

National Weather Service On Site Decision Support for GMNF at the Robert Frost Prescribed Burn on 14 April 2023

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2024 Fire Weather Users Meeting
WFO Burlington, VT



Spot Forecasts

- NWS Burlington provided several spot forecasts to GMNF 12 to 24 hours prior to firing operations.
- Provides crew with what conditions to expect throughout the burn.
 - Especially important for winds, relative humidity, and mixing heights for smoke dispersion.
- Discussion was important for highlighting the impacts of the local terrain on the burn site.

Spot Forecast for Robert Frost...Federal or State Agency
National Weather Service Burlington VT
1032 AM EDT Fri Apr 14 2023

Forecast is based on ignition time of 1100 EDT on April 14.
If conditions become unrepresentative...contact the National Weather Service.

Please contact our office at (802) 658-0207, if you have questions or concerns with this forecast.

.DISCUSSION...

Unusual warmth and low humidity continue, but not as hot or dry as yesterday. Ample sun exposure, northwesterly transport wind, and local terrain will favor a westerly flow at the burn site with speeds running slightly higher than usual upslope driven conditions. As such, sustained speeds of 8 to 11 mph should be expected through the afternoon with gusts to around 15 mph. RH this afternoon will be dropping to near critical levels around 30% but will improve overnight with recoveries in the 65-75% range. High pressure ridging will settle over the site tonight suppressing mixing for Saturday while allowing winds to decouple completely overnight. Expect a downslope wind component to develop after sunset. The burn site's location may be influenced by higher terrain immediately south of the site early in the evening driving a brief light south flow before more typical easterly downslope develops after 2200 local time.

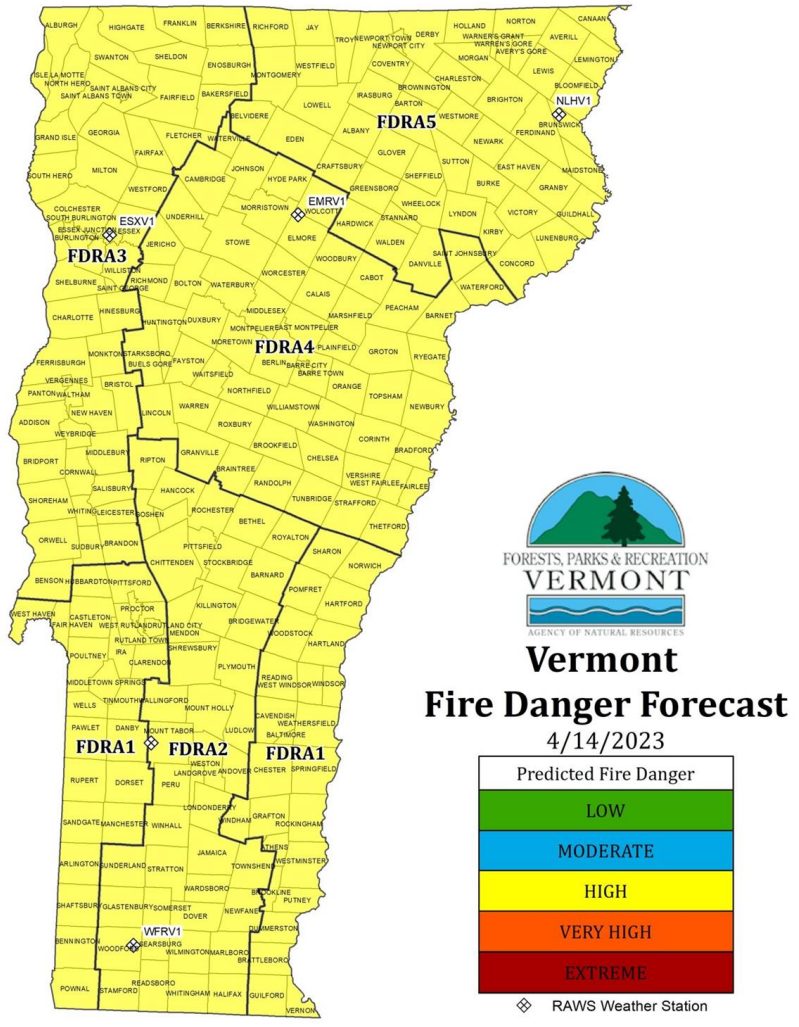
.REST OF TODAY...

