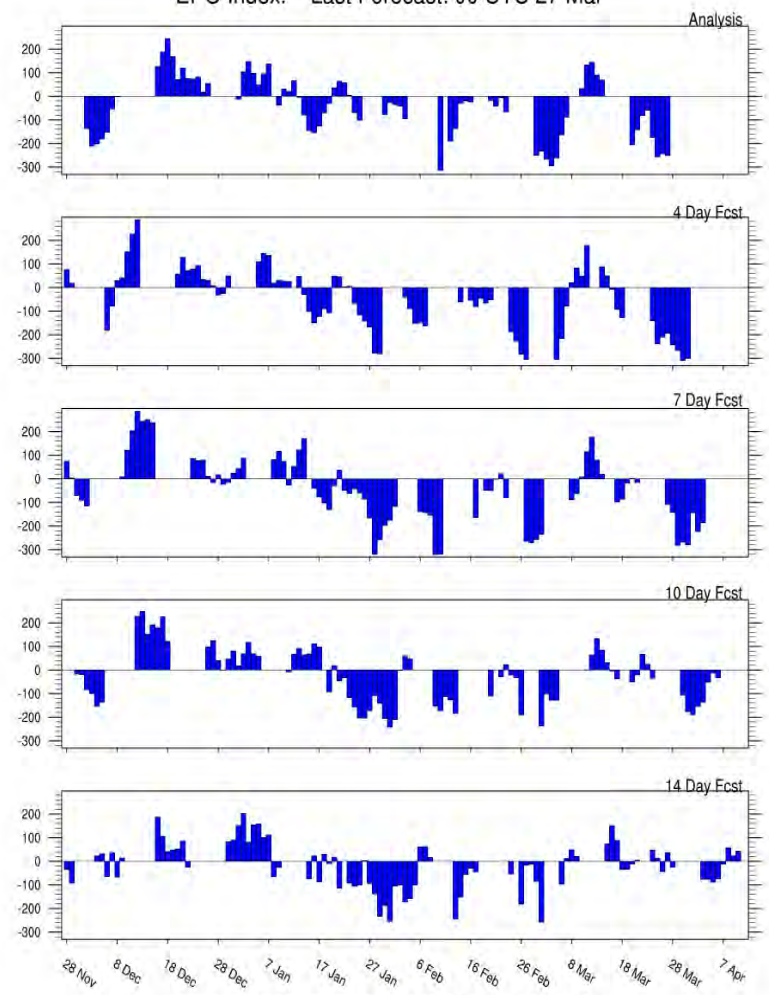
PNA – EPO



PNA: Observed & ENSM forecasts



EPO Index. Last Forecast: 00 UTC 27 Mar



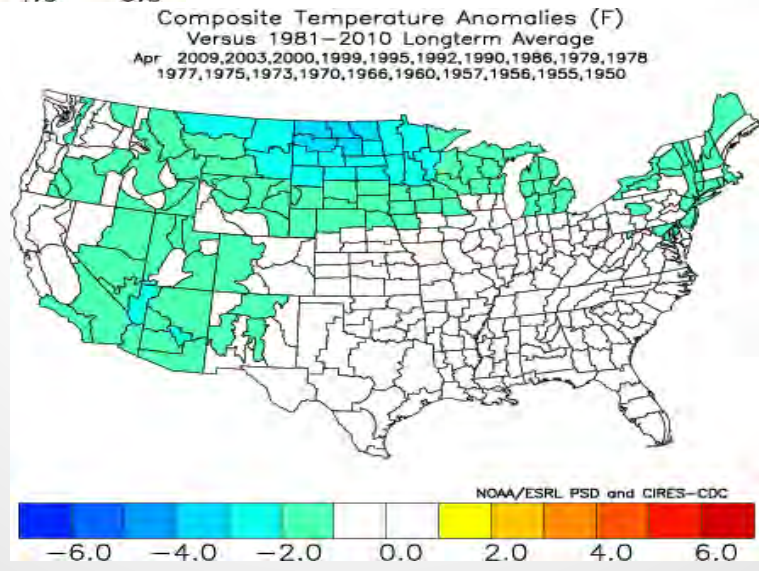
