

# 2022 Upper Michigan Fire Weather Annual Operating Plan

Marquette, MI  
(MQT)

Updated **May 5, 2022**



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## I. INTRODUCTION

This Annual Operating Plan (AOP) will identify meteorological services to be provided by the Marquette, Michigan National Weather Service (NWS) Office. The area of responsibility encompasses all Upper Michigan. This includes areas of the Michigan Department of Natural Resources (DNR), Isle Royale National Park in the northwest, the Ottawa National Forest across the west, the Hiawatha National Forest central and east, Pictured Rocks National Lakeshore along portions of Lake Superior, Seney National Wildlife Refuge east, and the Bureau of Indian Affairs.

This NWS is supported by the Eastern Geographic Area Coordination Center (EACC).

Services provided by the NWS fall into two categories, traditional and special services. The traditional services are provided without cost and are coordinated between the user and the NWS office personnel. Most of these products are available upon request 24 hours a day throughout the year. Examples of traditional/core services include...

- Fire Weather Planning Forecast (FWF)
- Fire Weather Matrix (FWM) forecast for the National Fire Danger Rating System (NFDRS)
- Spot forecast
- Special Weather Statements
- Fire Weather Watches and Red Flag Warnings
- Hot Spot Notifications
- Situation Reports
- Online Products (Fire Weather Graphics, Hourly Weather Graph, etc.)

Special services provided may include teaching weather related courses or an on-site Incident Meteorologist (IMET). Please reference the Geographic Area Mobilization Guide and/or the National Mobilization Guide for details about these special services.

## II. SERVICE AREA AND ORGANIZATIONAL DIRECTORY

### A. List of National Weather Service (NWS) offices and points of contact

#### 1. Marquette, Michigan (MQT) office

Fire Weather Season: Traditionally April 15 to November 1. Wildfires across our area can occur almost any time of the year; however, there are generally two peaks of increased fire danger. These time periods are in the spring prior to green-up, and in the fall curing period prior to significant snow. If unavailable, our primary backup office is Gaylord, Michigan.

Online: [www.weather.gov/mqt/fire](http://www.weather.gov/mqt/fire) (Fire Page – Upper MI)  
<https://www.weather.gov/spot/request/> (Spot Page)  
<http://graphical.weather.gov/sectors/mqtFireDay.php>  
(Graphical Forecast Fire Page – Upper MI)  
<http://digital.weather.gov/> (Graphical Forecast Fire Page – U.S.)  
[www.weather.gov/mqt](http://www.weather.gov/mqt) (Forecast Area main page)  
<http://weather.gov/fire> (National Page)

Phone: 906-475-5213  
906-475-6205  
906-475-6305 fax  
906-475-5212 public

Address: 112 Airpark Drive South  
Negaunee, MI 49866

Fire Weather Program Leader: Jon Voss, [jonathan.voss@noaa.gov](mailto:jonathan.voss@noaa.gov)  
Assistant Jordan Wendt, [jordan.wendt@noaa.gov](mailto:jordan.wendt@noaa.gov)

Team Member(s):

Joseph Phillips

Meteorologist in Charge:

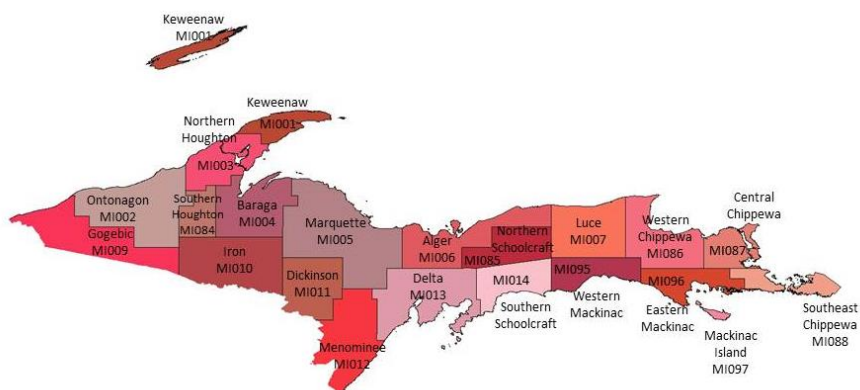
Robin Turner, [Robin.J.Turner@noaa.gov](mailto:Robin.J.Turner@noaa.gov)

Watch/Warning Criteria:

- A dry spell for over a week (shorter before spring green-up or after fall color)
- Sustained Wind Speed  $\geq 20$  mph (10 m ASOS-Airport winds)  
or  $\geq 15$  mph (20 ft RAWs winds)
- Relative Humidity 25% or less
- Temperature 70 F or greater

*Note: Temperature criteria is a soft criteria. Red Flag Warnings can be used for temperatures less than 70 degrees depending on other factors. If frequent wind gusts above wind advisory criteria, treat wind gusts as the sustained wind.*

## Marquette, Michigan Fire Weather Forecast Area



### Upper Michigan Zone/County Names and Zone Numbers

Zone/County Name	Zone Numbers	Zone/County Name	Zone Numbers
Keweenaw (including Isle Royale)	MI001	Alger	MI006
Northern Houghton	MI003	Northern Schoolcraft	MI085
Southern Houghton	MI084	Southern Schoolcraft	MI014
Ontonagon	MI002	Luce	MI007
Gogebic	MI009	Western Chippewa	MI086
Baraga	MI004	Central Chippewa	MI087
Iron	MI010	Southwest Chippewa	MI088
Marquette	MI005	Mackinac Island	MI097
Dickinson	MI011	Eastern Mackinac	MI096
Menominee	MI012	Western Mackinac	MI095
Delta	MI013		

## 2. Surrounding National Weather Service offices

### a) Duluth, Minnesota (DLH) office

Online: [www.weather.gov/dlh/fire](http://www.weather.gov/dlh/fire) (Fire Page)  
[www.weather.gov/dlh](http://www.weather.gov/dlh) (Forecast Area main page)  
 Phone: 218-729-6572  
 218-729-0653  
 218-729-0690 fax  
 218-729-6697 public  
 Address: 5027 Miller Truck Highway

Duluth, MN 55811-1442  
Fire Weather Program Leader:  
Jonathan Wolfe, [jonathan.wolfe@noaa.gov](mailto:jonathan.wolfe@noaa.gov)  
Meteorologist in Charge:  
Chris Gitro, [christopher.gitro@noaa.gov](mailto:christopher.gitro@noaa.gov)  
Watch/Warning Criteria:  
Relative Humidity < = 25%  
Wind Speed > = 20 mph  
Temperature > = 75 degrees F

*b) Green Bay, Wisconsin (GRB) office*

Online: [www.weather.gov/grb/fire](http://www.weather.gov/grb/fire) (Fire Page)  
[www.weather.gov/grb](http://www.weather.gov/grb) (Forecast Area Main Page)  
Phone: 920-494-7478  
920-497-8771  
920-494-5823 fax  
920-494-2363 public  
Address: 2485 South Point Road  
Green Bay, WI 54313-5522  
Fire Weather Program Leader:  
Tim Kieckbusch, [Tim.Kieckbusch@noaa.gov](mailto:Tim.Kieckbusch@noaa.gov)  
Assistant Fire Weather Program Leader:  
Keith Cooley, [Keith.Cooley@noaa.gov](mailto:Keith.Cooley@noaa.gov)  
Meteorologist in Charge:  
Matthew Lorentson, [Matthew.Lorentson@noaa.gov](mailto:Matthew.Lorentson@noaa.gov)  
Watch/Warning Criteria:  
Relative Humidity < = 25%  
Wind Speed (20 ft, 10 min avg.) > = 15mph  
~17 mph, 10m airport wind  
Temperature > = 75 degrees F

*c) Gaylord, Michigan (APX) office*

Online: [www.weather.gov/apx/fire](http://www.weather.gov/apx/fire) (Fire Page)  
[www.weather.gov/apx](http://www.weather.gov/apx) (Forecast Area Main Page)  
Phone: 989-732-9306  
989-732-6018  
989-731-0682 fax  
989-731-3384 public  
Address: 8800 Passenheim Road  
Gaylord, MI 49735-9454  
Fire Weather Program Leader:  
Jeffrey Lutz, [Jeffrey.Lutz@noaa.gov](mailto:Jeffrey.Lutz@noaa.gov)  
Meteorologist in Charge:  
Jim Keysor, [James.Keysor@noaa.gov](mailto:James.Keysor@noaa.gov)  
Watch/Warning Criteria:  
Relative Humidity < = 25%  
Sustained Wind Speed > = 20 mph (10 m ASOS winds) or

>= 15 mph (20 ft RAWs winds)  
\*frequent gusts above wind criteria may be used in  
place of sustained winds.  
Temperature > = 75 degrees F

*d) Grand Rapids (GRR), Detroit (DTX), and Northern Indiana (IWX) offices*

Grand Rapids (GRR) [www.weather.gov/grr/fire](http://www.weather.gov/grr/fire) (Fire Page)

Phone: 616-949-5150  
616-949-0643  
606-949-1708 fax

Fire Weather Program Leaders:

Cort Scholten, [cort.scholten@noaa.gov](mailto:cort.scholten@noaa.gov)  
Nathan Jeruzal, [Nathan.Jeruzal@noaa.gov](mailto:Nathan.Jeruzal@noaa.gov)

Meteorologist in Charge:

Richard Wagenmaker,  
[Richard.Wagenmaker@noaa.gov](mailto:Richard.Wagenmaker@noaa.gov)

Watch/Warning Criteria:

Relative Humidity < = 25%  
Sustained Wind Speed > = 20 mph (10 m ASOS  
winds) or >= 15 mph (20 ft RAWs winds)  
\*frequent gusts above wind criteria may be  
used in place of sustained winds.  
Temperature > = 75 degrees F

Detroit (DTX) [www.weather.gov/dtx/fire](http://www.weather.gov/dtx/fire) (Fire Page)

Phone: 248-625-4139  
248-625-4249  
248-625-4834 fax  
248-620-9804 public

Fire Weather Program Leader:

Kevin Kacan, [Kevin.Kacan@noaa.gov](mailto:Kevin.Kacan@noaa.gov)

Meteorologist in Charge:

Richard Wagenmaker,  
[Richard.Wagenmaker@noaa.gov](mailto:Richard.Wagenmaker@noaa.gov)

Watch/Warning Criteria:

Relative Humidity < = 25%  
Sustained Wind Speed > = 20 mph (10 m ASOS  
winds) or >= 15 mph (20 ft RAWs winds)  
Temperature > = 75 degrees F

Northern Indiana (IWX) [www.weather.gov/iwx/fire](http://www.weather.gov/iwx/fire) (Fire Page)

Phone: 574-834-1183  
574-834-3492 fax  
574-834-1104 public

Fire Weather Program Leader:

Rachel Cobb, [Rachel.Cobb@noaa.gov](mailto:Rachel.Cobb@noaa.gov)

Assistant Fire Weather Program Leader:

Lonnie Fisher, [Lonnie.Fisher@noaa.gov](mailto:Lonnie.Fisher@noaa.gov)

Meteorologist in Charge:



Mark Frazier, [Mark.Frazier@noaa.gov](mailto:Mark.Frazier@noaa.gov)  
Watch/Warning Criteria:  
Relative Humidity < = 25%  
Sustained Wind Speed > = 20 mph (10 m ASOS  
winds) or >= 15 mph (20 ft RAWS winds)  
Temperature > = 75 degrees F

