

Developing drought triggers and indicators using the National Water Model: A case study to improve the U.S. Drought Monitor in support of the Northeast DEWS

Arthur T. DeGaetano

Northeast Regional Climate Center

Craig R. Ferguson

Atmospheric Sciences Research Center University at Albany, Albany, NY

Charles N. Kroll

Department of Environmental Resources Engineering, SUNY-ESF,

Collaborator: Mark Svoboda Director, National Drought Mitigation Center

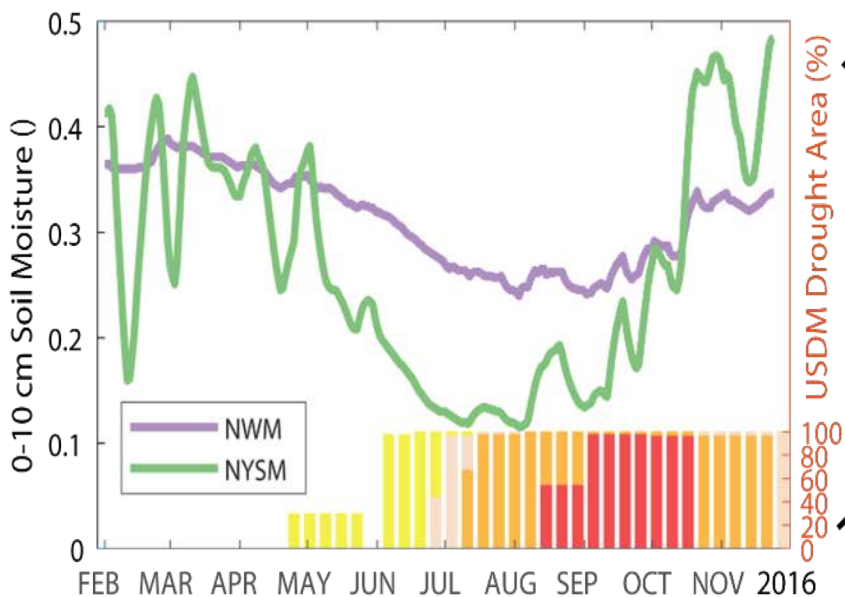


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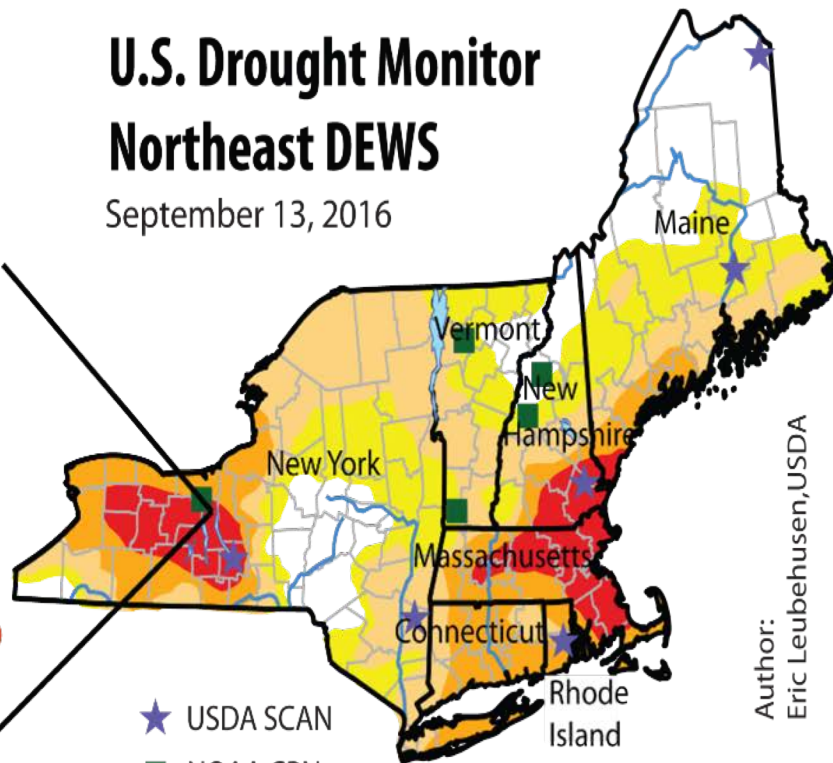
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Climate Center

