New York State Mesonet-based Fire Danger Rating System

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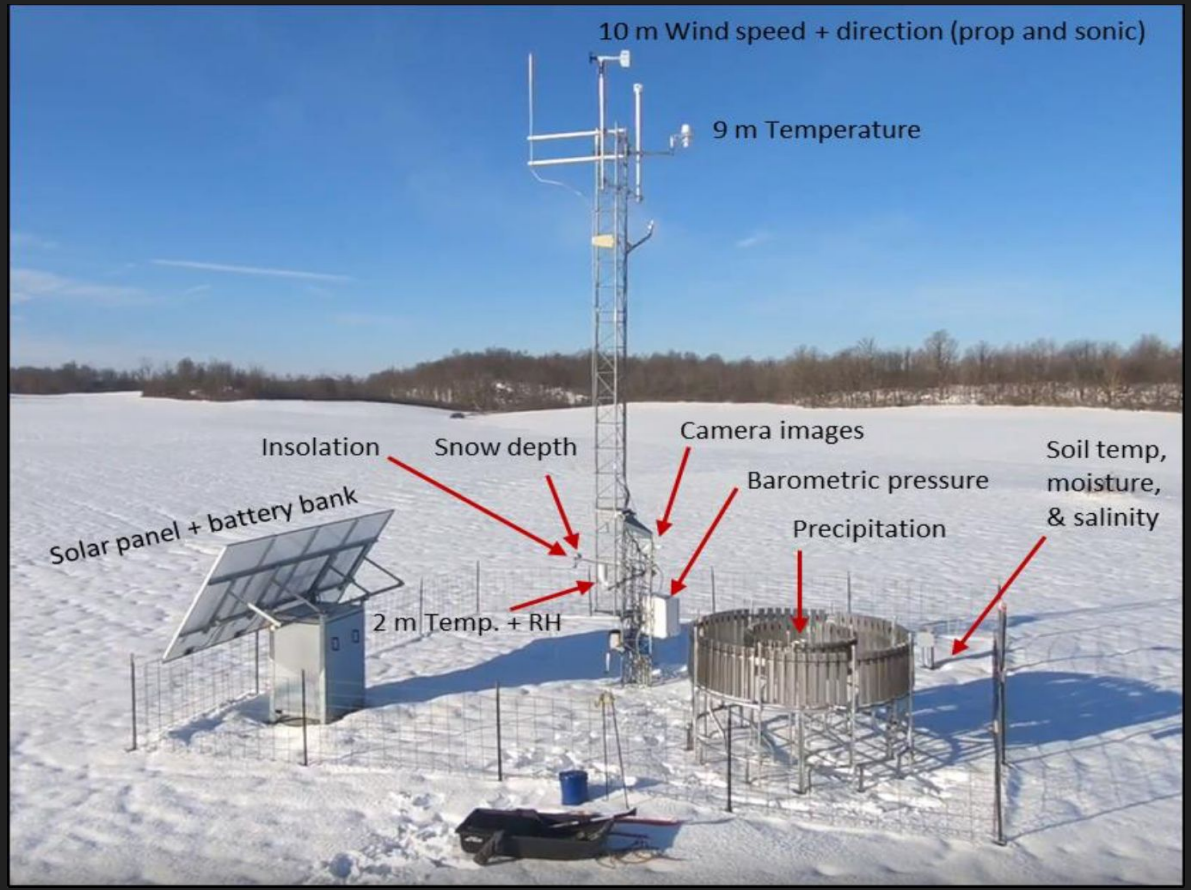
NYS Mesonet Standard Network of 127 Stations

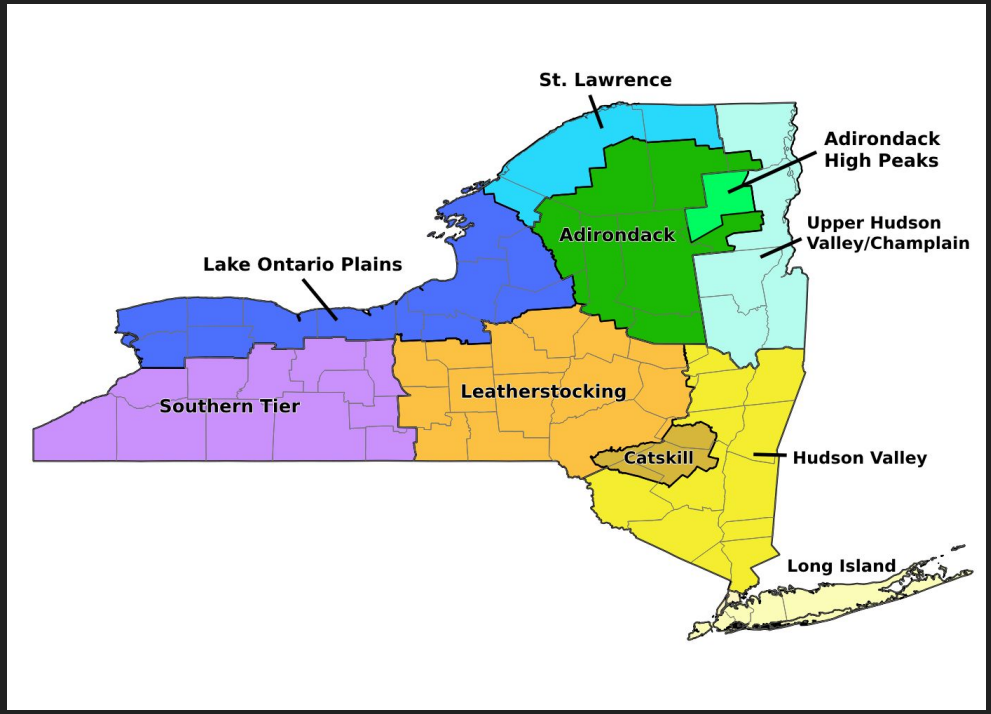


Project Overview

1. Replace DEC Division of Forest Protection 12 RAWS stations using Mesonet stations
2. Ingest Mesonet data into Weather Information Management System (WIMS)
3. Build an internal tool for DEC to create fire danger risk map for NY State
4. NYSM to host a public Fire Weather website