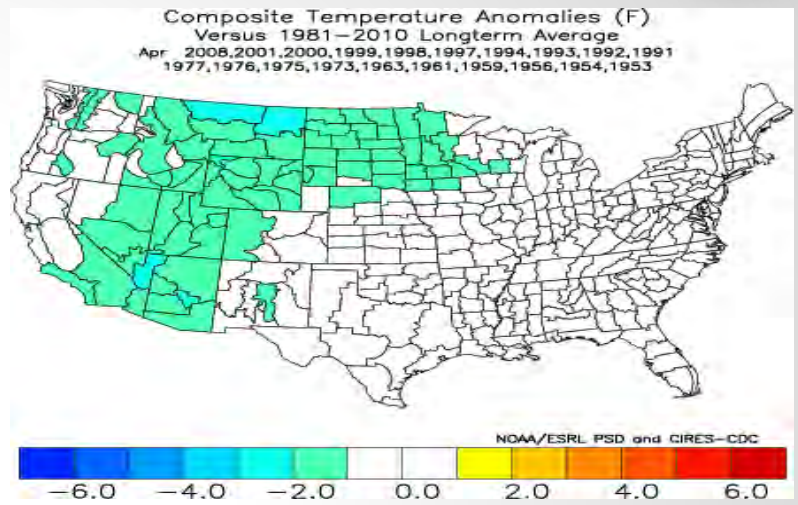
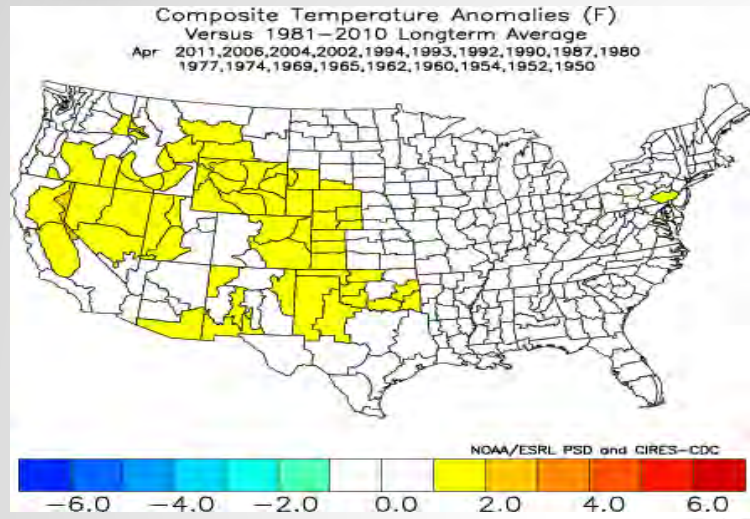
Based on NOAA/ESRL/PSD Reforecast2 Climatology, 1985-2012.