### 3. Other important NWS contacts

#### a) National Fire Weather Program Leader and Operations Coordinator

Online: <http://weather.gov/fire>  
Heath Hockenberry – Program Leader 208-334-9862  
[Heath.Hockenberry@noaa.gov](mailto:Heath.Hockenberry@noaa.gov)  
Larry Van Bussum – Ops. Coordinator 208-334-9824, or 9862  
208-863-2582 cell  
[Larry.Vanbussum@noaa.gov](mailto:Larry.Vanbussum@noaa.gov)  
208-334-1660 fax  
Address: National Weather Service  
3833 South Development Avenue, Bldg. 3807  
Boise, ID 83705

#### b) Regional Operational Services Meteorologist (ROSM)

Online: [www.crh.noaa.gov](http://www.crh.noaa.gov)  
Chris Foltz – Central Region 816-268-3143  
Headquarters Emergency 816-891-7810 fax  
Response Specialist  
Address: National Weather Service,  
Central Region Headquarters  
7220 NW 101<sup>st</sup> Terrace  
Kansas City, MO 64153

## B. Participating agencies

### 1. Contacts and phone numbers

#### *a) Eastern Area Coordination Center (EACC)*

Online: <http://gacc.nifc.gov/eacc>  
Floor Coordinator 414-944-3811  
414-944-3838 fax  
Address: Eastern Area Coordination Center  
626 East Wisconsin Avenue, Suite 500  
Milwaukee, WI 53202  
Stephen Marien – Fire Weather 651-293-8446  
Program Manager 402-250-7844 cell  
651-290-3815 fax  
[Stephen\\_Marien@nps.gov](mailto:Stephen_Marien@nps.gov)  
Address: Mississippi National River and Recreation Area  
111 East Kellogg Blvd, Suite 150  
St. Paul, MN 55101

#### *b) Hiawatha National Forest, USFS*

Online: [www.fs.usda.gov/hiawatha](http://www.fs.usda.gov/hiawatha)  
Dispatch Center- Michigan Interagency 231-775-8732  
Dispatch Center (MIDC) [SM.FS.midc@usda.gov](mailto:SM.FS.midc@usda.gov)  
MIDC manager – Kim Owczarzak 231-942-4527  
Eric Rebitzke – Fire Management 906-428-5856  
Officer 906-241-5719 cell  
[eric.rebitzke@usda.gov](mailto:eric.rebitzke@usda.gov)  
Sam Duerksen– Assistant Fire 906-285-6889  
Management Officer 906-241-8154 cell  
[sam.duerksen@usda.gov](mailto:sam.duerksen@usda.gov)  
Brenda Dale – East Zone FMO (St. Ignace) 906-643-7900 ext. 127  
906-280-3398 cell  
[brenda.dale@usda.gov](mailto:brenda.dale@usda.gov)  
906-428-9030 fax  
906-428-5800 public  
Cory Henry - Central Zone FMO (Munising) (906) 474-6442 x121  
(906) 280-4144  
[cory.r.henry@usda.gov](mailto:cory.r.henry@usda.gov)

Address: 820 Rains Dr. Gladstone, MI 49837

*a) Ottawa National Forest, USFS*

Online: [www.fs.fed.us/r9/ottawa](http://www.fs.fed.us/r9/ottawa)

Dispatch Center- Michigan Interagency 231-775-8732

Dispatch Center (MIDC) [SM.FS.midc@usda.gov](mailto:SM.FS.midc@usda.gov)

MIDC manager – Kim Owczarzak 231-942-4527

Eric Rebitzke– Forest Fire 906-428-5856

Management Officer 906-241-5719 cell

[eric.rebitzke@usda.gov](mailto:eric.rebitzke@usda.gov)

Sam Duerksen- Assistant Forest Fire 906-285-6889

Management Officer 906-241-8154

[sam.duerksen@usda.gov](mailto:sam.duerksen@usda.gov)

Forest Paukert – West Zone Fire 906-358-4036

Management Officer 906-336-0109 cell

Address: E23979 US Highway 2 East

Watersmeet, MI 49969

*b) Isle Royale National Park, NPS*

Online: [www.nps.gov/isro](http://www.nps.gov/isro)

Coral Conway – Chief Ranger 906-487-7148

906-275-9027 cell

906-487-7170 (fax)

906-482-0984 public

[coral\\_conway@nps.gov](mailto:coral_conway@nps.gov)

Michael Ausema – East District Ranger 906-487-7173

906-231-2990 cell

[michael\\_ausema@nps.gov](mailto:michael_ausema@nps.gov)

Lynette Potvin – Ecologist 906-487-7159

[lynette\\_potvin@nps.gov](mailto:lynette_potvin@nps.gov)

Address: 800 East Lakeshore Drive

Houghton, MI 49931

*c) Michigan Department of Natural Resources (DNR)*

Online: [www.michigan.gov/dnr](http://www.michigan.gov/dnr)

Duty Officer 906-249-9222 24-hr #

906-249-3080 fax

906-249-1497 public

Celeste Chingwa – Resource Protection [chingwac@michigan.gov](mailto:chingwac@michigan.gov)

Manager

Scott Lakosky – Fire Specialist [lakoskys@michigan.gov](mailto:lakoskys@michigan.gov)

Keith Murphy – Fire Specialist [murphyk1@michigan.gov](mailto:murphyk1@michigan.gov)

Debbie Wester – Dispatcher/Secretary [westerd@michigan.gov](mailto:westerd@michigan.gov)  
Address: 110 Ford Road  
Marquette, MI 49855

*d) Pictured Rocks National Lakeshore, NPS*

Online: [www.nps.gov/piro](http://www.nps.gov/piro)  
Matt Davis – Park Ranger 906-494-2669 Grand Marais Ranger Stn.  
906-202-3191 cell  
[matthew\\_davis@nps.gov](mailto:matthew_davis@nps.gov)  
Bruce Leutusher – Chief of Science & 906-387-2680  
Natural Resources 906-387-4025 fax  
906-387-2607 public/headquarters  
906-387-3700 public/ Visitors Center  
Address: N8391 Sand Point Road  
P.O. Box 40  
Munising, MI 49862-0040

*e) Seney National Wildlife Refuge, USFW*

Online: [www.fws.gov/refuge/seney/](http://www.fws.gov/refuge/seney/)  
Josh Haen – Fire Management 906-586-9851 ext. 19  
Officer 906-235-2334 work cell  
906-284-8895 home cell  
[joshua\\_haen@fws.gov](mailto:joshua_haen@fws.gov)  
Greg McClellan –Refuge Assistant 906-586-9851 ext. 13  
Manager 906-235-2335 work cell  
906-291-0032 home cell  
[greg\\_mcclellan@fws.gov](mailto:greg_mcclellan@fws.gov)  
Sara Siekierski – Refuge Manager 906-586-9851 ext.11  
906-630-2015 work cell  
419-260-6166 home cell  
906-586-9851 public  
906-586-3800 fax  
[sara\\_siekierski@fws.gov](mailto:sara_siekierski@fws.gov)  
Address: USFWS Seney NWR  
1674 Refuge Entrance Road  
Seney, MI 49883  
Dan Laber – Zone Fire Management 608-565-4407  
Officer WI and MI 608-377-0259 cell  
[daniel\\_laber@fws.gov](mailto:daniel_laber@fws.gov)  
Address: USFW Necedah NWR  
N11385 Headquarters Road  
Necedah, WI 54646

*f) US Bureau of Indian Affairs (BIA)*

Will Wiggins – Fire Management 906-353-7289 office  
Officer/ Fuels Specialist 906-869-0201 cell

Address: 100 Hemlock Street  
 Baraga, MI 49908  
 Scott Virden – Forester  
 Address: 2845 Ashmund Street  
 Sault Sainte Marie, MI 49783

906-353-7299 fax  
[christopher.wiggins@bia.gov](mailto:christopher.wiggins@bia.gov) (primary)  
[wwiggins@up.net](mailto:wwiggins@up.net) (secondary)  
 906-632-6809 ext. 3131  
 906-630-0366 cell  
 906-632-0689 fax  
[scott.virden@bia.gov](mailto:scott.virden@bia.gov)

## 2. Agency area maps

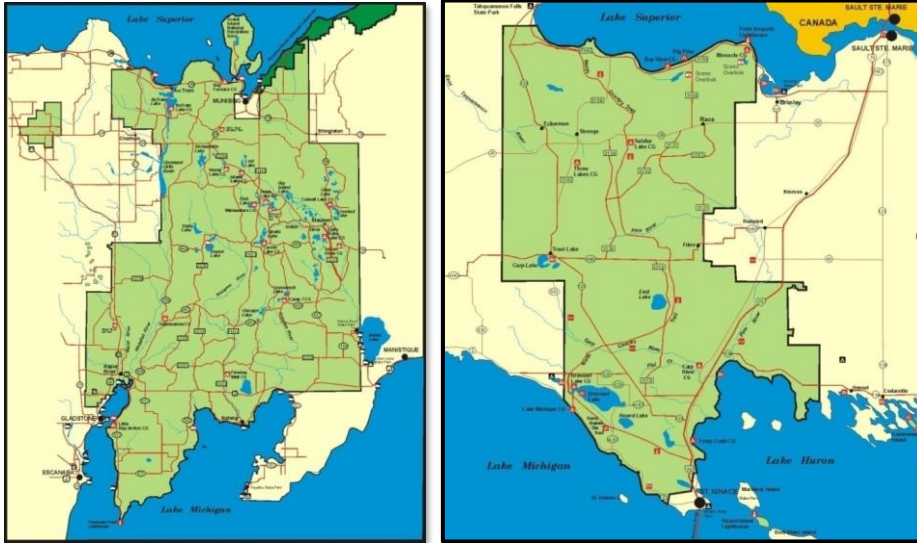
### a) Hiawatha National Forest, USFS

Images courtesy Hiawatha National Forest (<http://www.fs.usda.gov/hiawatha>)