Fire Danger Rating Area (FDRA)

- Geographic area where fire danger is considered uniform
- Based on fire danger influences rather than political boundaries

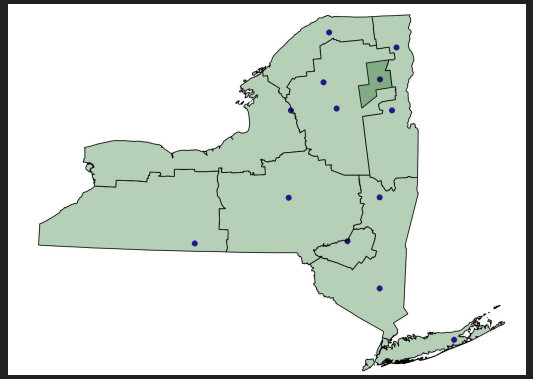


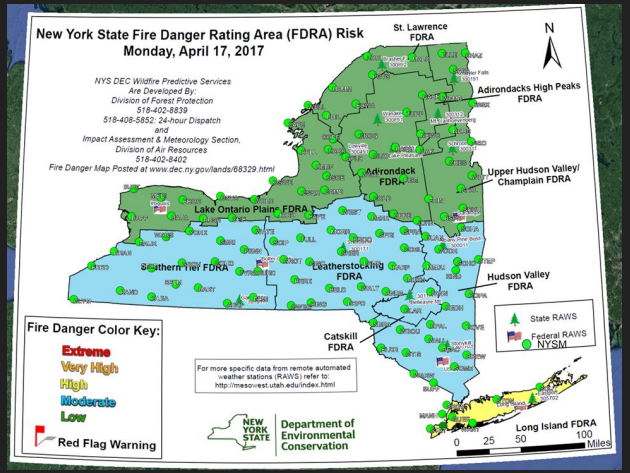
National Fire Danger Rating System (NFDRS)

- Estimates the fire danger for a given area taking into account weather, topography, and fuels
- Consists of 5 risk levels (Low, Moderate, High, Very High, and Extreme)
- Used for environmental decision making purposes

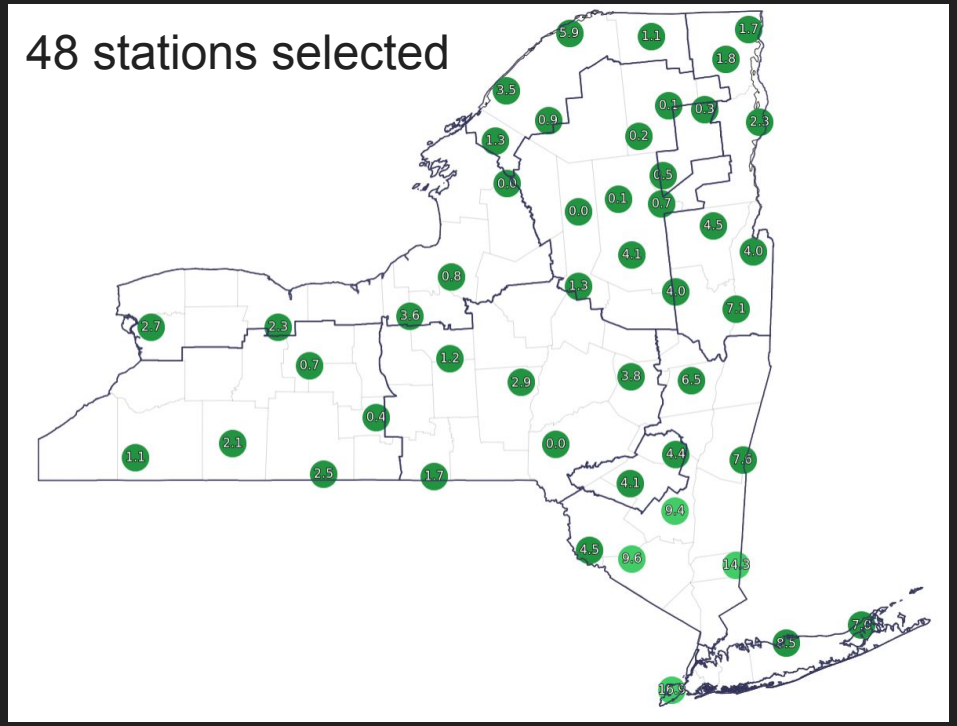
Remote Automated Weather Stations (RAWS)

- 12 stations maintained by DEC across NY state
- 1 or 2 stations per FDRA
- Gather weather and fuels information
- Help inform fire management strategies and public safety warnings