Waterloo, NY (Seneca County)
February 1 - November 30, 2016



U.S. Drought Monitor Northeast DEWS

September 13, 2016



Author:
Eric Leubehusen, USDA

Intensity:



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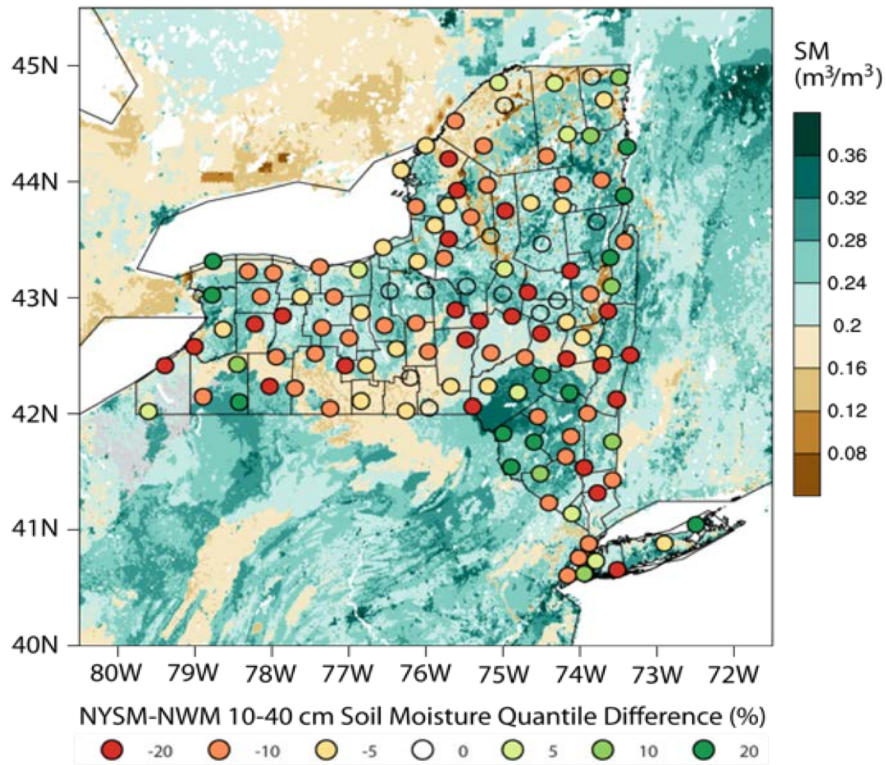


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Objectives

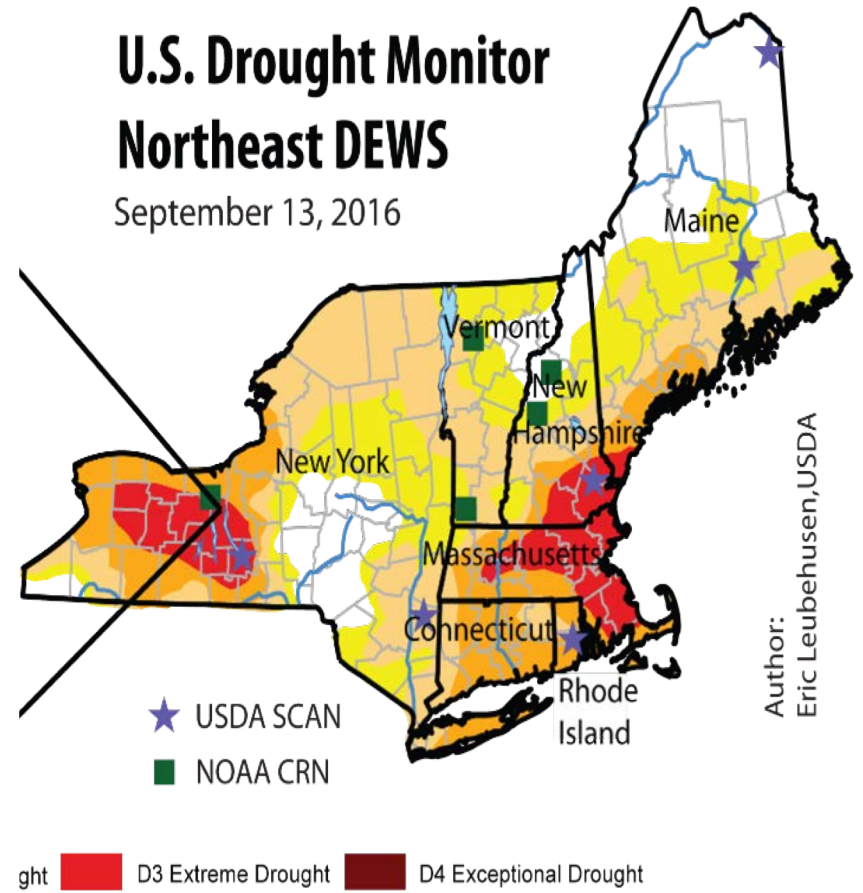
- Validate historical NWM simulations based on soil moisture observations from the NYS Mesonet (and other networks) and USGS streamflow data
- Evaluate whether changes in ground water storage can be inferred from NWM streamflow predictions;
- Conduct a NWM reforecast experiment focused on the 2016 drought;
- Develop a suite of NWM drought trigger and indicator products including DM blends;
- Engage DM authors to assess differences in drought depictions based on our newly developed products; and
- Integrate NYS Mesonet- and NWM-based indicators into the NE DEWS Dashboard.