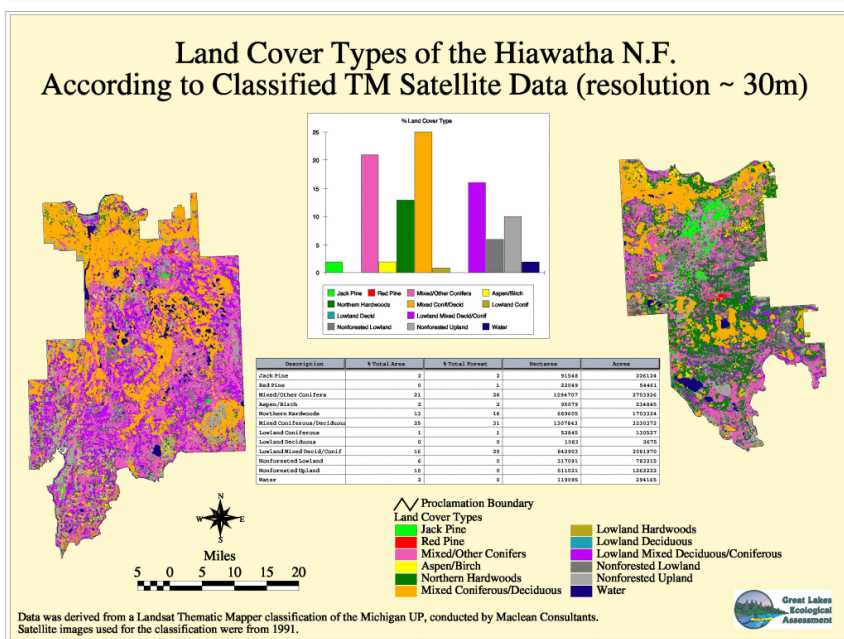
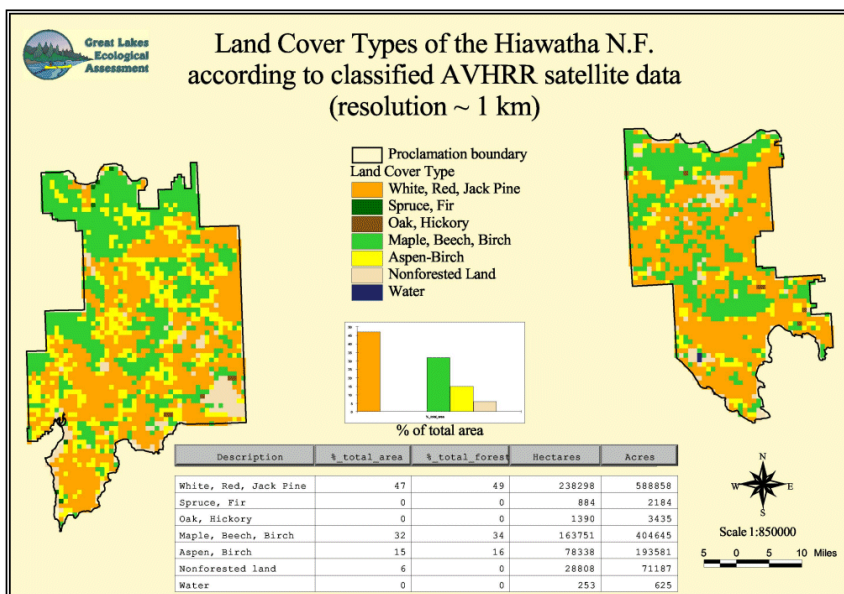


Central Unit

Eastern Unit



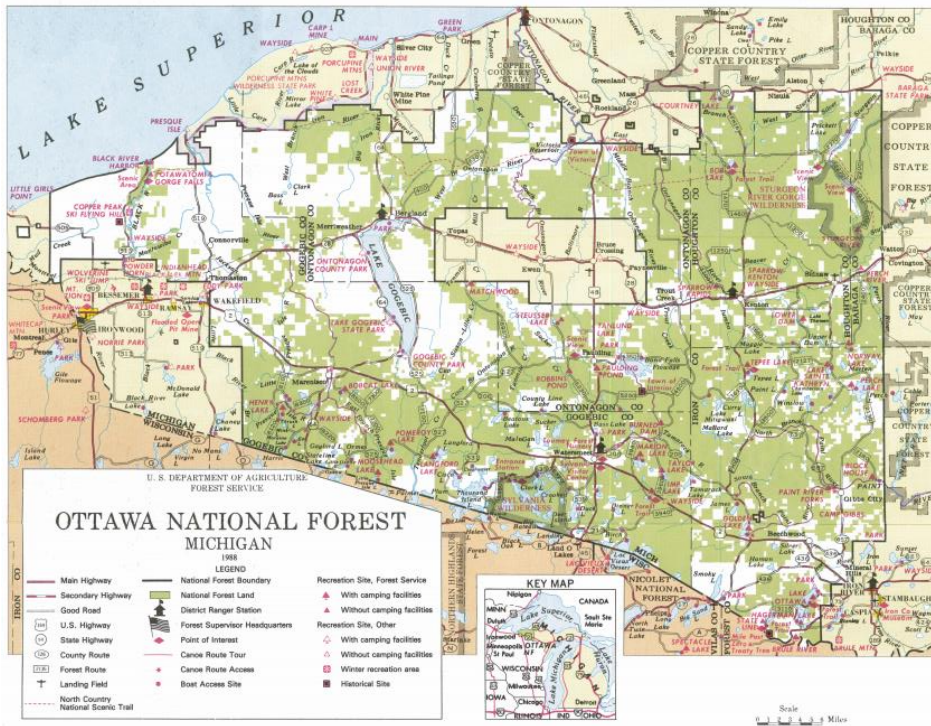
Land Cover Types image courtesy Great Lakes Ecological Assessment  
[http://www.ncrs.fs.fed.us/gla/existveg/images/hiaw\\_avhrr.gif](http://www.ncrs.fs.fed.us/gla/existveg/images/hiaw_avhrr.gif) and  
[http://www.ncrs.fs.fed.us/gla/existveg/hiwa\\_tm.htm](http://www.ncrs.fs.fed.us/gla/existveg/hiwa_tm.htm) based off of 1991 satellite





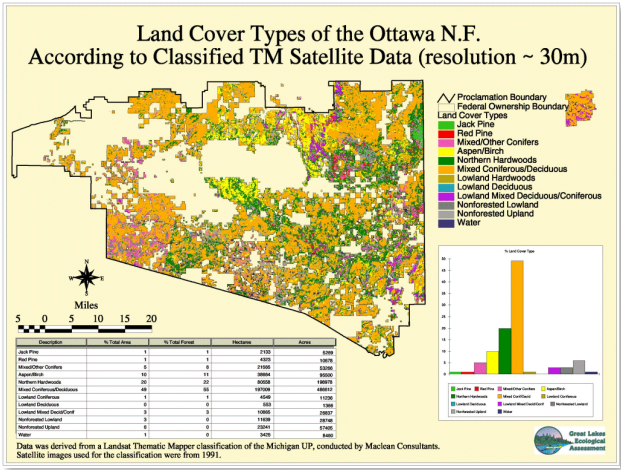
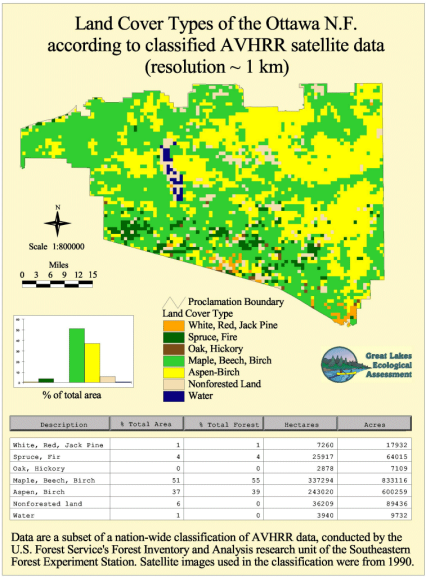
b) Ottawa National Forest, USFS

Image courtesy Ottawa National Forest (<http://www.fs.usda.gov/main/ottawa/maps-pubs>)



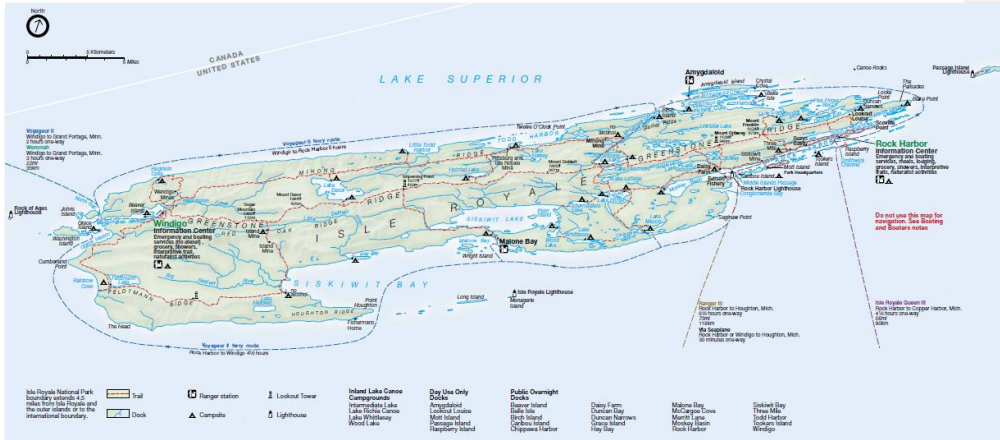


Land Cover Types image courtesy Great Lakes Ecological Assessment  
([http://www.ncrs.fs.fed.us/gla/existveg/ott\\_avhrr.htm](http://www.ncrs.fs.fed.us/gla/existveg/ott_avhrr.htm) and  
[http://www.ncrs.fs.fed.us/gla/existveg/ott\\_tm.htm](http://www.ncrs.fs.fed.us/gla/existveg/ott_tm.htm))

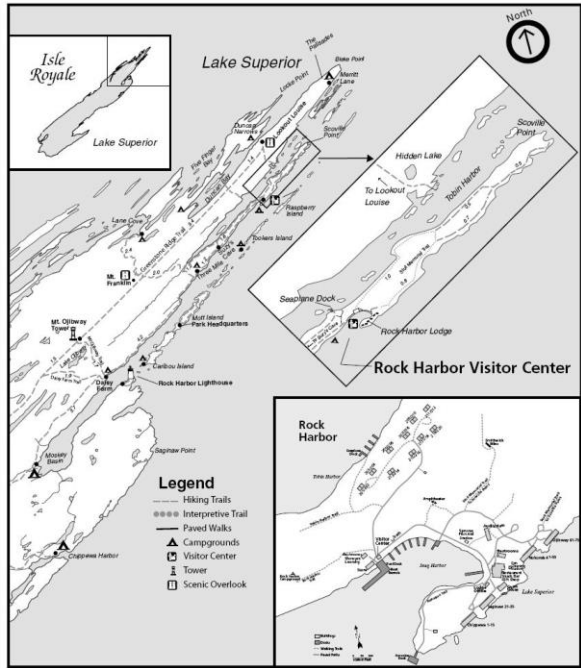


c) Isle Royale National Park, NPS

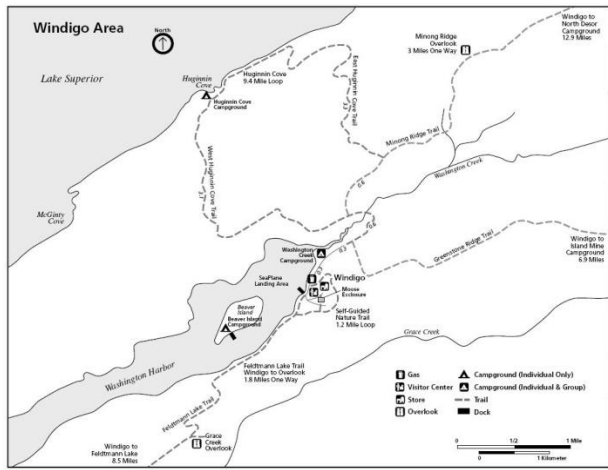
Images courtesy Isle Royale National Park (<http://www.nps.gov/isro/index.htm>)