Sky/weather.....Mostly sunny (25-35 percent) with periods of partly cloudy (35-50 percent) due to high clouds.
Chance of pcpn.....0 percent.
LAL.....1.
Max temperature.....74-76.
Min humidity.....28-33 percent.
Wind (20 ft).....West-northwest winds 6 to 9 mph increasing to 8 to 11 mph with gusts to 15 mph after 1300.
Mixing height.....3000 ft AGL.
Transport winds.....Northwest 7 to 9 mph.
Haines Index.....4 or low potential for large plume dominated fire growth.

TIME (EDT)	11 AM	1 PM	3 PM	5 PM
Sky (%).....	51	43	17	2
Weather cov.....				
Weather type....	NONE	NONE	NONE	NONE
Tstm cov.....				
Chc of pcpn (%)..	0	0	0	0
LAL.....	1	1	1	1
Temp.....	66	71	74	74
RH.....	48	38	35	35
20 ft wind.....	W 9	W 10	W 10	W 6
20 ft wind gust..				
Mix hgt (ft)....	2000	2600	3000	2400
Transport wind..	NW 9	NW 8	NW 7	N 7
Haines index....	4	4	4	4

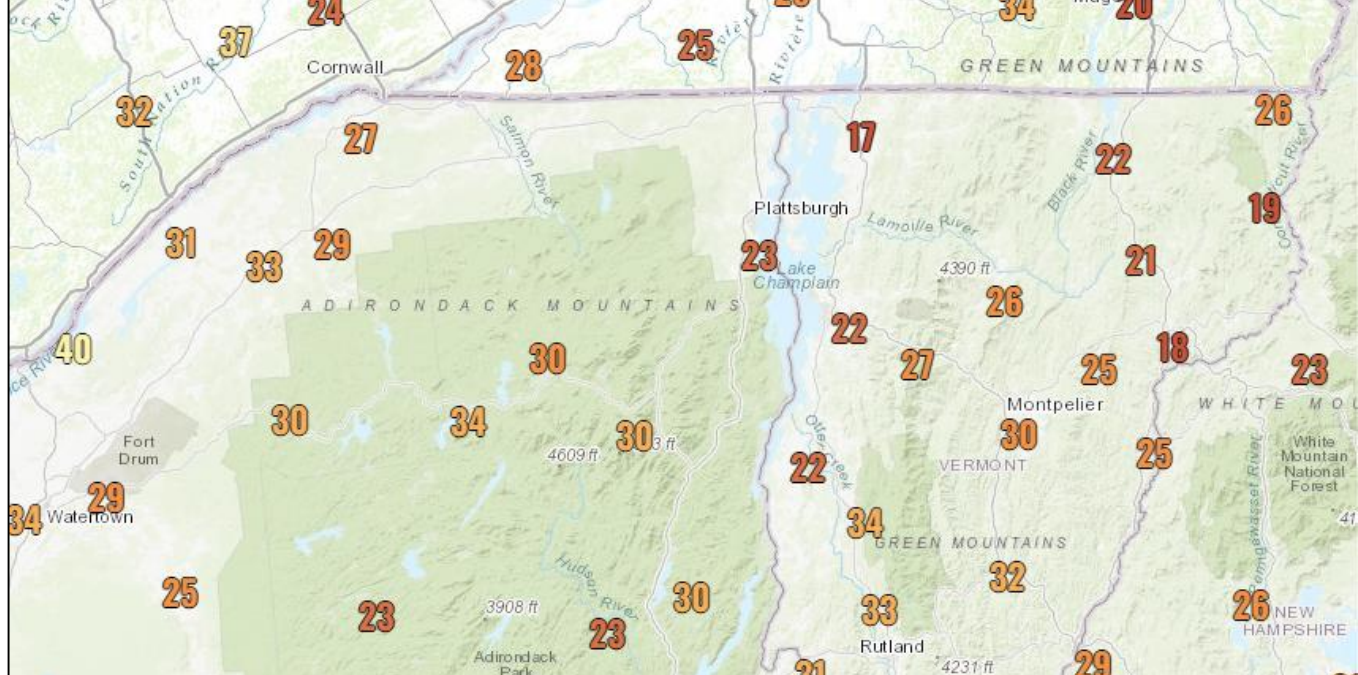
Weather Conditions

- The best days for prescribed burns are associated with near critical fire weather conditions.
- Early April was characterized by a prolonged period of dry weather due to high pressure building over the region.
 - Red Flag Warning was issued for the Champlain Valley earlier in the week.