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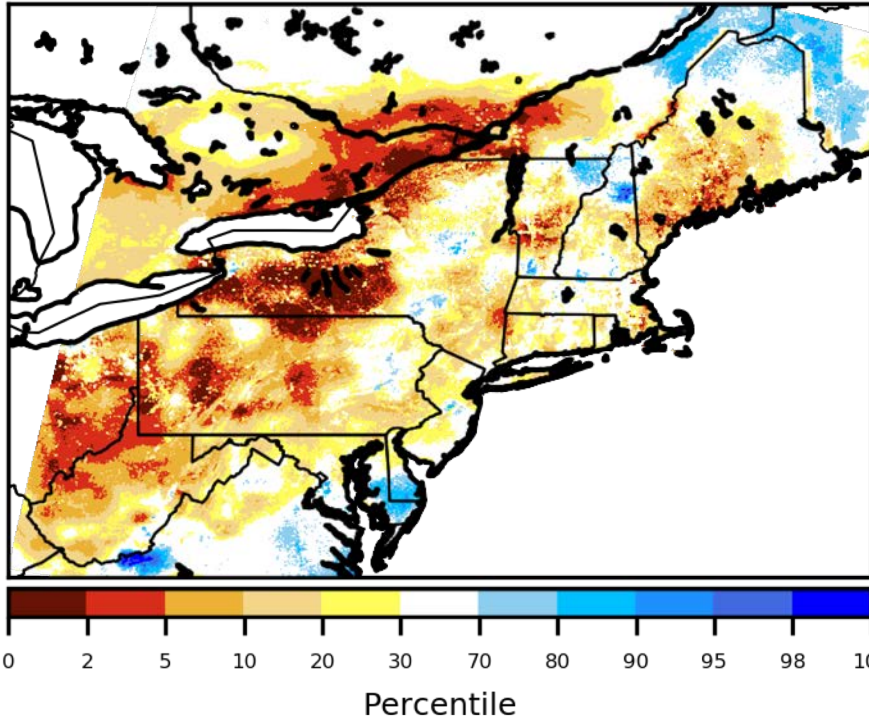