## Rock Harbor Area



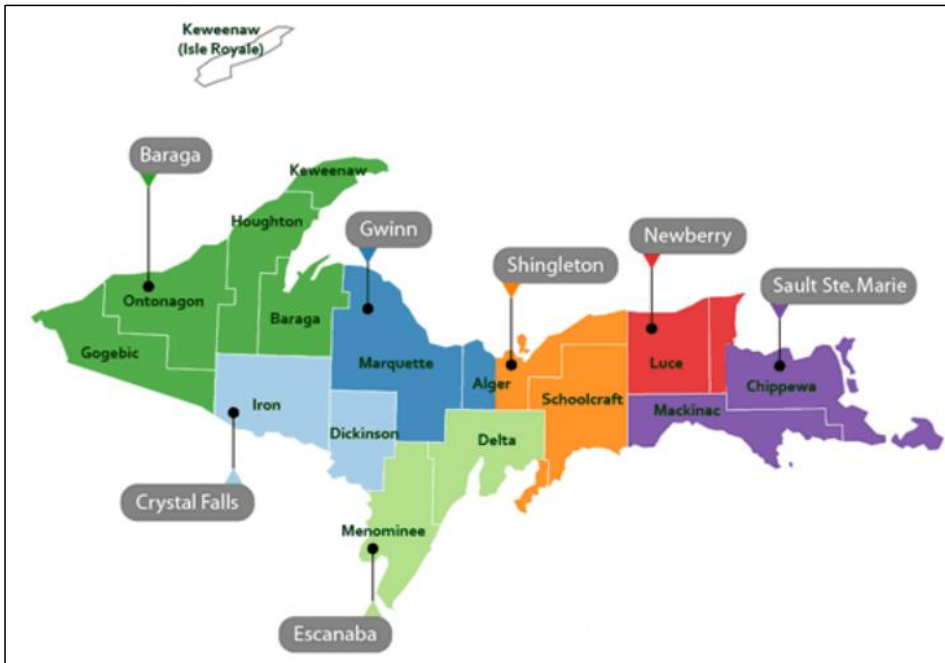
## Windigo Area



d) *Michigan Department of Natural Resources (DNR)*

Images courtesy Michigan Department of Natural Resources

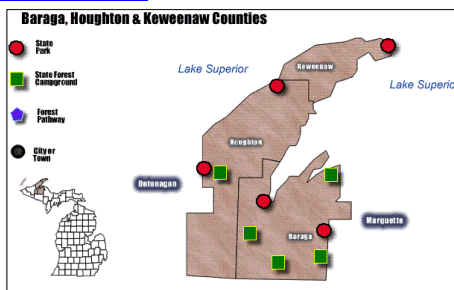
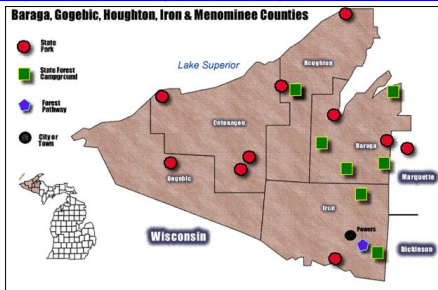
([http://www.michigan.gov/dnr/0,4570,7-153-30301\\_30505-66516--00.html](http://www.michigan.gov/dnr/0,4570,7-153-30301_30505-66516--00.html))

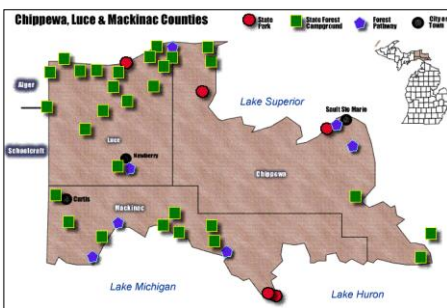
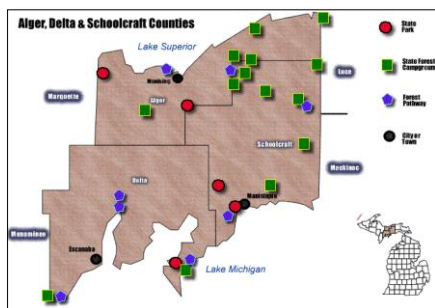
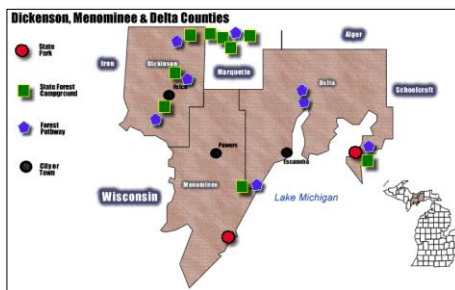
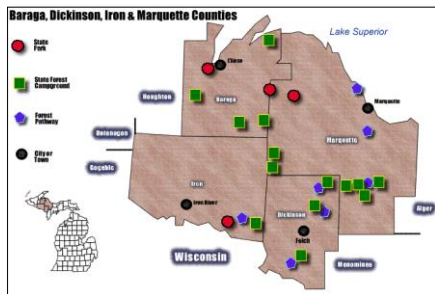


State Park, Forest Campground, and Pathways (by region)

<http://www.michigandnr.com/parksandtrails/parkmap.aspx>

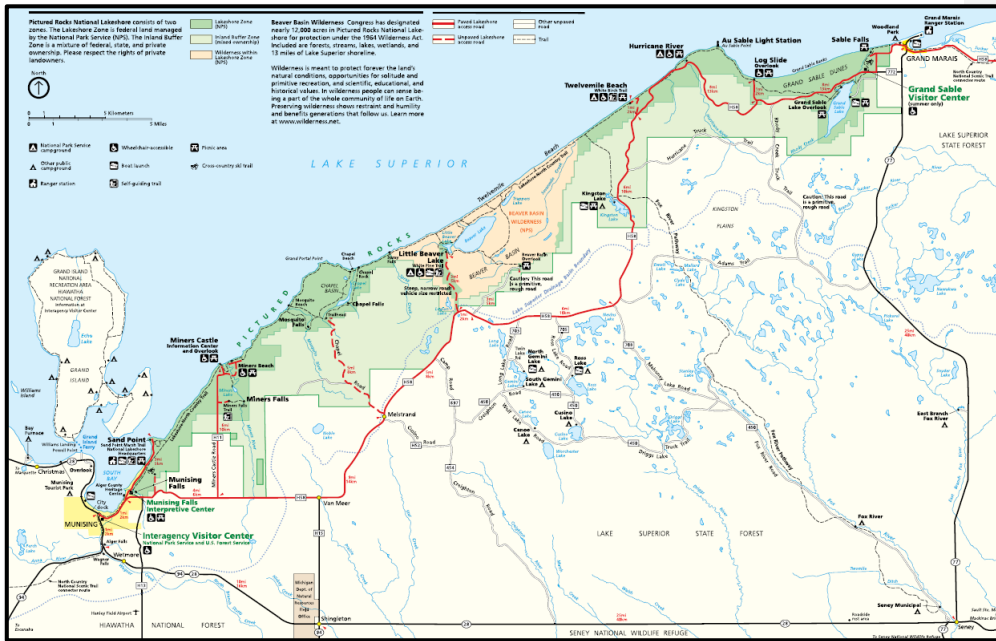
<http://www.michigandnr.com/parksandtrails/listing.aspx?list=parks>





e) *Pictured Rocks National Lakeshore, NPS*

Images courtesy Pictured Rocks National Lakeshore (<http://www.nps.gov/piro>)  
 Official Park Map and Guide (<http://www.nps.gov/piro/planyourvisit/brochures.htm>)



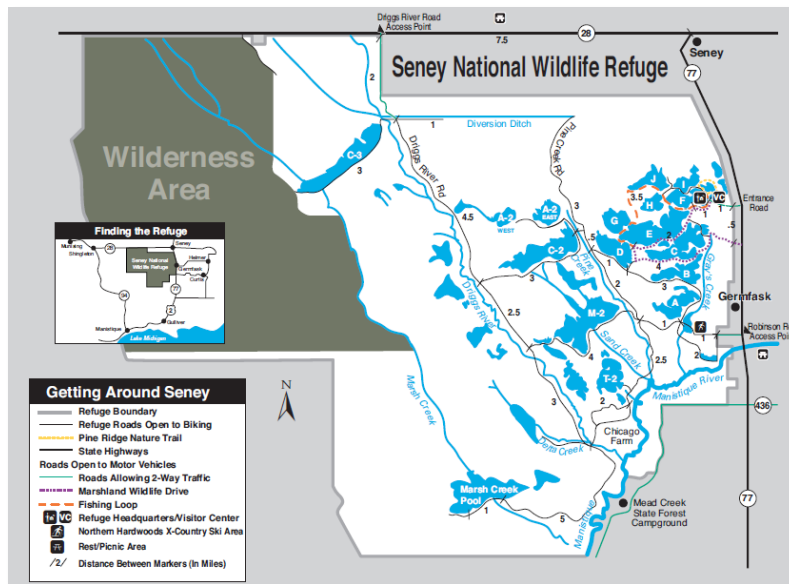


f) *Seney National Wildlife Refuge, USFW*

Seney National Wildlife Refuge also manages the following areas in the Marquette NWS forecast area ...

- **Harbor Island National Wildlife Refuge** – 695 acres one mile north of Drummond Island
- **West Huron Island lighthouse** – 3 miles off the southern shore of Lake Superior, 18 miles east of the Keweenaw Peninsula
- **Whitefish Point** (migratory bird reserve) – 33 acres adjacent to the Great Lakes Shipwreck Historical Museum

Image courtesy Seney National Wildlife Refuge (<http://www.fws.gov/uploadedFiles/snwrmap.pdf>)  
Land Cover Map [http://www.fws.gov/uploadedFiles/ctypesmap09\\_small.pdf#c](http://www.fws.gov/uploadedFiles/ctypesmap09_small.pdf#c)



### III. SERVICES PROVIDED BY THE NATIONAL WEATHER SERVICE

#### A. Fire weather products

##### 1. Fire Weather Planning Forecast (ARBFWMQT)

###### a) *Issuance (seasonal, daily)*

The National Weather Service in Marquette will produce the fire weather planning forecast during the fire season, which traditionally runs from April 15 to November 1. The start and end times are a collaboration between the National Weather Service and participating land management agencies. The forecast is then produced daily during the fire season, and is typically issued by 6 am local time. It will be updated during the day if significant differences are expected or occurring.

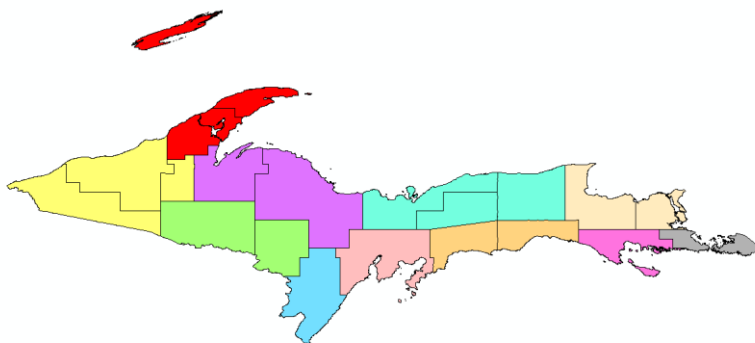
###### b) *Posting*

The primary way to receive our forecasts would be through our website, <http://www.weather.gov/mqt> and more specifically the Fire Weather link at the very bottom of our home webpage, below Forecasts (<https://www.weather.gov/mqt/fire>). Forecasts are also available through WIMS and GACC Predicted Service, if needed.