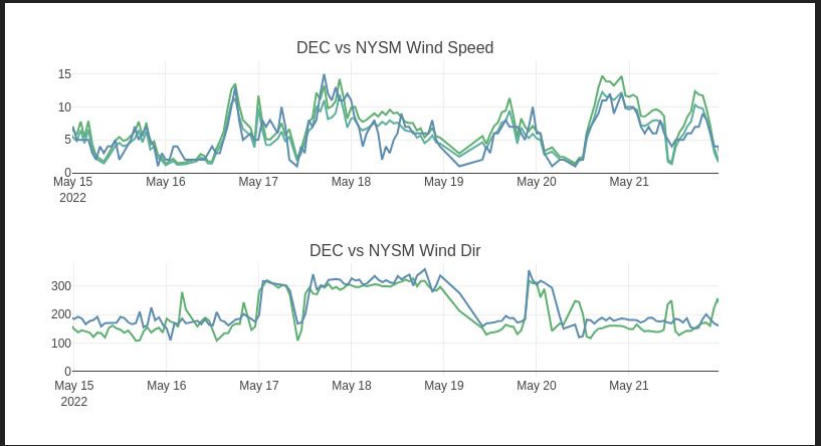




Selected NYSM Stations to replace RAWS



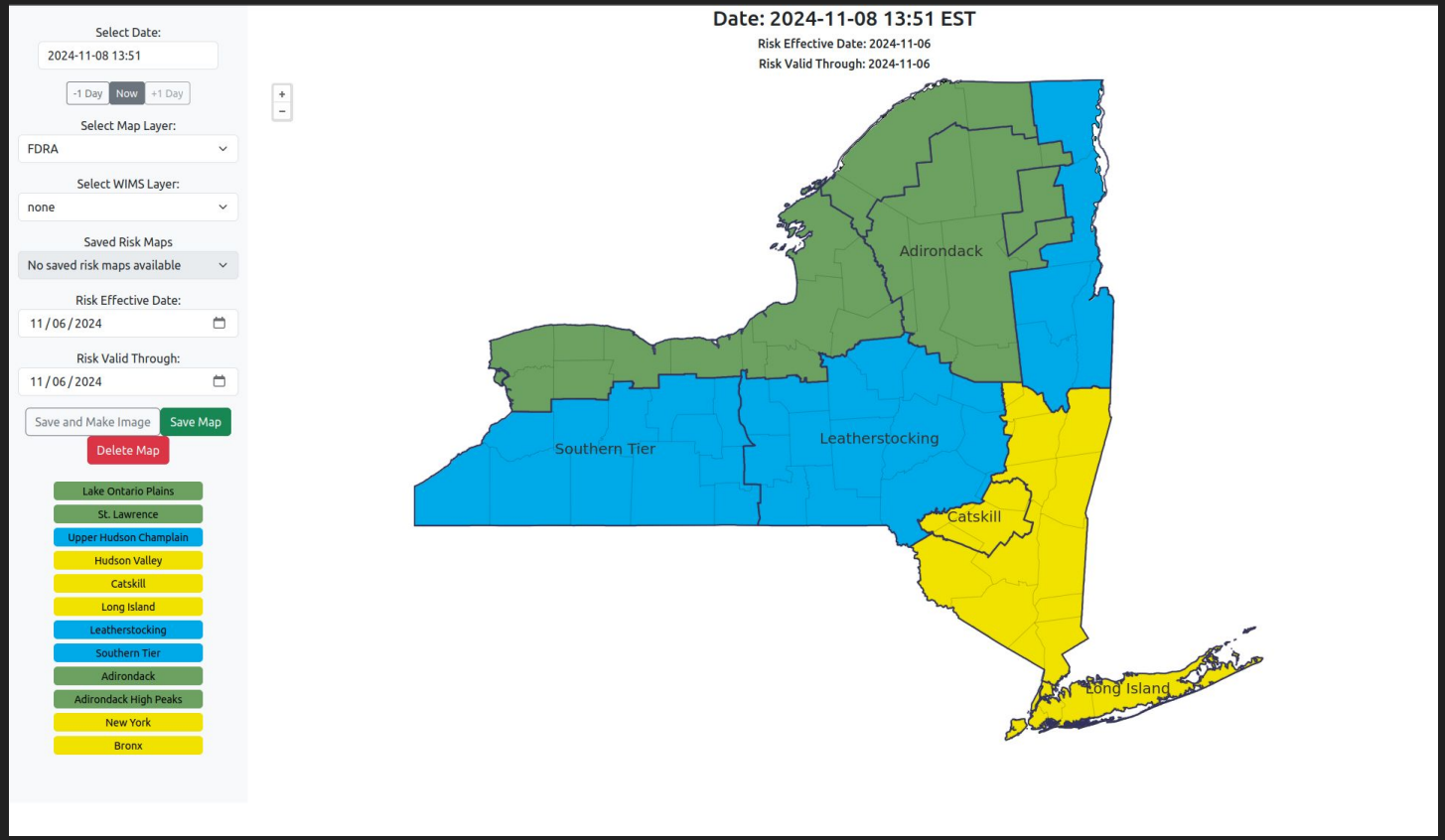
Example: VOOR vs Pine Bush



Weather Information Management System (WIMS)

- NYSM data is collected every 5 minutes
- Data is processed every hour and ingested into WIMS
- WIMS uses Nelson Model to calculate dead fuel moisture from atmospheric variables (temp, relh, srad, wind, precip)
- WIMS calculates NFDRS indices 1x daily
- NFDRS is downloaded 1x daily and archived internally

Internal Tool for DEC Meteorologists



Select Date:

2024-11-06 14:49

-1 Day | Now | +1 Day

Select Map Layer:

Relative Humidity

Select WIMS Layer:

none

Saved Risk Maps

2024-11-06 - 2024-11-06

Risk Effective Date:

11 / 06 / 2024

Risk Valid Through:

11 / 06 / 2024

Save and Make Image | Save Map

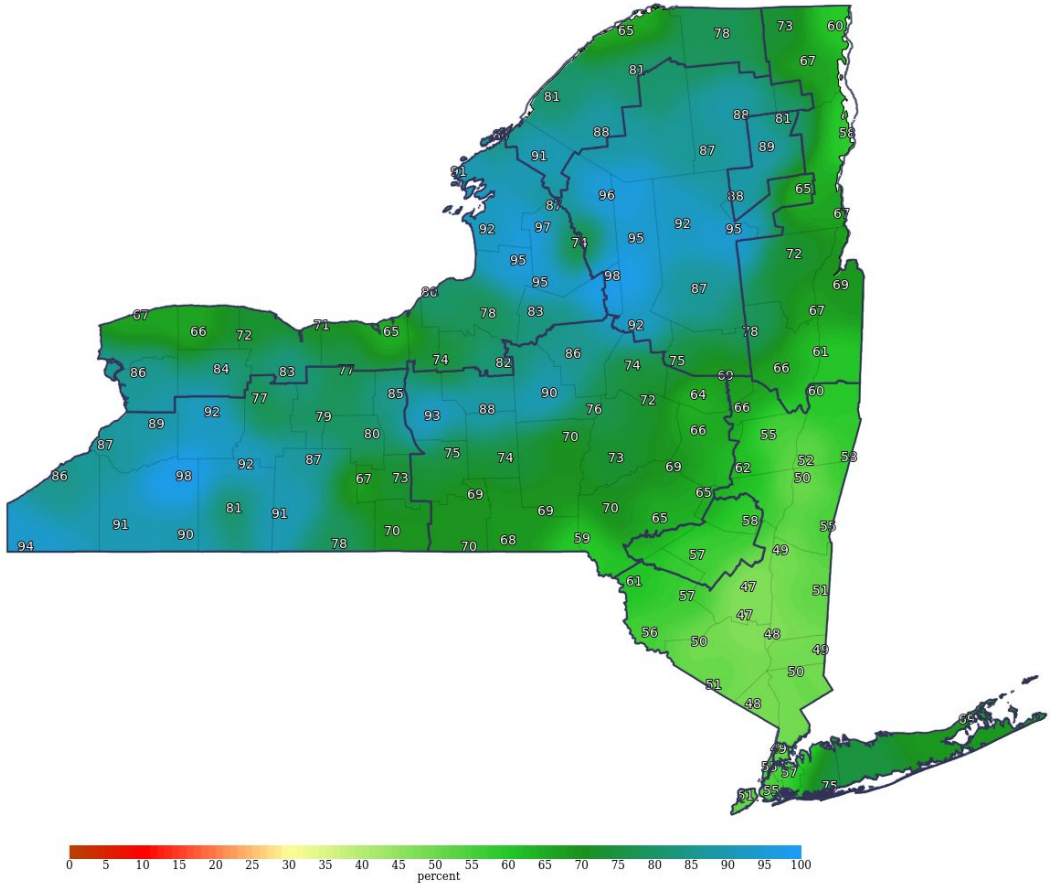
Delete Map

- St. Lawrence
- Catskill
- Southern Tier
- New York
- Lake Ontario Plains
- Hudson Valley
- Leatherstocking
- Adirondack High Peaks
- Upper Hudson Champlain
- Long Island
- Adirondack
- Bronx

Date: 2024-11-06 14:49 EST

Risk Effective Date: 2024-11-06

Risk Valid Through: 2024-11-06



Select Date:

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Select Map Layer:

FDRA

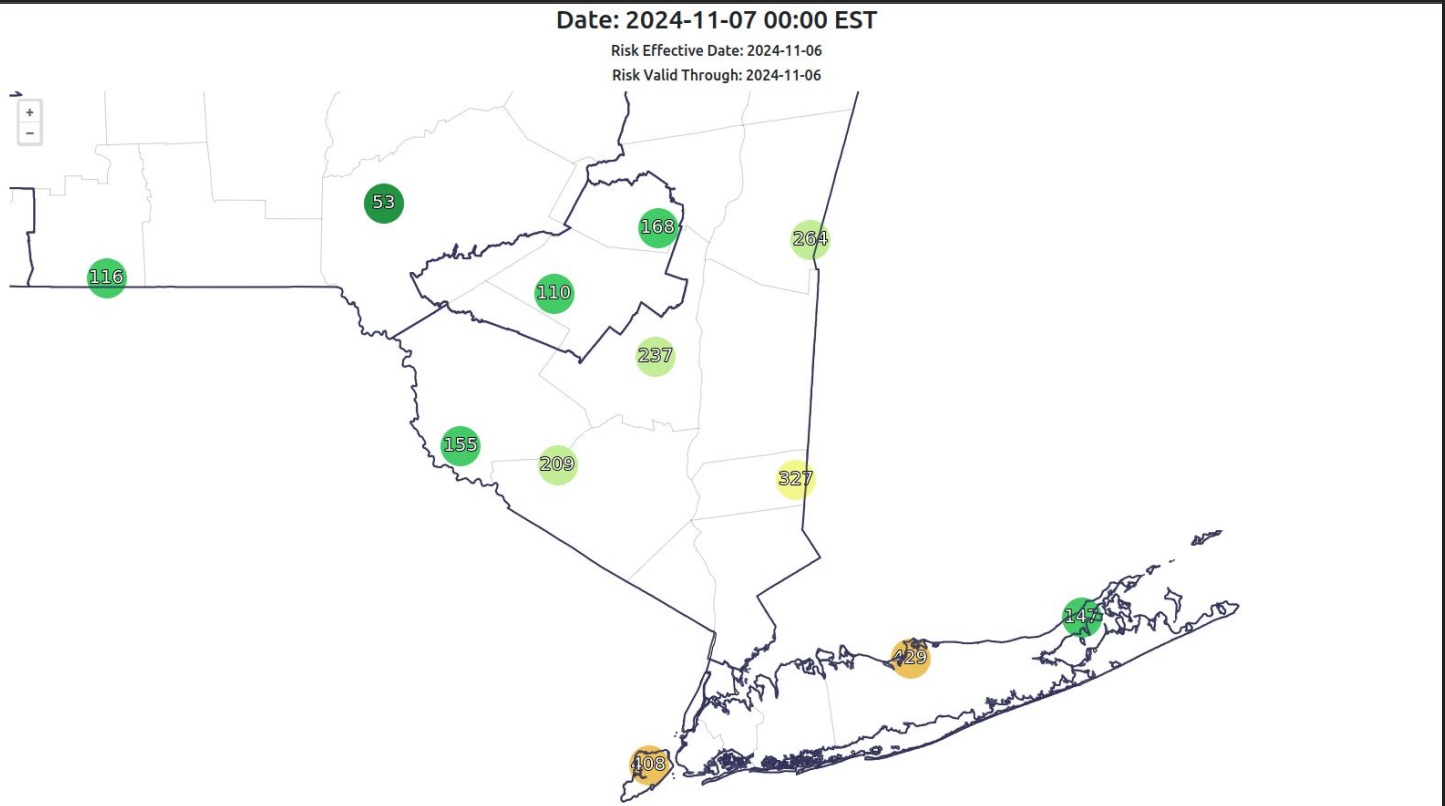
Select WIMS Layer:

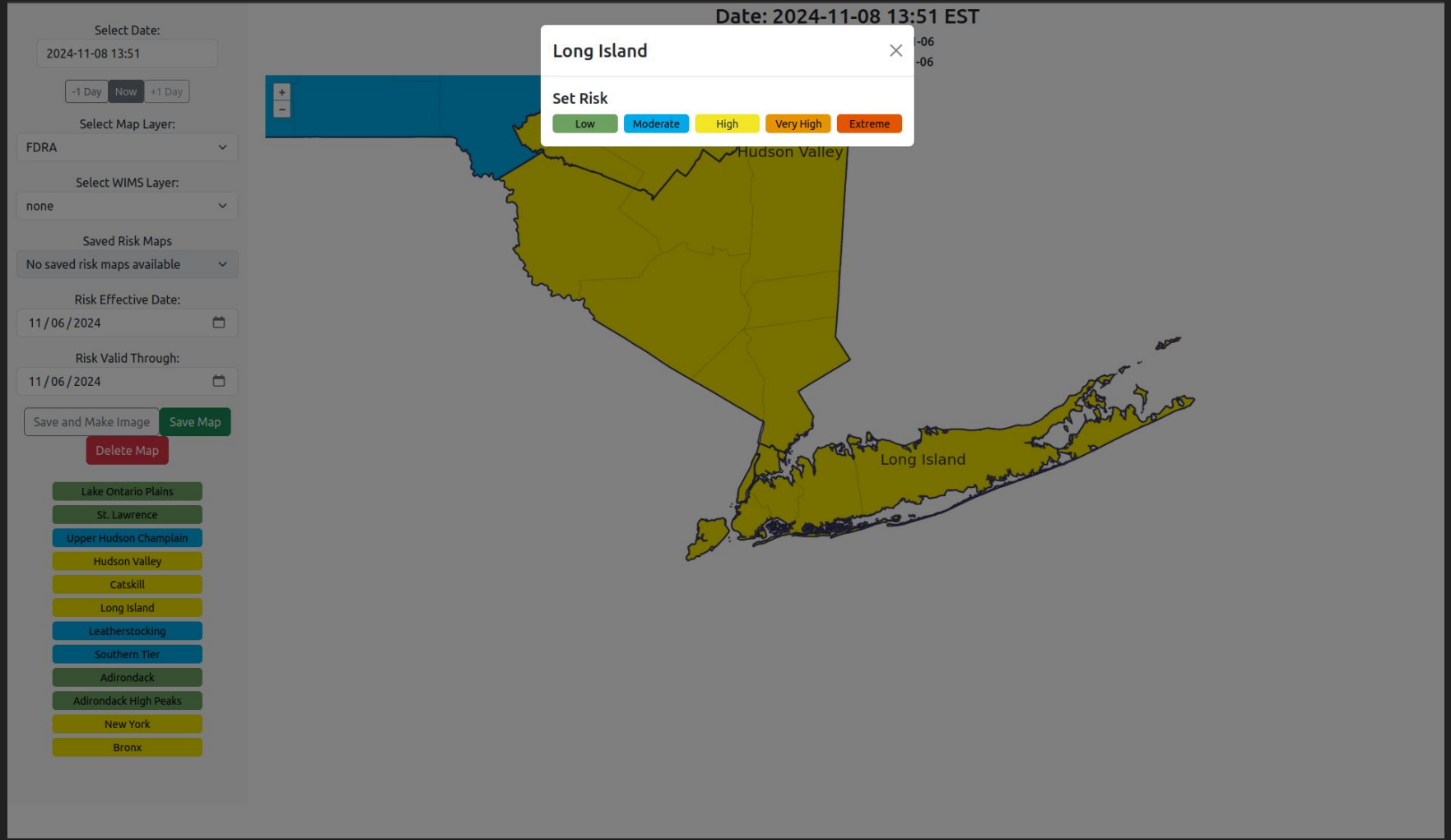
KBDI

- none
- KBDI
- Ignition Component
- Spread Component
- Energy Release Component
- Burning Index
- Fire Load
- 10hr Fuel Moisture
- 100hr Fuel Moisture
- 1000hr Fuel Moisture

Delete Map

- Lake Ontario Plains
- St. Lawrence
- Upper Hudson Champlain
- Hudson Valley
- Catskill
- Long Island
- Leatherstocking
- Southern Tier
- Adirondack
- Adirondack High Peaks
- New York
- Bronx