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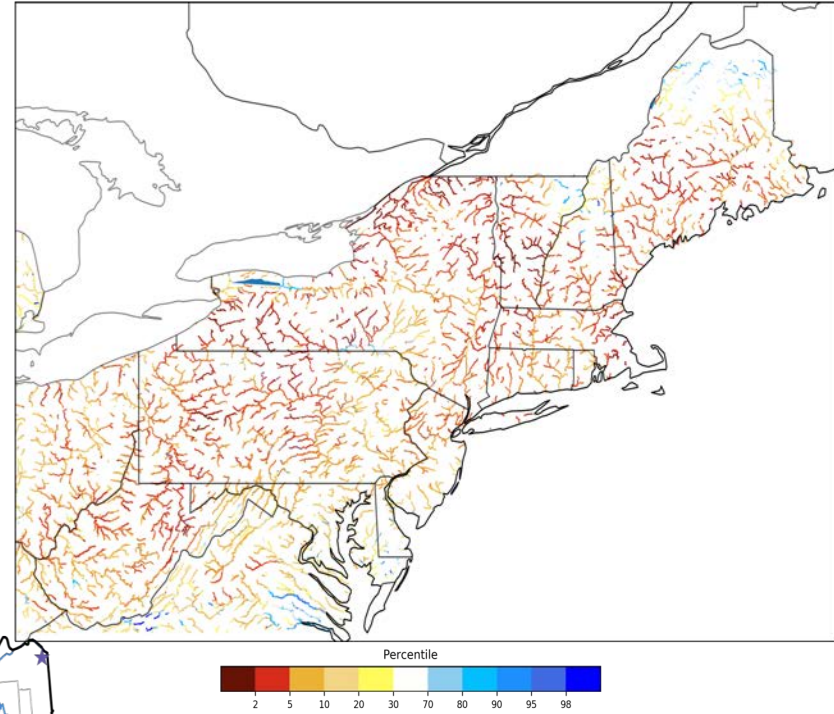


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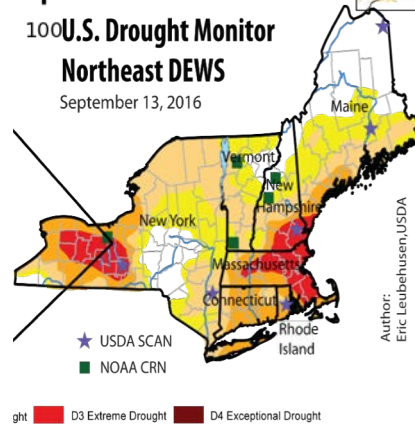
NWM Soil Moisture, 10-40cm, (wrt/ 1993-2018)



NWM Current Streamflow (wrt/ 1993-2018)



U.S. Drought Monitor
Northeast DEWS
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- Critical Success Index: Hits below 30th (D0-D4) and 10th (D2-D4) percentiles

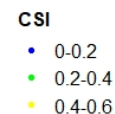
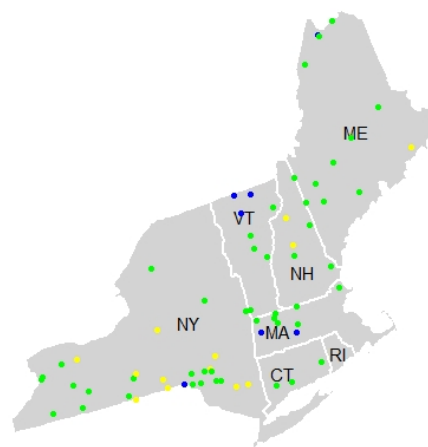
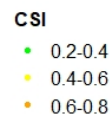
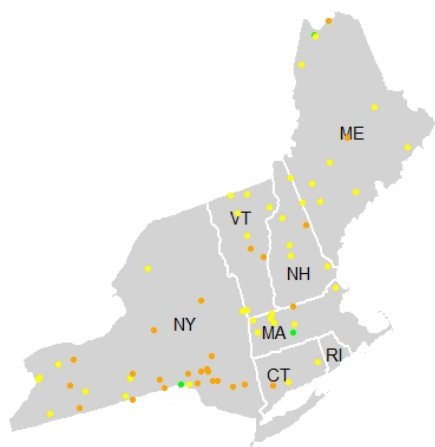
Observations

		Drought Observed	Drought not Observed	Total Drought Predicted
NWM	Drought Predicted	Hits	False Alarms	Predicted Drought
	Drought not Predicted	Misses	Correct no Prediction	Predicted no Drought
	Total Droughts Observed	Observed Drought	Observed no Drought	Total

$$CSI = \frac{Hits}{Hits + Misses + False\ Alarms}$$

CSI at 30th percentile of Streamflow in NE

CSI at 10th percentile of Streamflow in NE



Results:

+ bias NWM > obs; good correlation

CSI better at higher drought threshold (30th vs. 10th percentiles)

Rate of drought prediction varies widely across Northeast



Results:

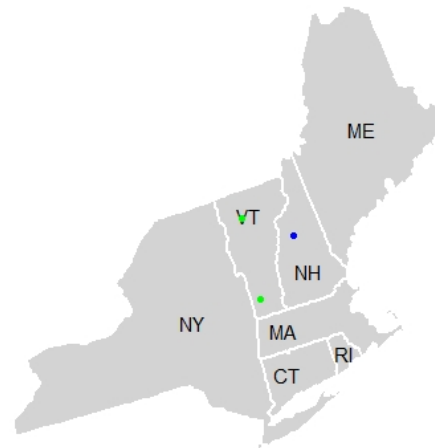
Only CRN and SCAN sites employed (longer records)

Slight + bias NWM>obs; weaker correlation than streamflow

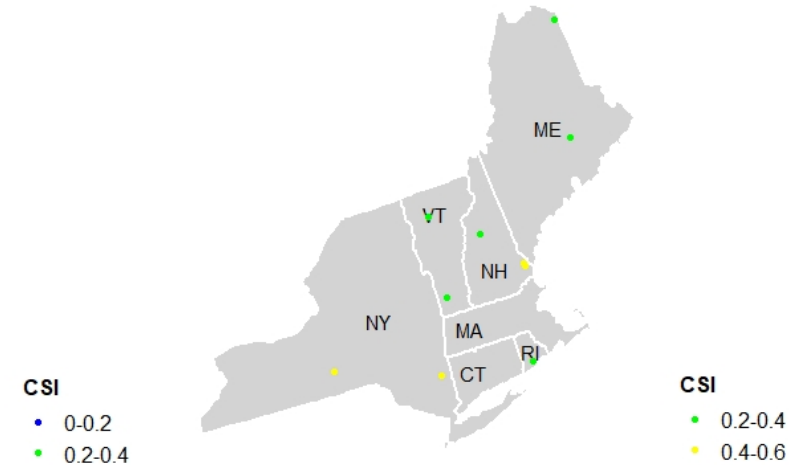
CSI generally low (0 – 0.4) varies widely across sites