###### c) *Content*

This product usually has a set county/zone combination, which may be broken down further if certain headlines are issued (Wind Advisory, High Wind Warning, Fire Weather Watch, and/or Red Flag Warning). The current county/zone combination can be changed upon agency agreement. The forecast will include the next 3 weather periods in detail: today, tonight, and tomorrow. The following forecast example, for western Upper Michigan, is only a fraction of the entire forecast.

###### **County/Zone Combination:**





**Forecaster Note:** The FWF is created in GFE, under "FWF." If a NPW (Wind Advisory/High Wind Warning) or RFW (Red Flag Warning/Fire Weather Watch) have been issued, the formatter will automatically break out the appropriate counties. This will need to be double checked for Mackinac and Chippewa Counties.

FIRE WEATHER PLANNING FORECAST FOR UPPER MICHIGAN  
National Weather Service Marquette MI  
422 AM EDT Wed Jul 7 2021

...RAIN SHOWERS MOVING OUT OF THE AREA TODAY, DRY CONDITIONS  
WILL RETURN THROUGH THE WEEKEND...

.DISCUSSION:

Lingering light rain showers will occur today for the south central and southeast portions of Upper Michigan. Up to a quarter of an inch of rainfall is possible in the areas that see the rain showers continue. The surface low pressure system will move out of the area and be replaced by high pressure. This high pressure will keep the area dry through the weekend, and continue the trend of minimal fire weather concerns as well.

MIZ001-003-080830-  
Keweenaw-Northern Houghton-  
Including the cities of Copper Harbor, Houghton, and Hancock  
422 AM EDT Wed Jul 7 2021

.TODAY...

Sky/weather.....Mostly sunny.  
Max temperature.....59-64 inland to around 57 at the shore.  
24 hr trend.....Unchanged.  
Min humidity.....49-54 percent.  
24 hr trend.....15 percent drier.  
20-foot winds.....Northeast 9 to 14 mph.  
PCPN amount.....None.  
Hours of Sun.....11.  
LAL.....1.

.TONIGHT...

Sky/weather.....Clear.  
Min temperature.....46-51.  
24 hr trend.....Unchanged.  
Max humidity.....80-85 percent.  
24 hr trend.....5 percent drier.  
20-foot winds.....Northeast 7 to 12 mph shifting to the north 6  
to 11 mph late.  
PCPN amount.....None.  
LAL.....1.

.THURSDAY...

Sky/weather.....Sunny.  
Max temperature.....65-70 inland to around 61 at the shore.  
Min humidity.....49-54 percent inland to 58 percent at the shore.

NWS MQT Fire Weather Annual Operating Plan 2022

20-foot winds.....Northeast 7 to 12 mph.  
PCPN amount.....None.  
Hours of Sun.....13.  
LAL.....1.

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MIZ002-009-084-080830-  
Ontonagon-Gogebic-Southern Houghton-  
Including the cities of Ontonagon, Ironwood, Kenton, and Sidnaw  
422 AM EDT Wed Jul 7 2021 /322 AM CDT Wed Jul 7 2021/

.TODAY...  
Sky/weather.....Partly cloudy.  
Max temperature.....Around 62.  
24 hr trend.....Unchanged.  
Min humidity.....50-55 percent inland to 61 percent at the  
shore.  
24 hr trend.....23 percent drier.  
20-foot winds.....Northeast 8 to 13 mph with gusts to around 20  
mph.  
PCPN amount.....None.  
Hours of Sun.....7.  
LAL.....1.

.TONIGHT...  
Sky/weather.....Mostly clear.  
Min temperature.....42-47.  
24 hr trend.....5 degrees cooler.  
Max humidity.....87-92 percent inland to 82 percent at the  
shore.  
24 hr trend.....9 percent drier.  
20-foot winds.....Northeast 6 to 11 mph shifting to the east 4 to  
9 mph late.  
PCPN amount.....None.  
LAL.....1.

.THURSDAY...  
Sky/weather.....Mostly sunny.  
Max temperature.....Around 70 inland to around 60 at the shore.  
Min humidity.....43-48 percent inland to 54 percent at the  
shore.  
20-foot winds.....Northeast 7 to 12 mph.  
PCPN amount.....None.  
Hours of Sun.....12.  
LAL.....1.

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MIZ004-005-080830-  
Baraga-Marquette-  
Including the cities of L'Anse, Gwinn, and Marquette  
422 AM EDT Wed Jul 7 2021

.TODAY...  
Sky/weather.....Mostly cloudy. Isolated rain showers through  
early afternoon. Chance of showers 20 percent.  
Max temperature.....59-64.  
24 hr trend.....Unchanged.

Min humidity.....55-60 percent.  
24 hr trend.....10 percent drier.  
20-foot winds.....Northeast 8 to 13 mph. Gusts up to 20 mph  
through early afternoon.  
PCPN amount.....None to 0.07 inch.  
Hours of Sun.....6.  
LAL.....1.

.TONIGHT...  
Sky/weather.....Partly cloudy.  
Min temperature.....43-48 inland to around 50 at the shore.  
24 hr trend.....Unchanged.  
Max humidity.....80-85 percent.  
24 hr trend.....14 percent drier.  
20-foot winds.....Northeast 5 to 10 mph shifting to the north  
late.  
PCPN amount.....None.  
LAL.....1.

.THURSDAY...  
Sky/weather.....Mostly sunny.  
Max temperature.....Around 68 inland to around 61 at the shore.  
Min humidity.....46-51 percent inland to 56 percent at the  
shore.  
20-foot winds.....Northeast 5 to 10 mph.  
PCPN amount.....None.  
Hours of Sun.....11.  
LAL.....1.

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MIZ010-011-080830-  
Iron-Dickinson-  
Including the cities of Iron River and Iron Mountain  
322 AM CDT Wed Jul 7 2021

.TODAY...  
Sky/weather.....Mostly cloudy. Isolated rain showers. Chance of  
showers 20 percent.  
Max temperature.....Around 63.  
24 hr trend.....5 degrees cooler.  
Min humidity.....55-60 percent.  
24 hr trend.....21 percent drier.  
20-foot winds.....Northeast 6 to 11 mph. Gusts up to 20 mph  
through early afternoon.  
PCPN amount.....None to 0.15 inch.  
Hours of Sun.....4.  
LAL.....1.

.TONIGHT...  
Sky/weather.....Partly cloudy.  
Min temperature.....43-48.  
24 hr trend.....Unchanged.  
Max humidity.....84-89 percent.  
24 hr trend.....10 percent drier.  
20-foot winds.....Northeast 7 to 12 mph.  
PCPN amount.....None.  
LAL.....1.

.THURSDAY...

Sky/weather.....Mostly sunny.  
Max temperature.....Around 71.  
Min humidity.....43-48 percent.  
20-foot winds.....Northeast 5 to 10 mph.  
PCPN amount.....None.  
Hours of Sun.....10.  
LAL.....1.

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MIZ012-080830-  
Menominee-  
Including the city of Menominee  
322 AM CDT Wed Jul 7 2021

.TODAY...  
Sky/weather.....Cloudy. Numerous rain showers early, then  
scattered rain showers by late morning. Chance  
of showers 70 percent.  
Max temperature.....Around 62.  
24 hr trend.....15 degrees cooler.  
Min humidity.....70-75 percent.  
24 hr trend.....17 percent wetter.  
20-foot winds.....Northeast 8 to 13 mph with gusts to around 20  
mph.  
PCPN amount.....0.07-0.36 inch.  
Hours of Sun.....1.  
LAL.....1.

.TONIGHT...  
Sky/weather.....Mostly cloudy. Isolated rain showers. Chance of  
showers 20 percent.  
Min temperature.....Around 49.  
24 hr trend.....4 degrees cooler.  
Max humidity.....86-91 percent.  
24 hr trend.....11 percent drier.  
20-foot winds.....Northeast 6 to 11 mph. Gusts up to 20 mph  
through midnight.  
PCPN amount.....None to 0.06 inch.  
LAL.....1.

.THURSDAY...  
Sky/weather.....Partly cloudy.  
Max temperature.....Around 70.  
Min humidity.....45-50 percent inland to 58 percent at the  
shore.  
20-foot winds.....Northeast 7 to 12 mph decreasing to 6 to  
11 mph by mid afternoon. Gusts up to 20 mph.  
PCPN amount.....None.  
Hours of Sun.....9.  
LAL.....1.

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MIZ006-007-085-080830-  
Alger-Luce-Northern Schoolcraft-  
Including the cities of Grand Marais, Munising, Newberry,  
and Seney

422 AM EDT Wed Jul 7 2021

.TODAY...

Sky/weather.....Mostly cloudy. Isolated rain showers. Chance of  
showers 20 percent.

Max temperature.....Around 64 inland to around 57 at the shore.

24 hr trend.....Unchanged.

Min humidity.....60-65 percent.

24 hr trend.....6 percent drier.

20-foot winds.....Northeast 7 to 12 mph.

PCPN amount.....None to 0.06 inch.

Hours of Sun.....4.

LAL.....1.

.TONIGHT...

Sky/weather.....Partly cloudy. Isolated rain showers late.  
Chance of showers 20 percent.

Min temperature.....Around 48.

24 hr trend.....Unchanged.

Max humidity.....89-94 percent.

24 hr trend.....8 percent drier.

20-foot winds.....Northeast 7 to 12 mph.

PCPN amount.....None to 0.05 inch.

LAL.....1.

.THURSDAY...

Sky/weather.....Mostly sunny.

Max temperature.....Around 69 inland to around 59 at the shore.

Min humidity.....46-51 percent inland to 58 percent at the  
shore.

20-foot winds.....Northeast 5 to 10 mph.

PCPN amount.....None.

Hours of Sun.....10.

LAL.....1.

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MIZ013-080830-

Delta-

Including the cities of Escanaba and Gladstone

422 AM EDT Wed Jul 7 2021

.TODAY...

Sky/weather.....Cloudy. Scattered rain showers. Chance of  
showers 50 percent.

Max temperature.....Around 62.

24 hr trend.....7 degrees cooler.

Min humidity.....69-74 percent.

24 hr trend.....Unchanged.

20-foot winds.....Northeast 7 to 12 mph with gusts to around 20  
mph.

PCPN amount.....0.04-0.33 inch.

Hours of Sun.....1.

LAL.....1.

.TONIGHT...

Sky/weather.....Mostly cloudy. Isolated rain showers. Chance of  
showers 20 percent.

Min temperature.....Around 48 inland to around 54 at the shore.  
24 hr trend.....Unchanged.  
Max humidity.....87-92 percent.  
24 hr trend.....11 percent drier.  
20-foot winds.....Northeast 5 to 10 mph.  
PCPN amount.....None to 0.08 inch.  
LAL.....1.

.THURSDAY...  
Sky/weather.....Partly cloudy.  
Max temperature.....Around 69.  
Min humidity.....48-53 percent.  
20-foot winds.....Northeast 7 to 12 mph.  
PCPN amount.....None.  
Hours of Sun.....9.  
LAL.....1.