Weather Conditions

- Near critical RH values across the region during a prolonged period of warm and dry weather.
- Winds were much lighter compared to the Red Flag Warning earlier in the week.



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FNUS51 KBTV 140959
FWFBTV

Fire Weather Planning Forecast for Central/Northern Vermont and Northern New York
National Weather Service Burlington VT
559 AM EDT Fri Apr 14 2023

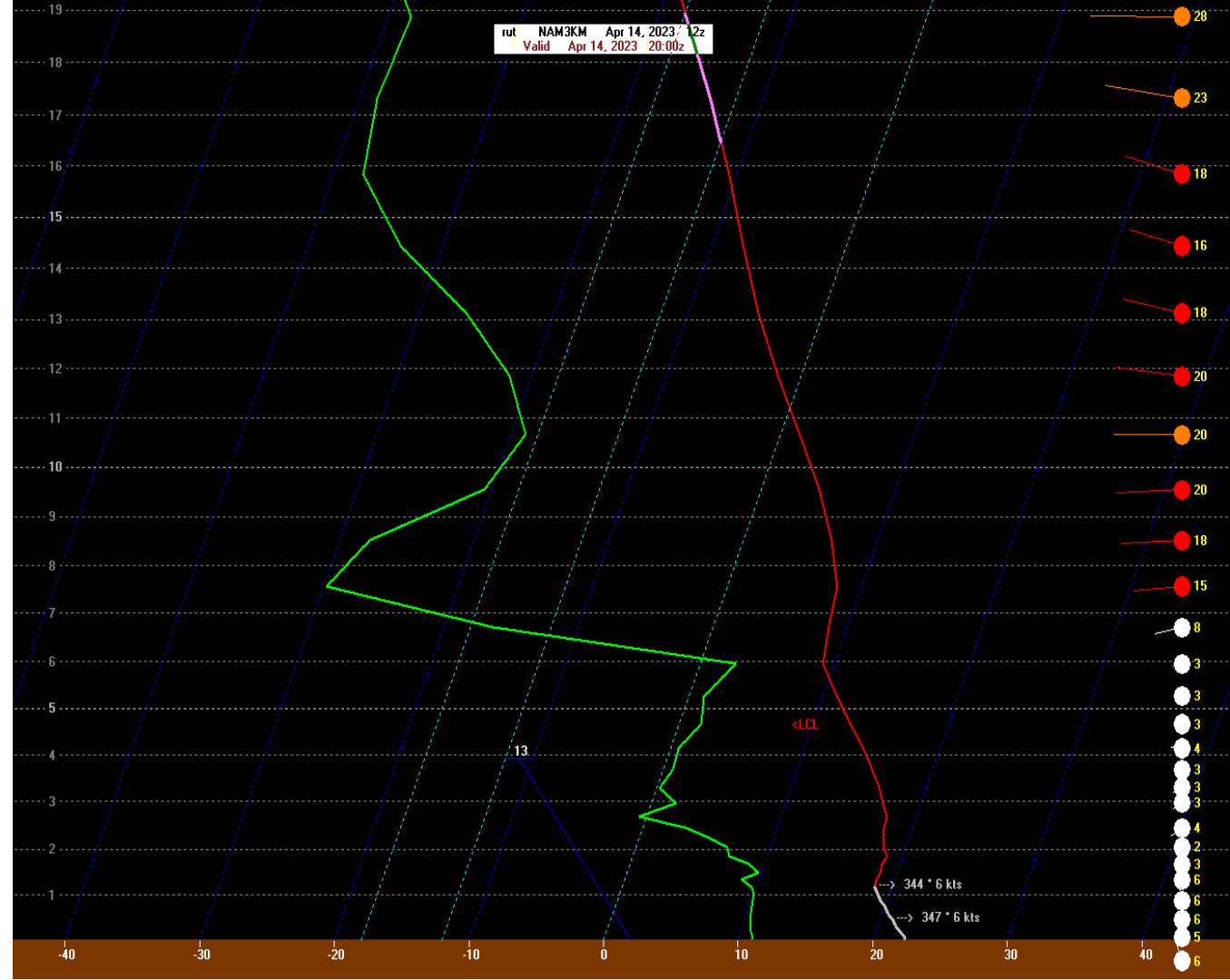
...Continued Dry and Warm Conditions Through Saturday...