Generally poorer performance compared to streamflow results

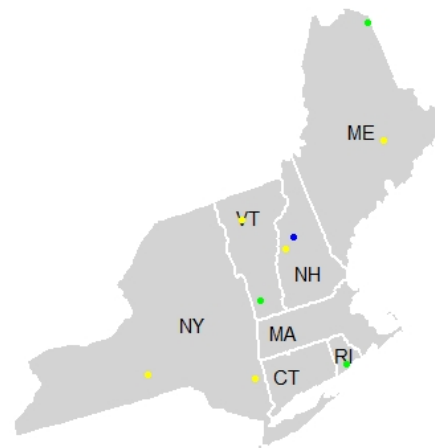
CSI at 30th percentile of SM1 in NE



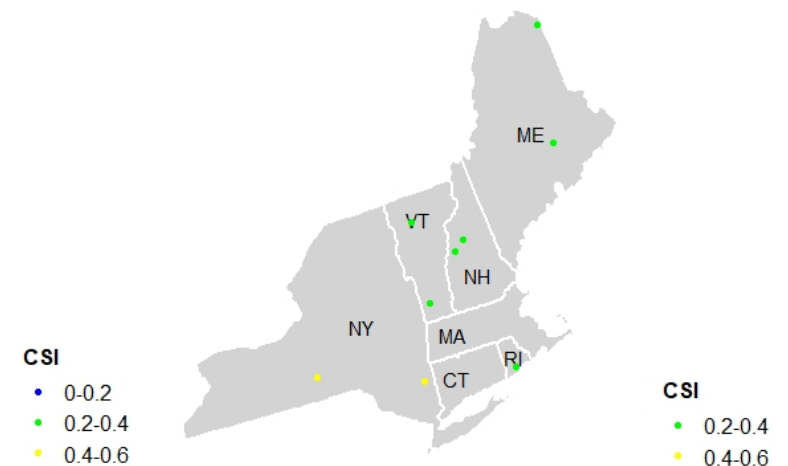
CSI at 30th percentile of SM2 in NE



CSI at 30th percentile of SM3 in NE



CSI at 30th percentile of SM4 in NE



USDM Author Case Study Assessments

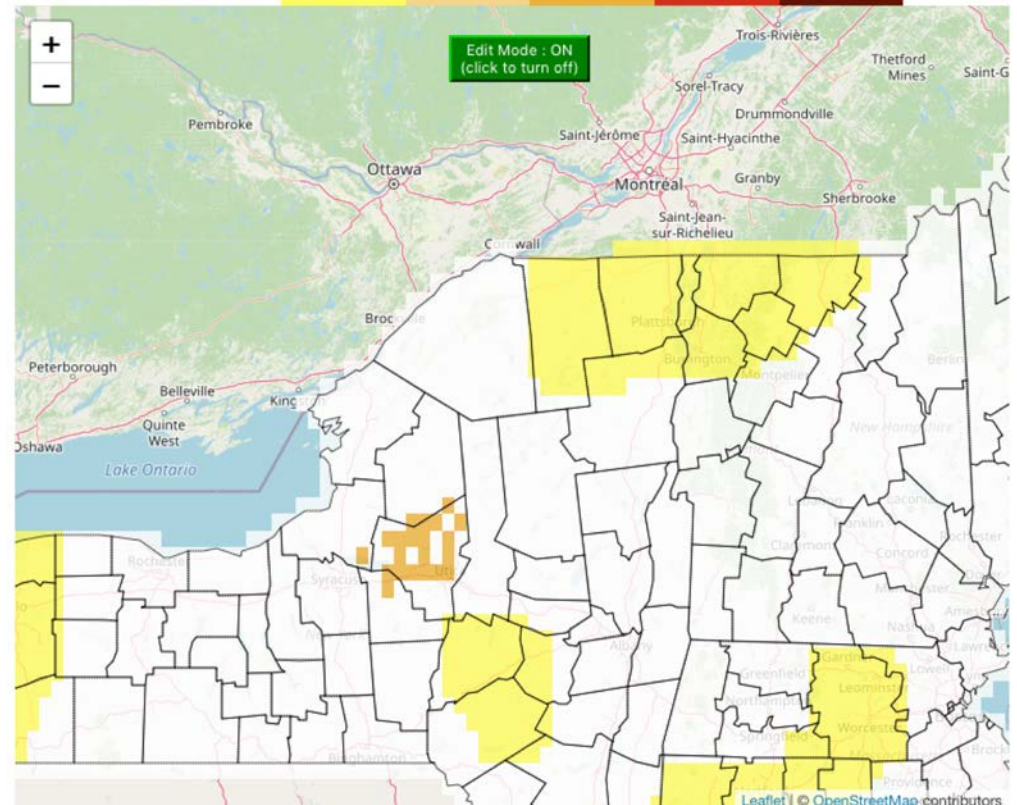
Author: SDSDD [LOGOUT](#)

Analysis for: Case C [CHANGE](#)

Recording your analysis for **Case C** :