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MIZ014-095-080830-  
Southern Schoolcraft-Western Mackinac-  
Including the cities of Manistique and Engadine  
422 AM EDT Wed Jul 7 2021

.TODAY...  
Sky/weather.....Cloudy. Scattered rain showers. Chance of  
showers 50 percent.  
Max temperature.....Around 63.  
24 hr trend.....7 degrees cooler.  
Min humidity.....66-71 percent.  
24 hr trend.....4 percent wetter.  
20-foot winds.....East 8 to 13 mph with gusts to around 20 mph  
decreasing to 6 to 11 mph by mid afternoon.  
PCPN amount.....0.04-0.21 inch.  
Hours of Sun.....1.  
LAL.....1.

.TONIGHT...  
Sky/weather.....Mostly cloudy then becoming partly cloudy.  
Isolated rain showers. Chance of showers 20  
percent.  
Min temperature.....Around 50.  
24 hr trend.....Unchanged.  
Max humidity.....93-98 percent.  
24 hr trend.....5 percent drier.  
20-foot winds.....East 6 to 11 mph shifting to the northeast 7 to  
12 mph late.  
PCPN amount.....None to 0.09 inch.  
LAL.....1.

.THURSDAY...  
Sky/weather.....Partly cloudy.  
Max temperature.....Around 69.  
Min humidity.....48-53 percent.  
20-foot winds.....Northeast 6 to 11 mph. Gusts up to 20 mph  
through early afternoon.  
PCPN amount.....None.  
Hours of Sun.....9.

LAL.....1.

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MIZ096-097-080830-

Eastern Mackinac-Mackinac Island/Bois Blanc Island-  
Including the cities of St. Ignace and Mackinac Island  
422 AM EDT Wed Jul 7 2021

.TODAY...

Sky/weather.....Cloudy. Scattered rain showers. Chance of  
showers 50 percent.

Max temperature.....Around 61.

24 hr trend.....18 degrees cooler.

Min humidity.....71-76 percent.

24 hr trend.....17 percent wetter.

20-foot winds.....East 9 to 14 mph decreasing to 7 to 12 mph by  
mid afternoon.

PCPN amount.....0.06-0.35 inch.

Hours of Sun.....1.

LAL.....1.

.TONIGHT...

Sky/weather.....Mostly cloudy. Scattered rain showers. Chance  
of showers 50 percent.

Min temperature.....49-54.

24 hr trend.....Unchanged.

Max humidity.....93-98 percent.

24 hr trend.....4 percent drier.

20-foot winds.....East 6 to 11 mph shifting to the northeast 5 to  
10 mph with gusts to around 20 mph late.

PCPN amount.....0.07-0.19 inch.

LAL.....1.

.THURSDAY...

Sky/weather.....Partly cloudy. A slight chance of rain showers  
through early afternoon. Chance of showers 20  
percent.

Max temperature.....Around 66.

Min humidity.....52-57 percent.

20-foot winds.....Northeast 8 to 13 mph shifting to the  
east 6 to 11 mph by mid afternoon. Gusts up to  
20 mph.

PCPN amount.....None to 0.17 inch.

Hours of Sun.....7.

LAL.....1.

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MIZ088-080830-

Southeast Chippewa-  
Including the city of Drummond  
422 AM EDT Wed Jul 7 2021

.TODAY...

Sky/weather.....Cloudy. Scattered rain showers. Chance of  
showers 50 percent.

Max temperature.....Around 60.

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.THURSDAY...
Sky/weather.....Partly cloudy. A chance of rain showers. Chance
                  of showers 30 percent.
Max temperature.....Around 66.
Min humidity.....53-58 percent.
20-foot winds.....East 8 to 13 mph. Gusts up to 25 mph
                  through early afternoon.
PCPN amount.....0.11-0.17 inch.
Hours of Sun.....7.
LAL.....1.
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MIZ086-087-080830-  
Western Chippewa-Central Chippewa-  
Including the cities of Eckerman and Sault Ste. Marie  
422 AM EDT Wed Jul 7 2021

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.TODAY...
Sky/weather.....Mostly cloudy. Scattered rain showers. Chance
                  of showers 40 percent.
Max temperature....Around 63.
  24 hr trend.....11 degrees cooler.
Min humidity.....60-65 percent.
  24 hr trend.....Unchanged.
20-foot winds.....East 6 to 11 mph.
PCPN amount.....None to 0.06 inch.
Hours of Sun.....3.
LAL.....1.
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.TONIGHT...
Sky/weather.....Partly cloudy. Isolated rain showers. Chance of
                        showers 20 percent.
Min temperature.....Around 49.
24 hr trend.....Unchanged.
Max humidity.....92-97 percent.
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24 hr trend.....4 percent drier.  
 20-foot winds.....East 5 to 10 mph shifting to the northeast 6 to 11 mph late.  
 PCPN amount.....None to 0.08 inch.  
 LAL.....1.

.THURSDAY...  
 Sky/weather.....Mostly sunny. A slight chance of rain showers through early afternoon. Chance of showers 20 percent.  
 Max temperature.....Around 68.  
 Min humidity.....47-52 percent.  
 20-foot winds.....Northeast 6 to 11 mph with gusts to around 20 mph decreasing to 7 to 12 mph by mid afternoon.  
 PCPN amount.....None to 0.13 inch.  
 Hours of Sun.....10.  
 LAL.....1.

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.FORECAST DAYS 3 THROUGH 7...

.FRIDAY...Clear. Lows 45 to 50. Highs 74 to 79. Variable winds 5 mph or less.  
 .SATURDAY...Mostly clear. Lows 50 to 55. Highs around 79 inland to around 73 at the shore. Variable winds 5 mph or less.  
 .SUNDAY...Mostly clear. Lows around 53 inland to around 59 at the shore. Highs 77 to 82. Northeast 3 to 8 mph.  
 .MONDAY...Partly cloudy with a 30 percent chance of rain showers. Lows around 57 inland to around 63 at the shore. Highs 77 to 82 inland to around 74 at the shore.  
 .TUESDAY...Partly cloudy. A 20 percent chance of rain showers. Lows 57 to 62. Highs 79 to 84.

.Outlook for Wed Jul 14 through Tue Jul 20...expect above normal temperatures and near normal precipitation.

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.....Smoke Management Forecast data.....

The following values are for 1 PM EST (2 PM EDT) today:

WIMS ID/	Site/	Haines Index	Mixing / Height	Transport / Winds	Ventilation / Index
471301 /	WAUSAUKEE/	2 VERY LOW	/ 2200	/ NE 23	/ 506 (G)
200301 /	KENTON/	4 LOW	/ 3900	/ NE 16	/ 624 (E)
200504 /	BARAGA PLAINS/	5 MODERATE	/ 4500	/ NE 14	/ 630 (E)
201004 /	MUNISING/	3 VERY LOW	/ 600	/ E 10	/ 60 (P)
201002 /	DOE LAKE/	3 VERY LOW	/ 3700	/ E 10	/ 370 (G)
201103 /	HIGH BRIDGE/	3 VERY LOW	/ 3500	/ E 12	/ 420 (G)
200703 /	GWINN/	3 VERY LOW	/ 2900	/ NE 16	/ 464 (G)
200903 /	LABRANCHE/	3 VERY LOW	/ 3400	/ NE 16	/ 544 (G)
200503 /	PELKIE/	5 MODERATE	/ 4200	/ NE 17	/ 714 (E)
201504 /	RACO/	3 VERY LOW	/ 3000	/ E 11	/ 330 (G)
200802 /	RANDVILLE/	3 VERY LOW	/ 3700	/ NE 17	/ 629 (E)

201401	/	REXTON/	3	VERY LOW	/	2900	/	E 14	/	406	(G)		
201505	/	RUDYARD/	3	VERY LOW	/	3100	/	E 14	/	434	(G)		
201202	/	SENEY/	3	VERY LOW	/	4200	/	E 11	/	462	(G)		
201302	/	SPINCICH LAKE/	4	LOW	/	4000	/	E 11	/	440	(G)		
201102	/	STONINGTON/	3	VERY LOW	/	3500	/	E 16	/	560	(G)		
200102	/	WAKEFIELD/	5	MODERATE	/	4200	/	NE 14	/	588	(G)		
200103	/	WATERSMEET/	4	LOW	/	4000	/	NE 12	/	480	(G)		
		/DRUMND ISLAND/	2	VERY LOW	/	1400	/	E 17	/	238	(F)		
		/		KEW/	6	HIGH	/	3800	/	E 13	/	494	(G)

THE FOLLOWING VALUES ARE FOR 1 PM EST (2 PM EDT) Thu...

WIMS ID/	Site/	Haines Index	Mixing Height	Transport Winds	Ventilation Index		
471301	/ WAUSAUKEE/	4	LOW	/ 5300 / NE 11	/ 583 (G)		
200301	/ KENTON/	4	LOW	/ 5200 / NE 5	/ 260 (F)		
200504	/BARAGA PLAINS/	4	LOW	/ 5800 / NE 6	/ 348 (G)		
201004	/ MUNISING/	5	MODERATE	/ 2800 / NE 11	/ 308 (G)		
201002	/ DOE LAKE/	5	MODERATE	/ 4800 / NE 12	/ 576 (G)		
201103	/ HIGH BRIDGE/	5	MODERATE	/ 4800 / NE 13	/ 624 (E)		
200703	/ GWINN/	5	MODERATE	/ 4500 / NE 11	/ 495 (G)		
200903	/ LABRANCHE/	4	LOW	/ 5500 / NE 11	/ 605 (E)		
200503	/ PELKIE/	4	LOW	/ 5800 / NE 6	/ 348 (G)		
201504	/ RACO/	4	LOW	/ 4800 / NE 11	/ 528 (G)		
200802	/ RANDVILLE/	4	LOW	/ 6100 / NE 9	/ 549 (G)		
201401	/ REXTON/	4	LOW	/ 4800 / NE 11	/ 528 (G)		
201505	/ RUDYARD/	4	LOW	/ 5000 / NE 12	/ 600 (E)		
201202	/ SENEY/	5	MODERATE	/ 4900 / NE 13	/ 637 (E)		
201302	/SPINCICH LAKE/	5	MODERATE	/ 4800 / NE 13	/ 624 (E)		
201102	/ STONINGTON/	5	MODERATE	/ 5100 / NE 12	/ 612 (E)		
200102	/ WAKEFIELD/	4	LOW	/ 5600 / NE 3	/ 168 (F)		
200103	/ WATERSMEET/	4	LOW	/ 5800 / NE 5	/ 290 (F)		
	/DRUMND ISLAND/	3	VERY LOW	/ 4400 / NE 18	/ 792 (E)		
	/		KEW/	4	LOW	/ 4800 / E 5	/ 240 (F)

Note: Mixing heights are in feet above ground level  
Transport winds are in miles per hour

.....  
The following is point forecast information valid at 1 PM EST.  
Note that the QPF is from 7 AM to 1 PM EST. Also, wind speeds have  
been reduced by a factor of 0.7 by the request of local fire officials.