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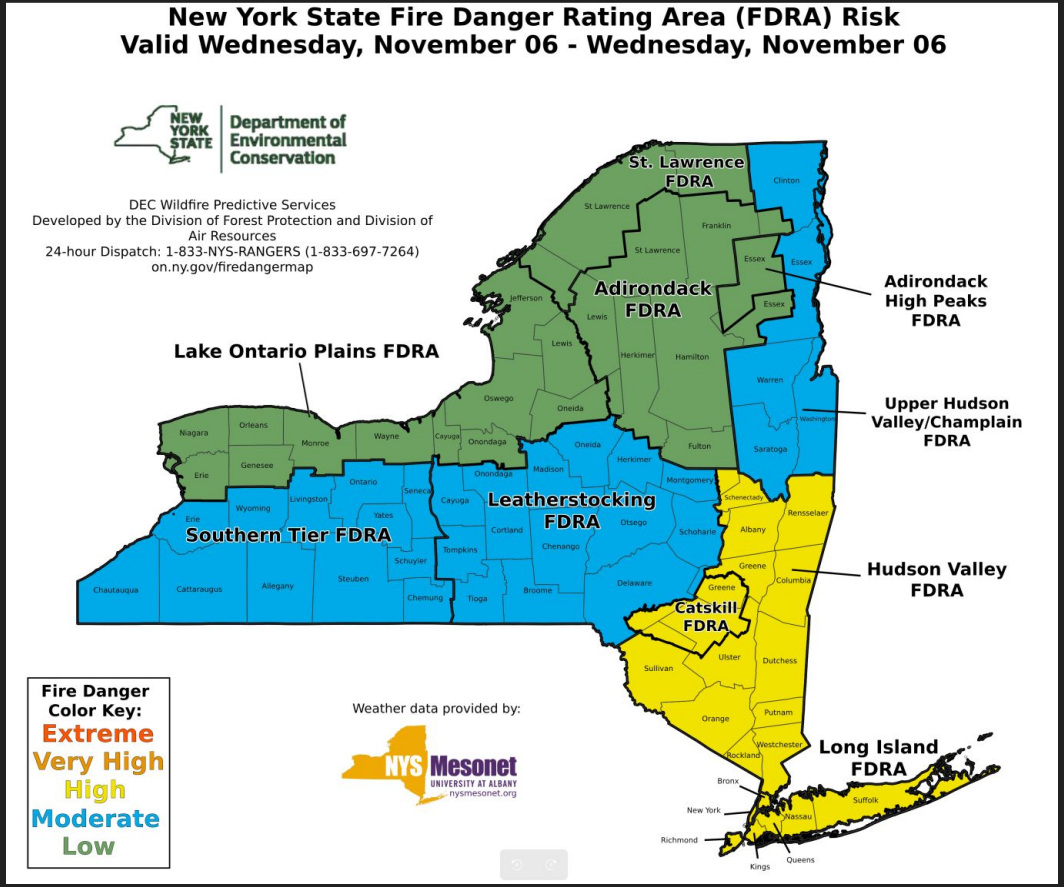
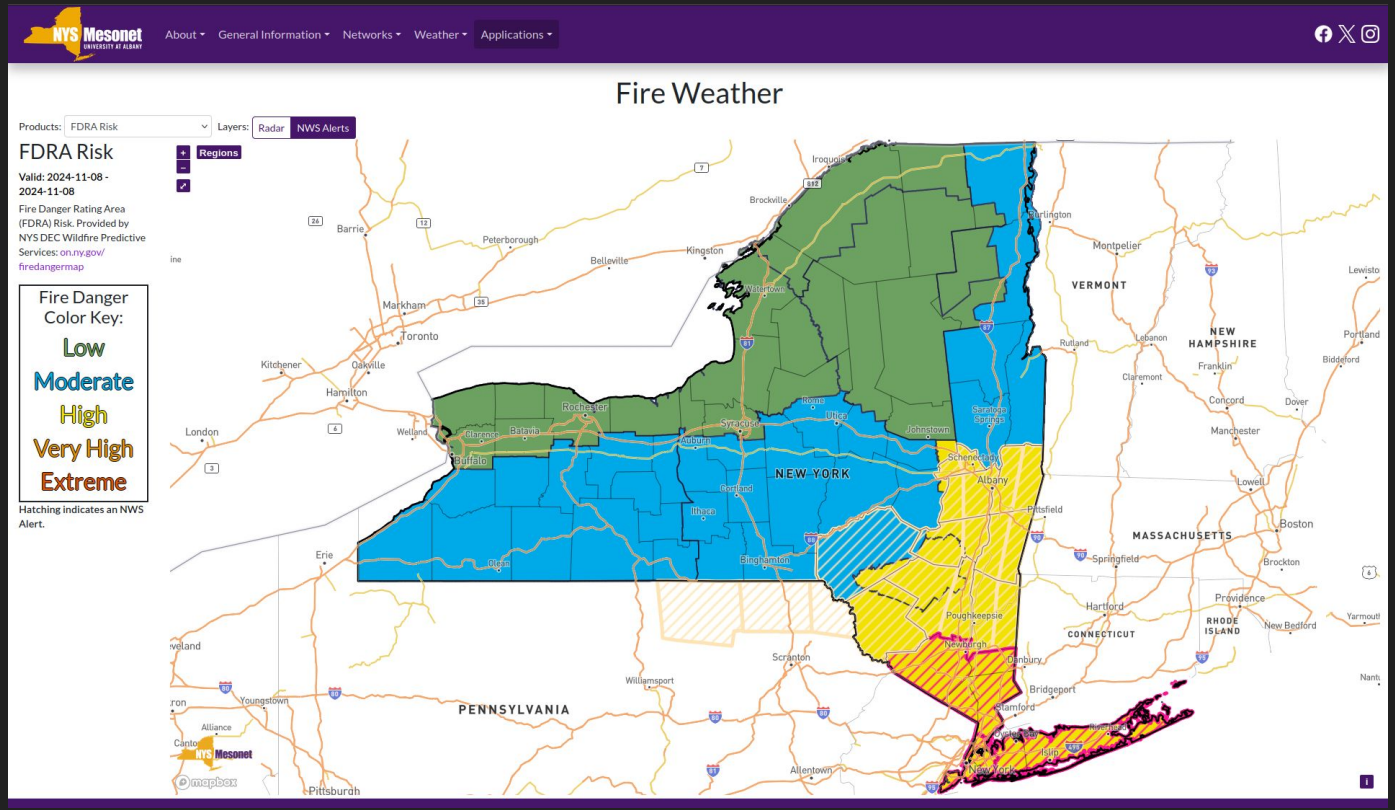
2024-11-08 13:51
-1 Day
Now
+1 Day
Select Map Layer:
FDRA
Select WIMS Layer:
none
Saved Risk Maps
No saved risk maps available
Risk Effective Date:
11 / 06 / 2024
Risk Valid Through:
11 / 06 / 2024
Save and Make Image
Save Map
Delete Map
Lake Ontario Plains
St. Lawrence
Upper Hudson Champlain
Hudson Valley
Catskill
Long Island
Leatherstocking
Southern Tier
Adirondack
Adirondack High Peaks
New York
Bronx
Long Island
Set Risk
Low
Moderate
High
Very High
Extreme
Hudson Valley
Long Island