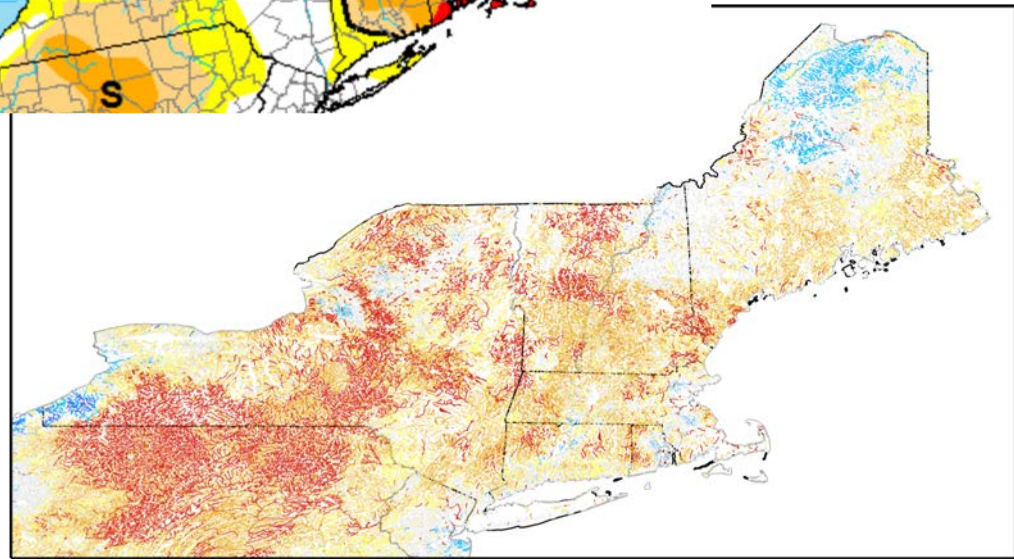
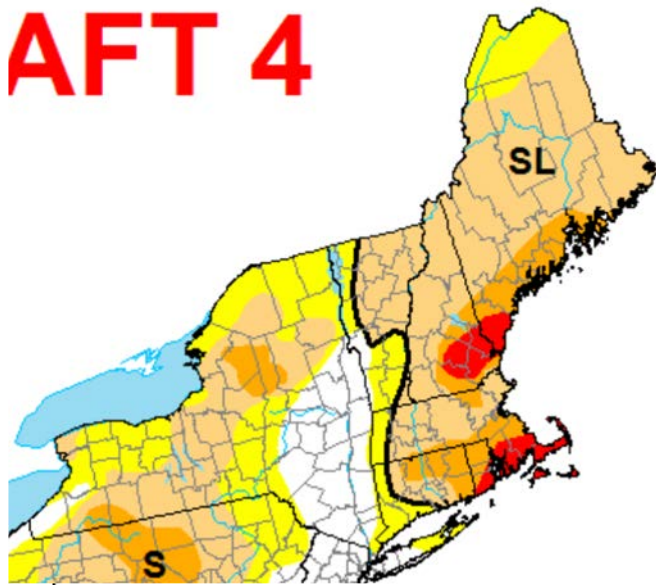
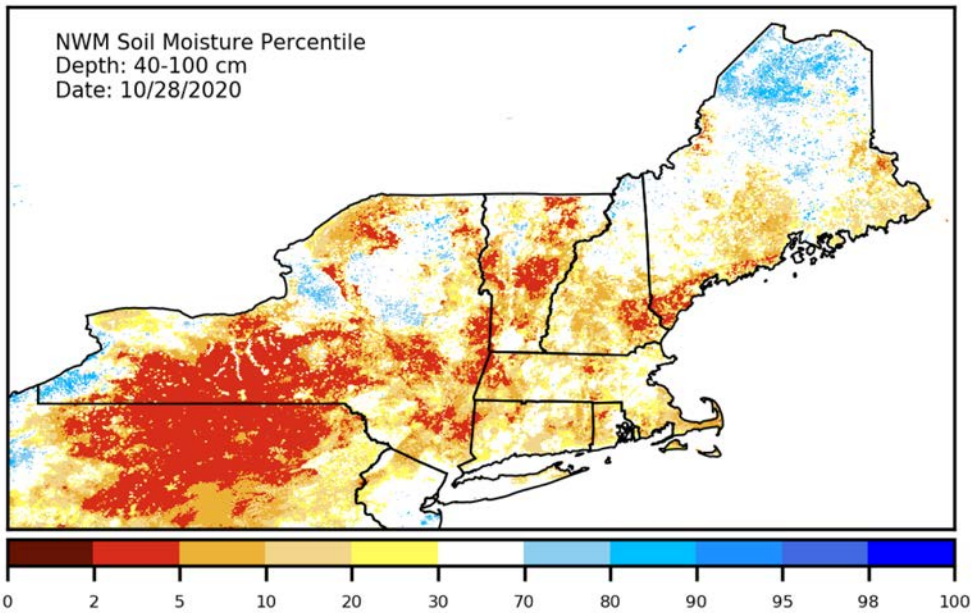
- 1) Pan and zoom to the map area you would like to edit.
- 2) Turn 'Edit Mode' to ON and select a drought category you would like to assign to the map.
- 3) Hold your mouse button down while dragging the cursor to assign the selected category to the map.
- 4) Turn 'Edit Mode' back OFF to pan/zoom to a new area, repeating the steps until complete.
- 5) Click Save to finish your analysis later, or click Submit if you have completed this case.

None D0 D1 D2 D3 D4



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AFT 4



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