WIMS ID/	Site/Temp/	RH/WSPD/WGST/WDIR/	QPF
471301	/ WAUSAUKEE/	58/ 88/ 6/ 12/	NE/0.21
200301	/ KENTON/	62/ 53/ 8/ 11/	NE/0.00
200504	/BARAGA PLAINS/	63/ 55/ 7/ 10/	NE/0.00
201004	/ MUNISING/	59/ 72/ 7/ 9/	NE/0.01
201002	/ DOE LAKE/	62/ 68/ 5/ 8/	NE/0.02
201103	/ HIGH BRIDGE/	62/ 69/ 5/ 8/	E/0.04
200703	/ GWINN/	59/ 69/ 7/ 12/	NE/0.01
200903	/ LABRANCHE/	62/ 71/ 5/ 10/	NE/0.06
200503	/ PELKIE/	61/ 56/ 8/ 12/	NE/0.00
201504	/ RACO/	60/ 67/ 4/ 8/	E/0.02
200802	/ RANDVILLE/	61/ 68/ 6/ 11/	NE/0.03
201401	/ REXTON/	59/ 73/ 5/ 9/	E/0.04

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201505 / RUDYARD/ 60/ 69/ 6/ 9/ E/0.04
201202 / SENEY/ 63/ 65/ 5/ 8/ E/0.02
201302 /SPINCICH LAKE/ 61/ 65/ 5/ 8/ E/0.01
201102 / STONINGTON/ 61/ 76/ 5/ 9/ NE/0.09
200102 / WAKEFIELD/ 62/ 53/ 7/ 10/ NE/0.00
200103 / WATERSMEET/ 61/ 57/ 6/ 9/ NE/0.00
/DRUMND ISLAND/ 57/ 77/ 7/ 12/ E/0.06
/ KEW/ 60/ 57/ 8/ 11/ E/0.00

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BW

Time of issuance is located in the header of the product and is given in local time.

A headline is usually added, which describes the most important features of the period. If a Red Flag Warning or Fire Weather Watch is in effect, mentions should be included within the headline. Additional information behind the reason, time frame, and areal coverage will be covered in the discussion.

Example:

...RED FLAG WARNING TODAY FOR SOUTH CENTRAL UPPER MICHIGAN INCLUDING PORTIONS OF THE OTTAWA NATIONAL FOREST FOR LOW HUMIDITY AND STRONG WIND...

.DISCUSSION...

The discussion is a brief synopsis of the current conditions and what can be expected over the next 2 days, but may extend farther out if conditions are expected to significantly influence fire operations. It will include the mention of major weather features expected to affect the forecast area, along with any fire weather specific concerns of low humidity, high winds, high temperatures, or significant frost. We will make every effort to not use the phrases "near red flag conditions" or "fire danger," as this may create confusion. The discussion should be 8 lines or less, unless extreme fire weather deems otherwise.

SKY/WEATHER

The prevailing sky conditions across the area, given as Clear, Sunny, Mostly Sunny, Partly Cloudy, Partly Sunny, Mostly Cloudy, or Cloudy. There is a wide variety of weather options including a chance of rain showers, or a chance of showers and thunderstorms.

The chance of precipitation ranges from 0 to 100 percent. This value indicates the percent probability that any one location will receive measurable rain of 0.01 inches or greater.

0 - 14%	=	None, unless flurries, sprinkles, or drizzle
15 - 29%	=	Slight chance or isolated
30 - 59%	=	Chance or scattered
60 - 79%	=	Likely or numerous
80 - 100%	=	Definite

MAX/MIN TEMPERATURE  
24 HOUR TREND

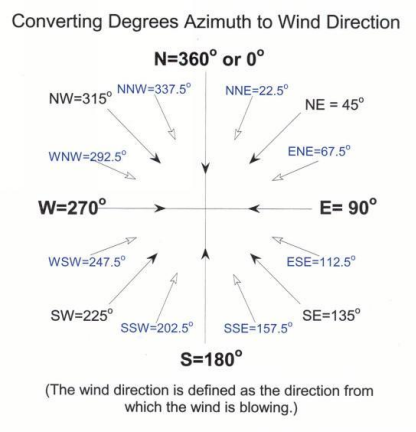
Maximum and minimum temperatures are forecast in degrees Fahrenheit. Maximum temperatures will be given during the daytime hours, and minimum temperatures for the overnight. 24 Hour Trend is a value, positive or negative, depicting the difference between the maximum or minimum temperatures of the previous day to those expected that period.

#### MAX/MIN HUMIDITY 24 HR TREND

The relative humidity is the ratio, in percent, of the amount of moisture in the air compared to the amount the air could hold if it were fully saturated (100%). Maximum values are given for the overnight periods, while minimum values are for the daytime hours.

#### AIRPORT WINDS

This value is a combination of wind direction and speed in mph. Significant gusts or erratic wind speed or direction changes will be included. Direction is given in the 8 cardinal points; the direction from which the wind is blowing. The 8 cardinal points are N, NE, E, SE, S, SW, W, and NW. Wind speed is given in miles per hour. The National Weather Service directive 10-401: Fire Weather Services Product Specification states, "Wind will be derived from the local surface wind grid which approximates the 20 foot, 10 minute average." Due to land cover and specific location, a correction factor may be needed to get the 20-foot (\*0.7 is standard for the table below), mid flame, or other wind value of interest.



MI DNR / US BEHAVE Wind speed & Fire Shape

WIND ADJUSTMENT TABLE				MIDFLAME WINDSPEED					
Airport Winds (mph)		Fire Weather Obs		Unsheltered Fuels			Partial Shelter	Fully Sheltered	
		10m	20ft	FM 4	FM 13	Others		Open	Dense
1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
1	1	1	1	1	1	0	0	0	0
2	2	2	1	1	1	1	1	0	0
3	3	2	2	2	2	1	1	1	0
4	4	3	3	2	2	2	1	1	0
5	5	4	4	3	3	2	2	1	1
6	5	5	4	4	3	2	2	1	1
7	6	6	5	4	4	3	2	1	1

8	7	6	6	5	4	3	2	2	1
9	8	7	6	5	5	4	3	2	1
10	9	8	7	6	5	4	3	2	1
11	10	9	8	7	6	4	3	2	1
12	11	10	8	7	6	5	4	2	1
13	12	10	9	8	7	5	4	3	1
14	13	11	10	8	7	6	4	3	1
15	14	12	11	9	8	6	5	3	2
16	14	13	11	10	8	6	5	3	2
17	15	14	12	10	9	7	5	3	2
18	16	14	13	11	9	7	5	4	2
19	17	15	13	11	10	8	6	4	2
20	18	16	14	12	10	8	6	4	2
21	19	17	15	13	11	8	6	4	2
22	20	18	15	13	11	9	7	4	2
23	21	18	16	14	12	9	7	5	2
24	22	19	17	14	12	10	7	5	2
25	23	20	18	15	13	10	8	5	3
26	23	21	18	16	13	10	8	5	3
27	24	22	19	16	14	11	8	5	3
28	25	22	20	17	14	11	8	6	3
29	26	23	20	17	15	12	9	6	3
30	27	24	21	18	15	12	9	6	3
40	36	32	28	24	20	16	12	8	4
50	45	40	35	30	25	20	15	10	5

1. No Wind Adjustment Downhill at night.
2. Generally, NWS wind forecasts are based on winds recorded at airports. These sites are usually much more exposed than our fire weather recording stations.
3. Eye level winds are the most appropriate to use in making fire behavior predictions in the US BEHAVE system. However, RAWs record windspeeds at 20 ft. If you are using a NWS forecast product, or obtaining wind readings from a mast at 10m or 20ft at one of your fire weather sites, the eye level winds may be estimated from the chart above.

MI DNR CCFDRS Wind Speed & Fire Shape

Airport Winds (mph)	Fire Weather Obs Windspeed, mph		Eye Level Windspeed, mph		Fire Shape Length:Width	
	10m	20ft	Unsheltered	Sheltered	Unshelt.	Shelt.
1.0	0.8	0.7	0.5	0.3	O1a, O1b	C,M,D,S
1	1	1	1	0	1.4	1.0
2	2	1	1	1	1.4	1.0

3	2	2	2	1	1.4	1.0
4	3	3	2	1	2.3	1.1
5	4	4	3	2	2.6	1.2
6	5	4	3	2	2.9	1.3
7	6	5	4	2	3.2	1.4
8	6	6	4	2	3.2	1.4
9	7	6	5	3	3.4	1.6
10	8	7	5	3	3.6	1.8
11	9	8	6	3	3.8	1.9
12	10	8	6	4	4.0	2.1
13	10	9	7	4	4.0	2.1
14	11	10	7	4	4.2	2.3
15	12	11	8	5	4.4	2.5
16	13	11	8	5	4.5	2.7
17	14	12	9	5	4.6	2.9
18	14	13	9	5	4.7	2.9
19	15	13	10	6	4.8	3.1
20	16	14	10	6	5.0	3.3
21	17	15	11	6	5.1	3.5
22	18	15	11	7	5.2	3.7
23	18	16	12	7	5.2	3.7
24	19	17	12	7	5.4	3.9
25	20	18	13	8	5.5	4.1
26	21	18	13	8	5.6	4.3
27	22	19	14	8	5.8	4.5
28	22	20	14	8	5.8	4.5
29	23	20	15	9	5.9	4.7
30	24	21	15	9	6.0	4.9
40	32	28	20	12	6.3	5.4
50	40	35	25	15	6.9	6.4

Generally, NWS wind forecasts are based on winds recorded at airports. These sites are usually much more exposed than RAWs.

**10 m** winds are the most appropriate to use in determining Initial Spread Index (ISI) and making fire behavior predictions. However, our fire weather recording stations record windspeeds at **20 ft**. If you are taking eye level winds, working with a NWS forecast product, or obtaining 20 ft readings from our fire weather sites, the 10 m winds may be estimated from the chart above.

#### PCPN AMOUNT

Precipitation amount is given in hundredths of an inch (in), and is the average amount expected when precipitation is forecast. When the chance of precipitation is 14% or less a value of 0 will be given. At values at or above 15%, a range of probably values is given (example 0.12 to 0.25 in). A chance of precipitation (up to 60%) may also begin with a range of no precipitation, at the discretion of the forecasters (example, None to 0.12 in). This may be appropriate when spotty showers are expected or event uncertainty is high.

#### LAL

LAL or Lightning Activity Level describes the intensity or frequency of thunderstorms if forecast, otherwise a value of 1 is given. Since the objective is to describe the lightning activity, lightning counts take precedence over the cloud-storm-rain narrative descriptions. For instance, if the clouds fit the LAL 3 descriptive criteria, but the lightning average 3 cloud-to-ground discharges per minute, the LAL should be classified as a 4.

<i>Lightning Activity Level Values</i>		
	<i>Cloud and Storm Development</i>	<i>Cloud to Ground Lightning Strikes 5 min (15 min)...areal coverage</i>
1	No Thunderstorms	None...0%
2	Cumulus clouds are common but only a few reach the towering cumulus stage. Light rain will occasionally reach the ground. Lightning is very infrequent.	1-5 (1-8)...1-14%
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	6-10 (9-15)...15-24%
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered. Moderate rain is common and lightning is frequent.	11-15 (16-25)...25-54%
5	Towering cumulus and thunderstorms are numerous, covering more than three-tenths of the sky. Rain is moderate to heavy, with frequent and intense lightning.	>15 (>25)...>54%
6	Similar to LAL 3 except thunderstorms are dry.	

#### **.FORECAST DAYS 3 THROUGH 7...**

This portion of the forecast will contain general temperatures, sky conditions, and precipitation expected through the remainder of the 7 day forecast period. Wind direction and speed will be included through day 5, with gusts added when they are significant (typically over 35 mph).