.DISCUSSION...

Our extended period of dry conditions with near critically low relative humidity values continues today. Relative humidity values will fall below 30 percent for most locations, with lowest values favored in the lower elevations in northeastern Vermont today. However, northerly winds will be rather light during the day only near 10 MPH. Saturday will again feature dry conditions and light winds. Relative humidity values in eastern Vermont will recover somewhat, while lowest values, under 30%, are most likely in northern Champlain Valley.

Weather Conditions

- NAM 3KM model sounding for Rutland (RUT) the afternoon of the prescribed burn.
- Drier air between 2000-3000 feet mixed toward the surface.
- Very light northwest to west winds 4 to 8 knots.



Weather Briefing

- Meteorologists provided the crew with a verbal weather briefing the morning of the burn at the GMNF Rochester Ranger Station prior to firing operations.
 - The verbal briefing is often very similar to the spot forecast.
 - Provides situational awareness for the entire crew involved in the prescribed burn.
 - Allows for two way communication and a chance to ask questions before the prescribed burn.

About the Burn Site

- Robert Frost Interpretive Trail in Ripton, VT.
- Meteorologists were stationed about $\frac{1}{4}$ mile away from the burn site in a location with similar conditions in order to provide accurate observations.
 - Being further from the burn site allowed for good observations on smoke behavior.



During the Prescribed Burn

- Throughout the burn, weather observations were taken every half hour to update the crew via radio.
 - Observations included the current temperature, RH, wind speed and direction (including gusts).
 - Fine Dead Fuel Moisture (FDFM) and Probability of Ignition (PIG) were also relayed to the crew to provide insight on the fire behavior.
- Smoke behavior and movement were also shared so the crew had a sense of any impacts given the proximity to Rt. 125 and the Middlebury Bread Loaf Campus.

April 14, 2023 Robert Frost Prescribed Burn

WEATHER PREDICTED / Spot Wx Forecast							
Time	Temp	RH	Wind	FDFM	PIG	KBDI	10-HR FM


Reference forecast 10-hr FM Dead Fuel Moisture - NFDRS (wfas.net)

Weather Observed					
Time	Temp	RH	Wind	FDFM	PIG
1230	72	40%	3-5-6 7 mph	6%	
1300	74	40%	WNW 2-4 6-8 mph	6%	50
1400	76	38%	light winds	6%	60 1410 WNW
1430	76	37%	W 2-5 mph 6-8	6%	60
1500	77	36%	W 2-4 6-8	6%	60
1530	78	36%	W 1-2 6-5	6%	60
1600	79	33%	W 1-3 6-5	6%	60

Notes: (e.g., Smoke, Flame Length, Rate of Spread)
 Smoke lift above canopy @ dispersing up valley toward Breadloaf.

Comments & Recommendations:
 (e.g., if objectives weren't met what prescription or fuel moisture conditions would help achieve desired effects?)

Strata
Substrates: Soil & Duff Layer, Leaf Litter
Grass/Forb: Small Shrub <3' (1-10 hr fuels)
Tall Shrub >3' (10-100 hr fuels)





Overall Takeaways

- The prescribed burn was a great success with all of the roughly 7 acres properly and safely burned.
 - This will promote growth of the blueberries located in the Robert Frost Interpretive Trail and improved habitat for the local wildlife.
- On-site support allows NWS Burlington to build our relationship with GMNF and our other fire weather partners.