https://api.nysmesonet.org/data/firewx/GetFDRA/image.php/image/latest



https://on.ny.gov/firedangermap

NYSM Fire Weather Product



https://nysmesonet.org/weather/firewx

Fire Weather

Products: 10hr Fuel Moisture ▾ Layers: Radar | NWS Alerts

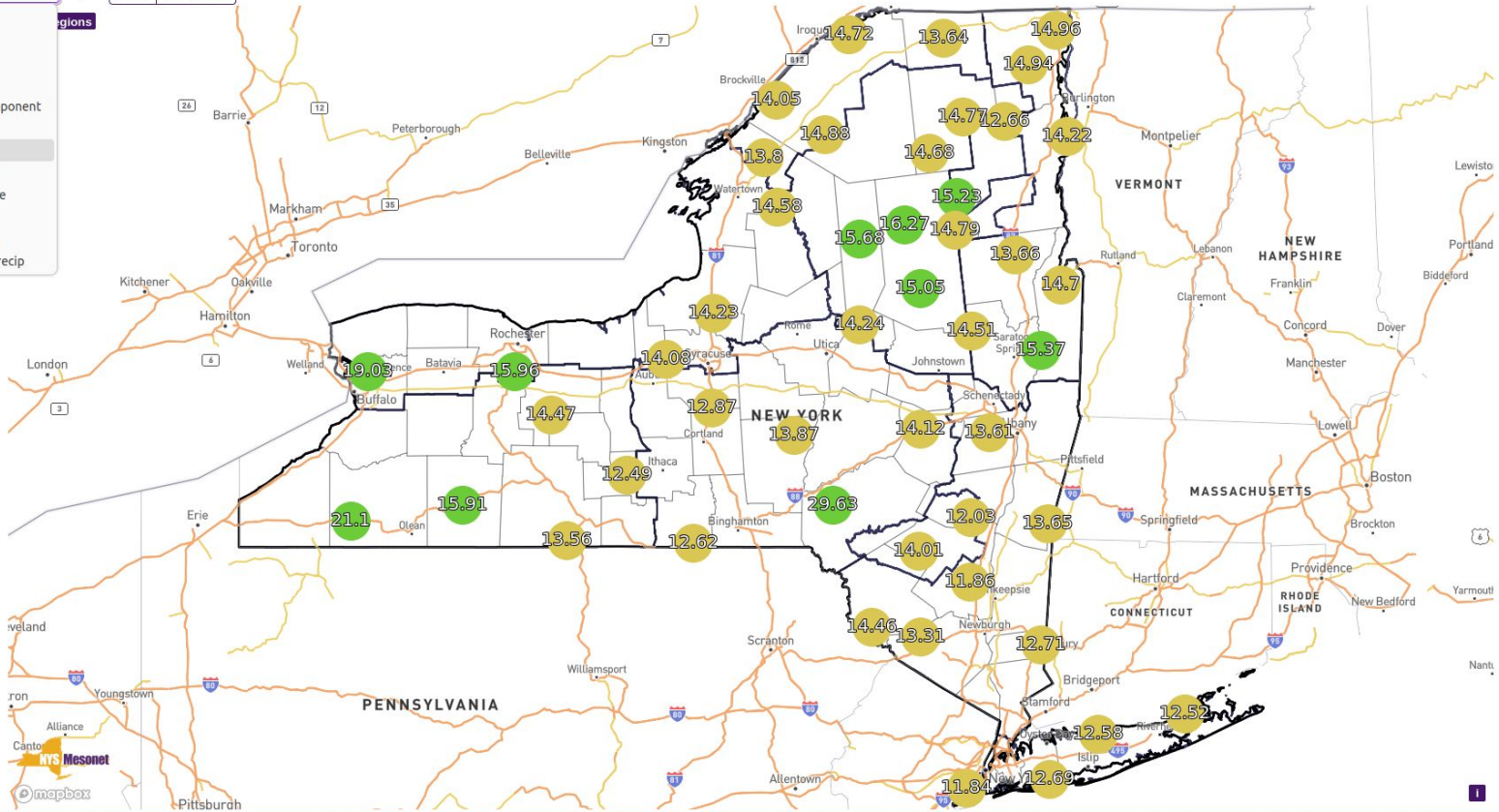
- FDRA Risk
- KBDI
- Ignition Component
- Spread Component
- Energy Release Component
- Burning Index
- 10hr Fuel Moisture
- 100hr Fuel Moisture
- 1000hr Fuel Moisture
- Snow Depth
- Snow Accumulation
- Total Liquid-Equiv Precip

10hr Mois

2024-11-

10-hour fu calculated model. Thi the moistu fine fuels and twigs diameter. reflects en changes, a adjust the in about 10 hours. A low 10-hour index indicates dry, highly flammable fuels, while a high index suggests moister, less ignitable conditions. This short-term moisture response helps assess immediate fire risks.

Hatching indicates an NWS Alert.



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About ▾ General Inform

Products: 10hr Fuel Moisture Layers: Radar

10hr Fuel Moisture

2024-11-10

10-hour fuel moisture is calculated using the Nelson model. This index measures the moisture content in small, fine fuels like grass, leaves, and twigs less than 1 inch in diameter. The model rapidly reflects environmental changes, as these fine fuels adjust their moisture content in about 10 hours. A low 10-hour index indicates dry, highly flammable fuels, while a high index suggests moister, less ignitable conditions. This short-term moisture response helps assess immediate fire risks.

Hatching indicates an NWS Alert.