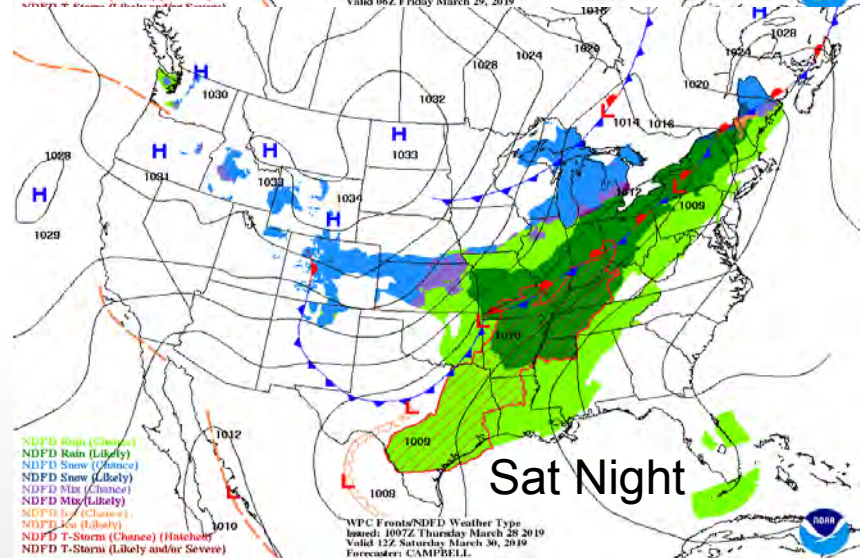
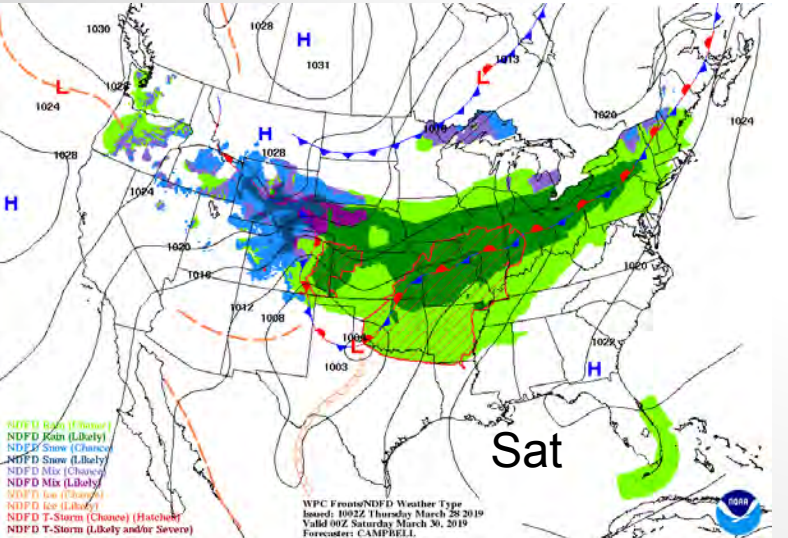
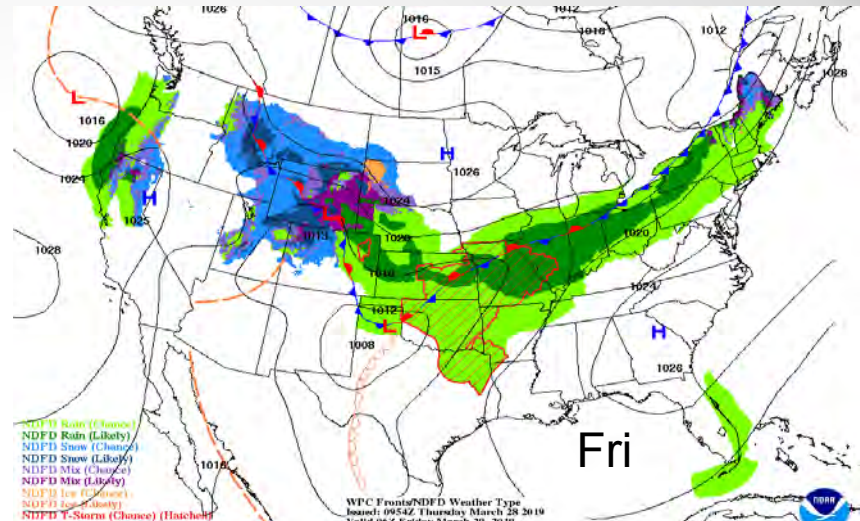
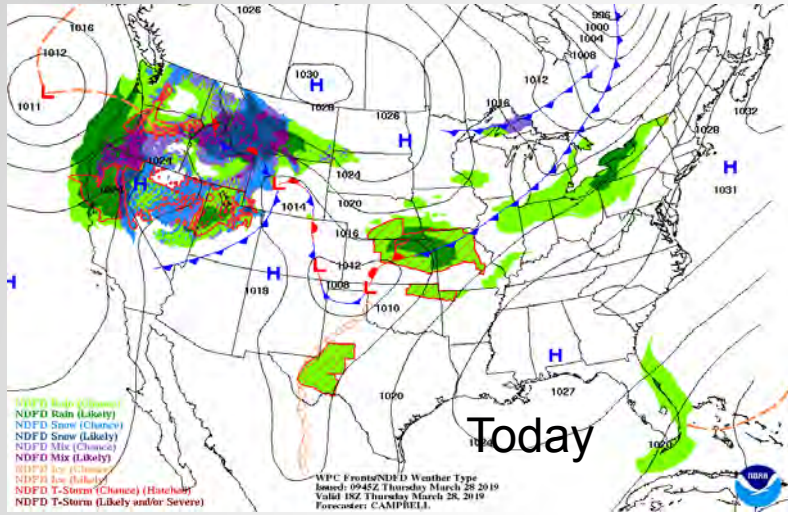
NAO – PNA - EPO