Regions

Close

EDINBURG

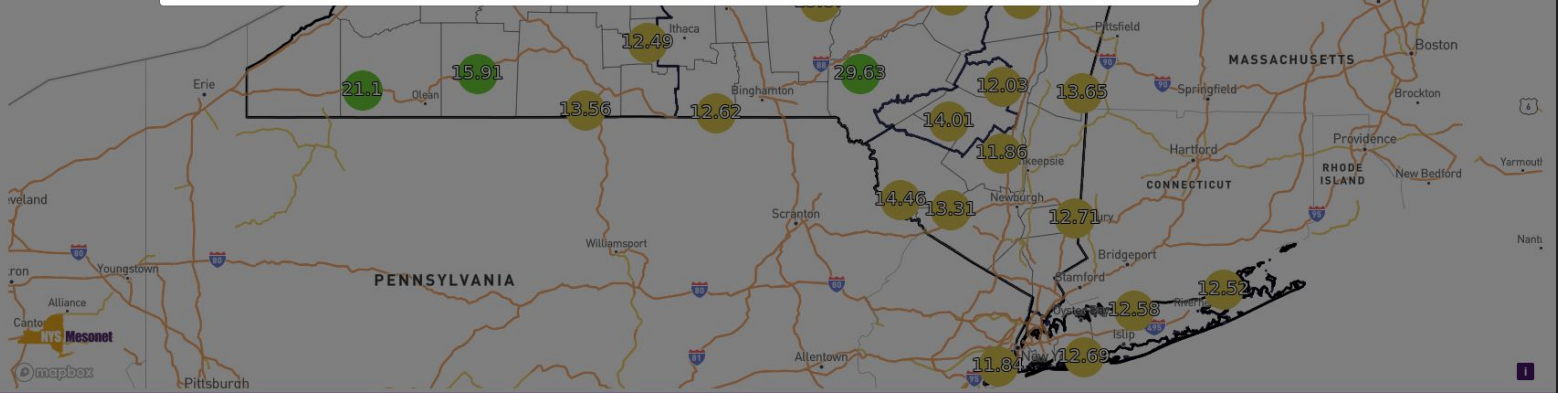
Conditions as of 8:45 AM

10hr Fuel Moisture ▾ Show Yearly Stats

Ten Hour Fuel Moisture Past 2 Weeks

Snow Depth					0"
	1-hr	3-hr	6-hr	12-hr	24-hr
Liquid-Equivalent	0.00"	0.00"	0.00"	0.01"	0.06"

Close



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10hr Fuel Moisture

2024-11-10

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Regions

Close

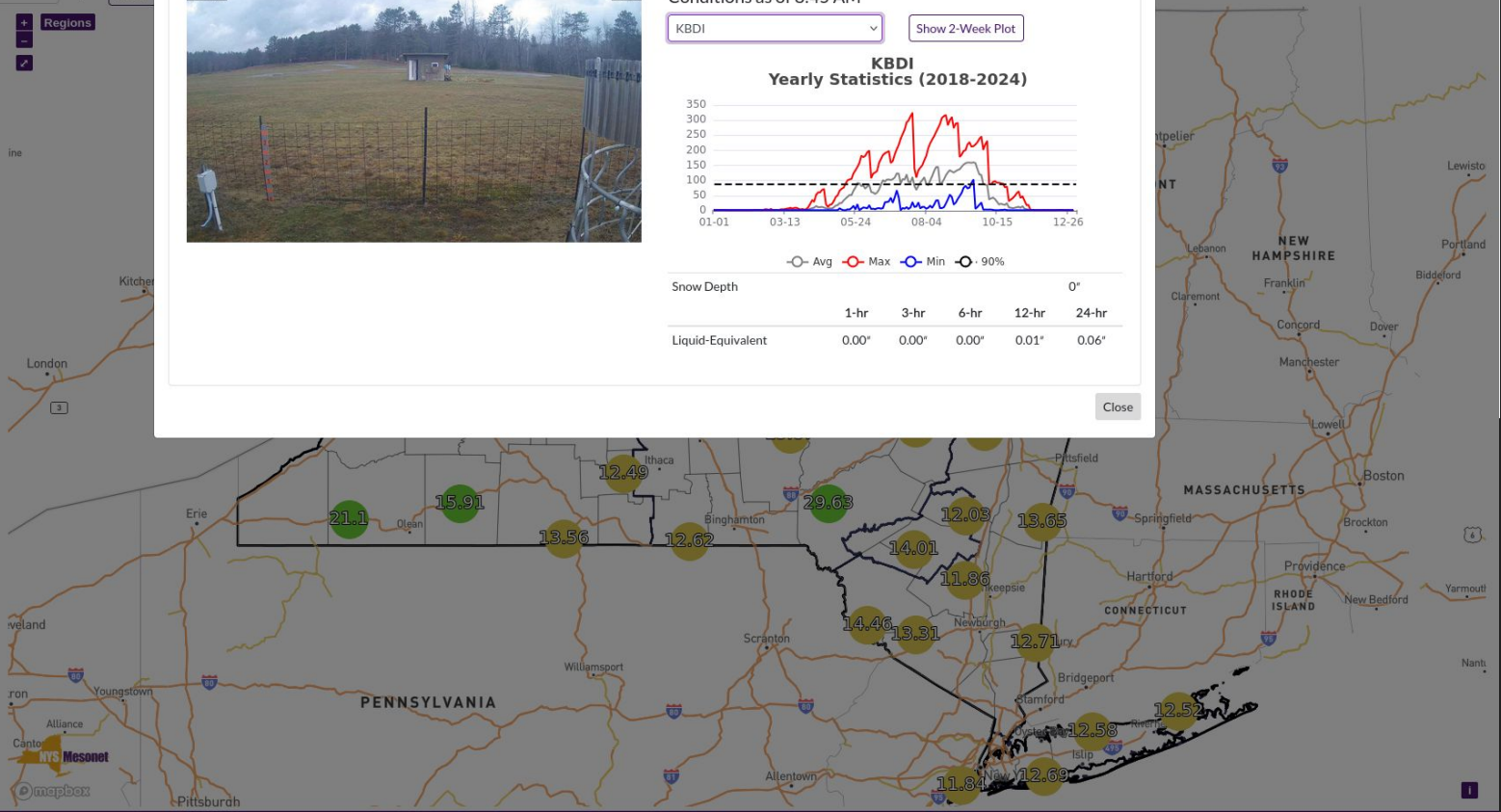
EDINBURG

Conditions as of 8:45 AM

KBDI | Show 2-Week Plot

Snow Depth					0"
	1-hr	3-hr	6-hr	12-hr	24-hr
Liquid-Equivalent	0.00"	0.00"	0.00"	0.01"	0.06"

Close



Acknowledgements

New York State Department of Environmental Conservation, Division of Forest Protection. *Fire Danger Map and Wildfire Resources.* Available at: https://dec.ny.gov/environmental-protection/wildfires/fire-danger-map

Wildfire.gov. *Weather Information Management System (WIMS)*. Retrieved from https://www.wildfire.gov

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New York State Mesonet. Available at https://nysmesonet.org/

Oklahoma Mesonet. Available at https://www.mesonet.org/