April Temperature Trends





Surface Maps





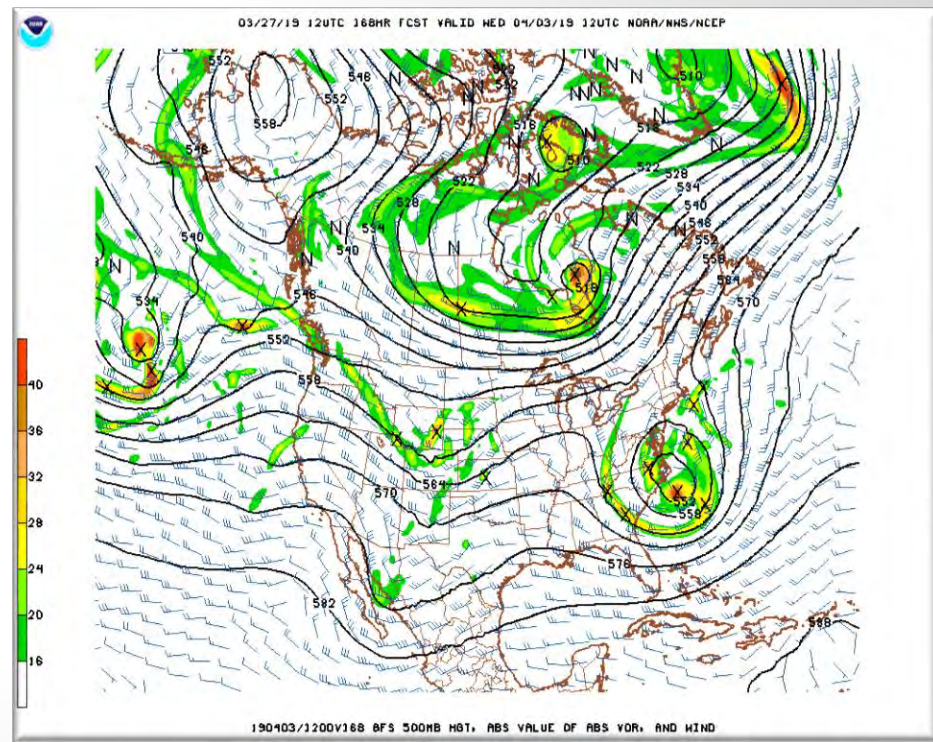
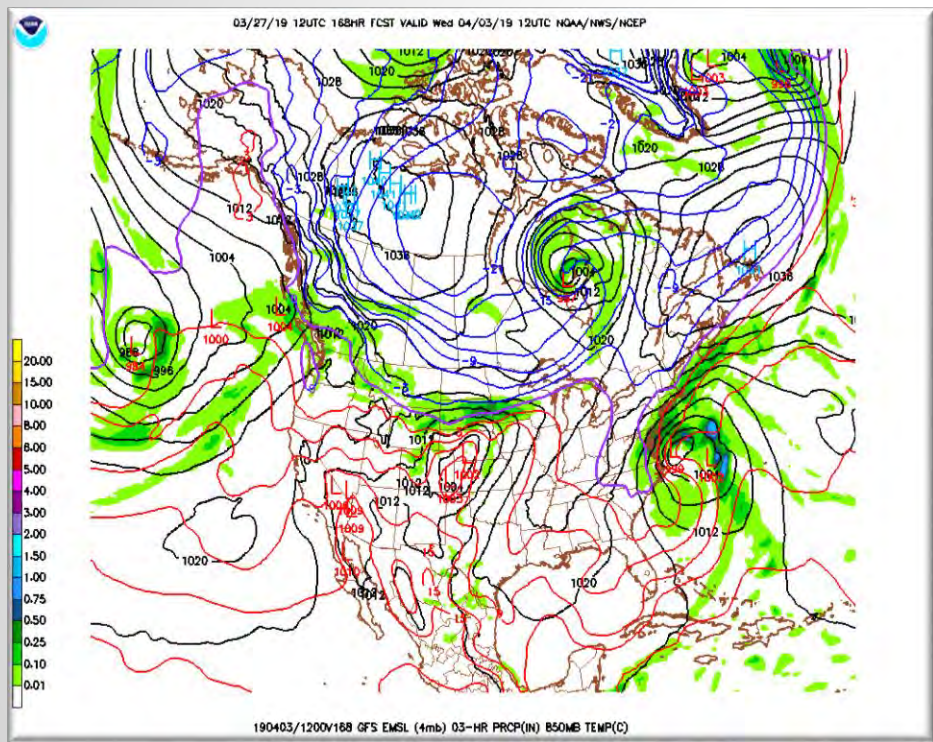
GFS Model

168 Hr



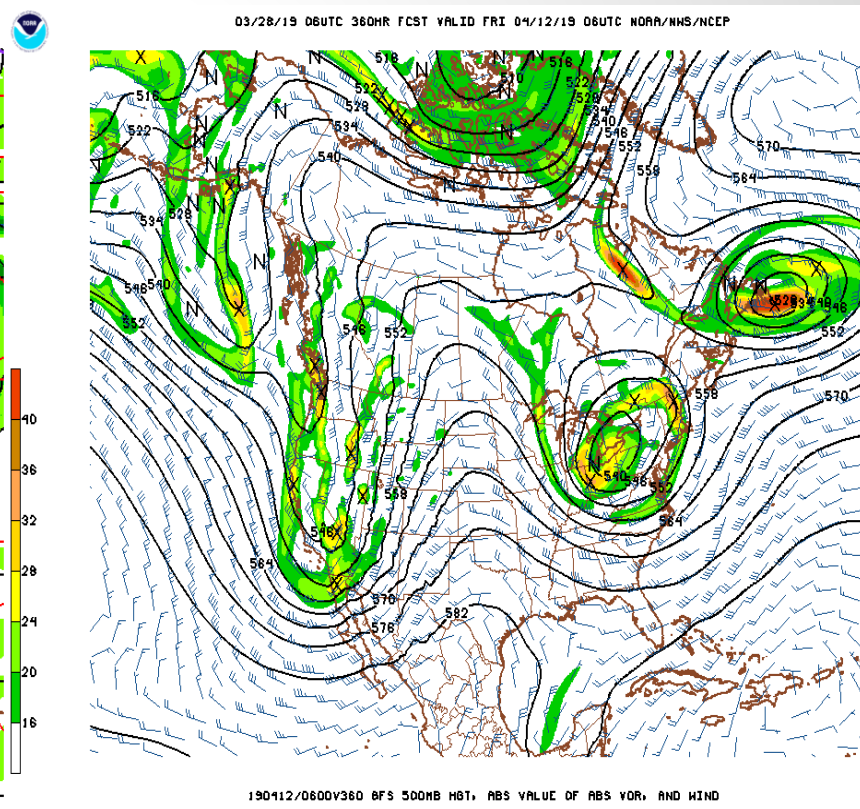
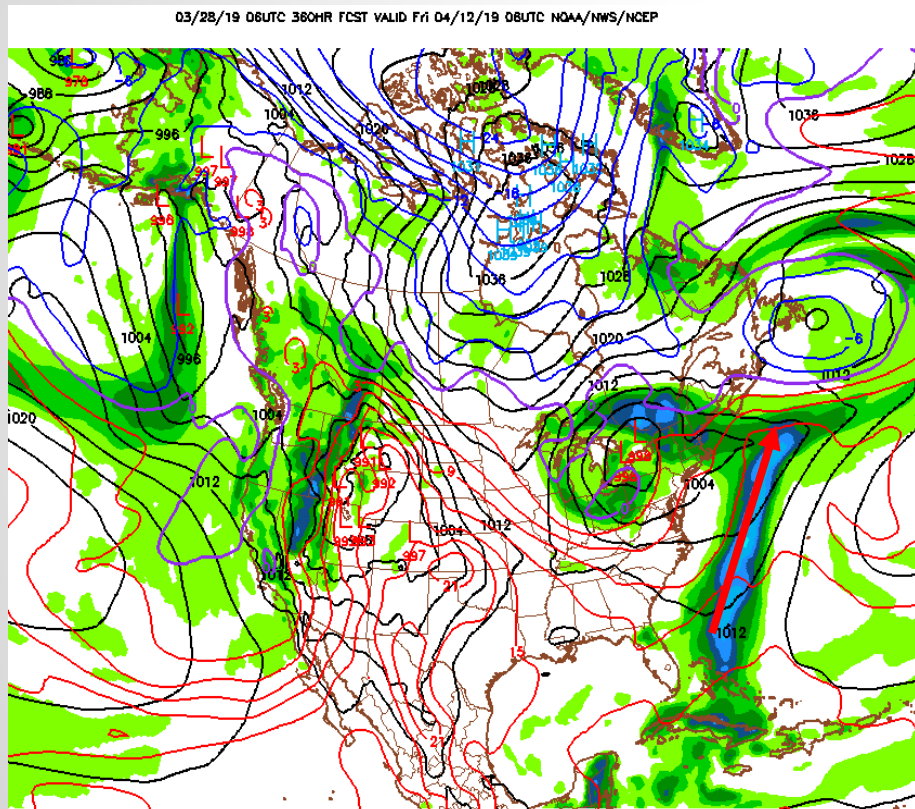
☐ Surface Analysis

500 Mb Analysis



☐ Surface Analysis

500 Mb Analysis





Flood Potential

Longer Term – Above Normal North








Spring Flood Potential Outlook

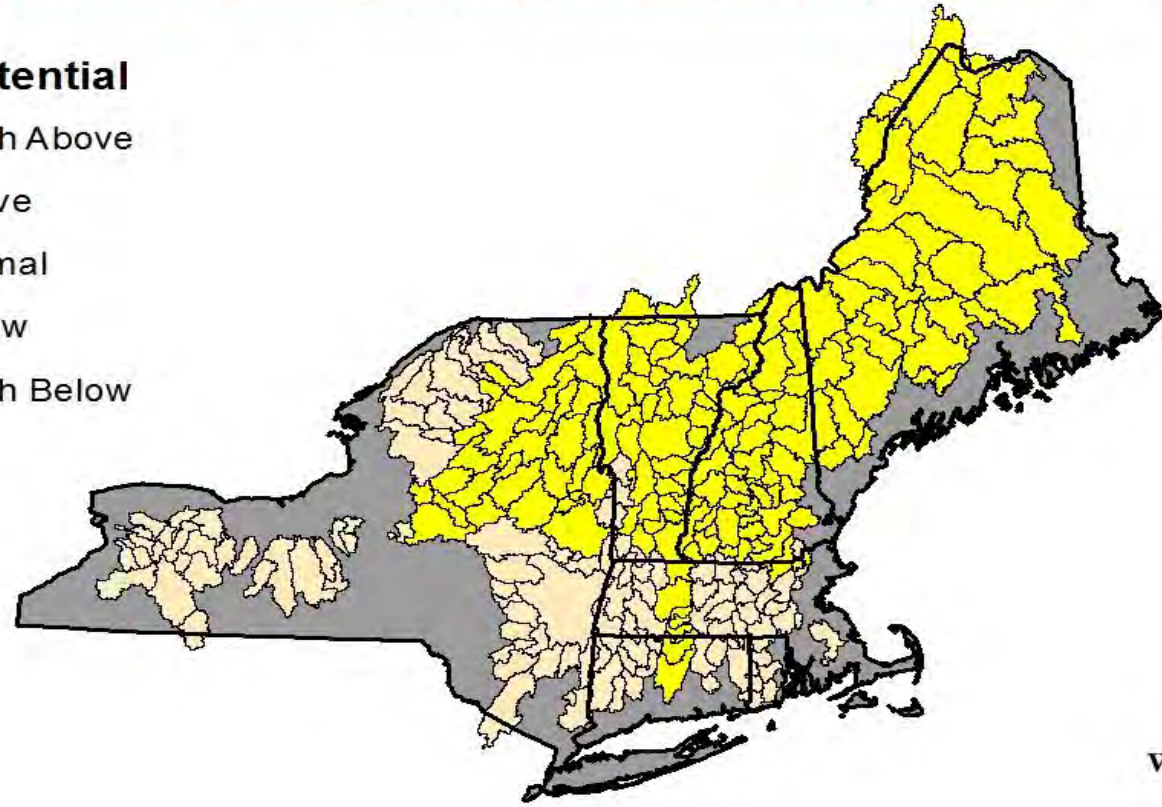
Outlook Issued 3/20/2019; Valid 3/20/2019 - 4/4/2019; updated biweekly

**** This product does not address the potential for flooding due to ice jams ****



Flood Potential

-  Much Above
-  Above
-  Normal
-  Below
-  Much Below

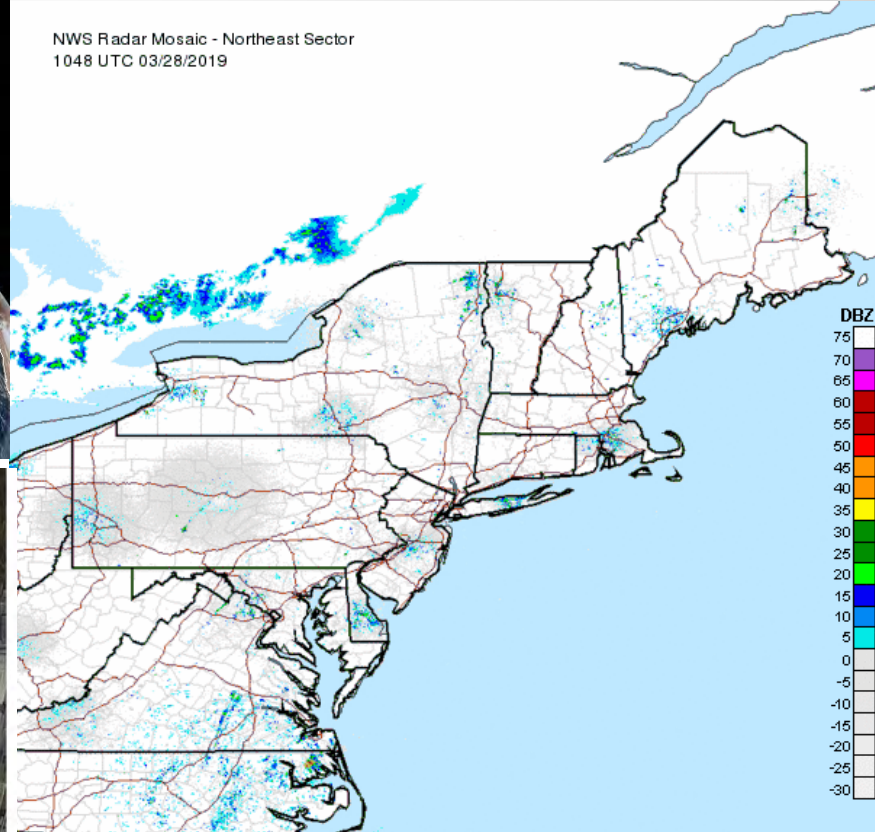


Map produced by the Northeast River Forecast Center





Northeast River Forecast Center's Next Scheduled Spring Outlook – Apr 5th 2019



Ed Capone
Service Coordination Hydrologist
NOAA/NWS/Northeast River Forecast Center



Building a Weather-Ready Nation