#### **.OUTLOOK FOR 8 TO 14 DAYS...**

This extended outlook is taken directly from the daily forecast produced by the Climate Prediction Center, <http://www.cpc.ncep.noaa.gov/products/predictions/814day/> . It includes temperature and precipitation probabilities compared to seasonal normal values for the time periods. Values of near normal, above normal, or below normal will be given.

#### **.....SMOKE MANAGEMENT FORECAST DATA.....**

This section includes the 1 pm EST (2 pm EDT) Haines Index, Mixing Height, Transport Winds, and Ventilation Index for different RAWs sites for current day and the next day (day 2).

#### **HAINEX INDEX**

Haines Index is the sum of a stability term and a moisture term. The sum provides an indication of the potential for wildfire growth and extreme behavior of a fire on a given day. A Haines Index of 2-3= Very Low, 4= Low, 5=Moderate, and 6= High. We use the low-elevation formula, which is as follows:

<i>Stability Term</i> (T950-T850)	<i>Moisture Term</i> (T850-Td850)
-----------------------------------	-----------------------------------

1...3 C or less	1...5 C or less
2...4 to 17 C	2...6 to 9 C
3...8 C or greater	3...10 C or greater

#### MIXING HEIGHT

The mixing height is the depth of the unstable air in the boundary layer and is used for forecasting smoke or pollutant trajectories, in feet above ground level (FT-AGL). In other words, it's the layer in the atmosphere from the surface to the first inversion layer. This is the layer where vigorous mixing occurs due to convection. Quite variable in space and time, the mixed-layer depth typically increases during fair-weather daytime over land from tens of meters (around a hundred feet or less) shortly after sunrise to 1-4 km (about 3,000 to 13,000 feet) before sunset, depending on the location and season.

**Forecaster Note:** The Miller-Holzworth can be employed to calculate mixing height, but is a very basic, and assumes stability is based only on solar insolation, and does not take into account any changes in airmass during the day. Subsidence inversions, precipitation (non dry adiabatic parcel ascent), and upward vertical motion will usually result in different values. To estimate morning mixing heights, add 5 degrees C to the minimum surface temperature. Then follow the dry adiabat to the intersection of the 12Z sounding. The height above the ground is the predicted morning height. Afternoon mixing heights can be forecast in much the same manner. The predicted maximum temperature is followed up the dry adiabat to the intersection of the 12Z sounding. This level is the forecast of the afternoon mixing height.

#### TRANSPORT WIND

Transport wind is defined as the average wind speed in all directions of all winds within the layer bounded by the surface and the mixing height. Transport winds provide land managers with information about the horizontal dispersion (location and distance downwind from the source) or suspended particles from prescribed fires.

#### VENTILATION INDEX

Smoke dispersal improves as the mixed layer and transport wind increase. A derived value used to indicate smoke dispersal is the ventilation index, which may also be called the clearing index:

Ventilation Index = {mixing height (ft agl)\*transport winds (mph)}/ 100

Value		Rating
Less than 130	=	Poor (P)
130 – 299	=	Fair (F)
300 – 599	=	Good (G)
600 +	=	Excellent (E)



THE FOLLOWING IS POINT FORECAST INFORMATION VALID AT 1 PM EST.

The Point Forecast includes TEMP (temperature), RH (relative humidity), WSPD (wind speed), WDIR (wind direction), and QPF (quantitative precipitation forecasts). These forecasts are valid for each RAWS site at 1 pm EST (2 pm EDT).

## 2. Conference Calls & Weekly Webinars

NWS Marquette and the Michigan Interagency Wildland Fire Protection Association (MIWFPA) will hold a weekly webinars coordination calls will be hosted by NWS Marquette during fire weather season. The day and time of these webinars are flexible, and may be changed as needed from year to year. The webinar coordination call will be used to coordinate current and expected weather, status of fuels, and the potential need for any Fire Weather Watches over the upcoming week. The NWS will typically start off the call, followed by a discussion by MIWFPA agencies about available fuels, fire behavior, and resources. Weekly webinars will likely take place through spring green up and during any prolonged dry periods through the fire weather season. Depending upon the current fire weather conditions, additional conference calls may be needed during the week do discuss event-driven impacts and/or headlines.

NWS Webinar Software: Fire Weather FP will make sure partners have a link to the weekly webinars.

NWS MQT conference call number to be used for event-driven headline coordination calls:

866-231-8384 (participant code 9064755212)  
(leader pin 9743)

### Forecaster Note:

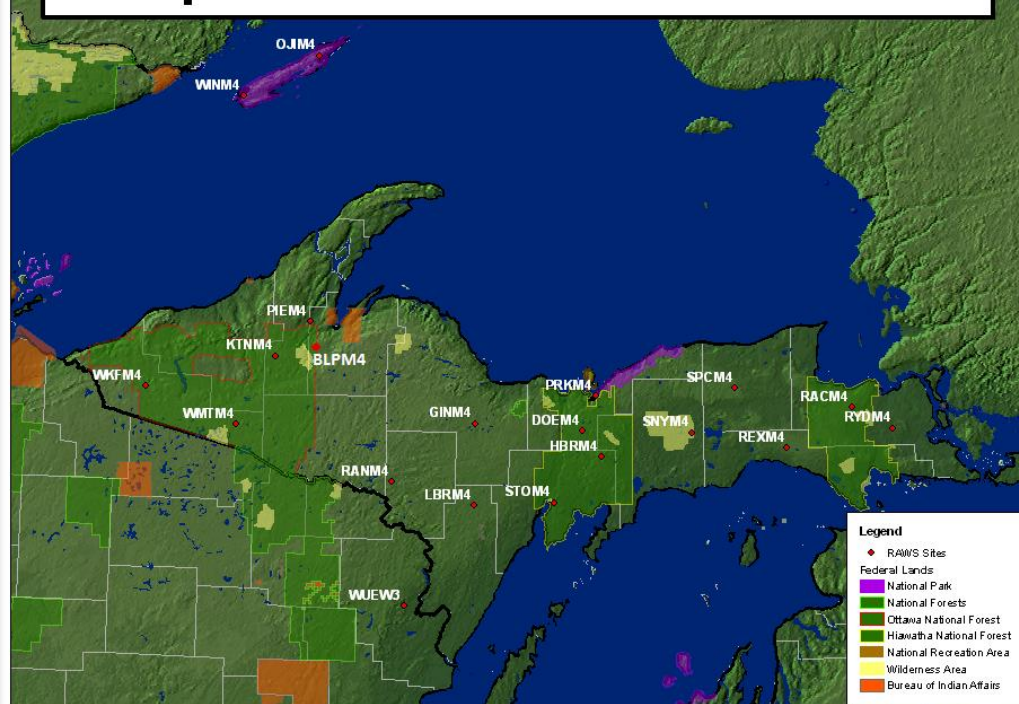
The forecaster working the short term desk (I shift) will typically participate in the call. Do not give the phone number/code to anybody other than MIWFPA shareholders or the EACC Meteorologist. GoToMeeting or GoToWebinar may be used, with webinar instructions are found off the local Google Site.

### 3. Fire Weather Matrix (ARBFWMMQT) for National Fire Danger Rating System

The Fire Weather Matrix is a part of the The National Fire Danger Rating System (NFDRS). NFDRS evaluates complex model and fuel parameters as a quantitative means for evaluating the fire danger across a vast area such as a forest. The input values include daily weather observations, fuel moisture, and our Fire Weather Matrix. Fire managers receive numeric output that suggests the severity of fire danger over a large area.

Station Name (NFDRS Zone)	Station ID#	County	Controlling Agency	Elevation (ft)
Windigo/WINM4 (951)	200403	Keweenaw	NPS	830
Ojibway/OJIM4 (951)	200405	Keweenaw	NPS	1040
Motts Island	200401	Keweenaw	NPS	602
Wakefield/WKFM4 (952)	200102	Gogebic	MDNRE	1200
Watersmeet/WMTM4 (951)	200103	Gogebic	USFS	1605
Kenton/KNTM4	200301	Houghton	USFS	1262
Pelkie/PIEM4 (None)	200503	Baraga	MDNRE	1000
Baraga Plains/BLPM4	200504	Baraga	USFS	1269
Randville/RANM4 (951)	200802	Dickinson	MDNRE	1255
Gwinn/GINM4 (950)	200703	Marquette	MDNRE	1225
Labranche/LBRM4 (None)	200903	Menominee	MDNRE	1000
Doe Lake/DOEM4 (950)	201002	Alger	USFS	815
Munising/PRKM4	201004	Alger	NPS	771
Stonington/STOM4 (949)	201102	Delta	USFS	653
High Bridge/HBRM4 (949)	201103	Delta	USFS	759
Seney/SNYM4 (950)	201202	Schoolcraft	USFWS	702
Spincich Lake/SPCM4 (951)	201302	Luce	MDNRE	896
Rexton/REXM4 (None)	201401	Mackinac	MDNRE	862
Raco/RACM4 (948)	201504	Chippewa	USFS	900
Rudyard/RYDM4 (None)	201505	Chippewa	MDNRE	700

## Marquette WFO Fire Weather Sites



### a) *Issuance (seasonal, daily)*

The FWM, or Fire Weather Matrix point forecast product, is produced on a seasonal basis, similar to the Fire Weather Planning Forecast. This coded forecast is produced for all 18 NFDRS RAWS sites in the forecast area (plus Mott Island, 200401) on a routine basis. Additional sites may be added upon request to the fire weather focal point.

In 2011, the Fire Agencies implemented a combined automated and manual observation issuance system, using what is known as the Nelson model. This results in a new observation type, "N or R" and indicates that the Nelson model was used in determining 1-hour and 10-hour fuel moisture. Though several Nelson model observations are generated, only the final "N or R" type observation is stored for the 1300 LST observation. Several N-model calculations are performed to generate automated State of Weather (SOW) and Wet Flag. A user can at this point manually edit the SOW and Wet Flag values based on local knowledge. In this case, the observation is recalculated, and the type of observation becomes "O" to indicate user editing. The manual editing of SOW and Wet Flag is the key difference, along with automatic availability of the "N or R" observation type.

Starting in spring of 2020, the Fire Weather Matrix will be a 7-day product. This is in support of 2016 NFDRS upgrades.

**Forecaster Note:** The FWM is created in the GFE Formatter Launcher, “FWM,” after the necessary grids have been published/finalized. Check the latest observations, and make necessary changes to max/min temperature, relative humidity, and in extreme occasions the Wet Flag values. Add hours of precipitation by hand if needed. Click Transmit to send the point forecasts after editing the forecast values.

#### b) Content

FNUS83 KMQT 261945																			
FWMMQT																			
FCST,	200103,	030127,	13,	2,	17,	92,	1,	1,	NW,	10,	M,	18,	10,	98,	56,	1,	0,	N	
FCST,	Station,	Date,	13,	Wx,	T,	RH,	L1,	L2,	WD,	WS,	M,	TM,	TN,	HM,	HN,	P1,	P2,	N	

Decoding the FWM (Fire Weather Matrix)

NOTE: All times are given in Eastern Standard/Daylight time. Adjust as needed for Central Time zone.

**Station** – NFDRS station number (starts with 20, indicating Michigan)

**Date** – ddhhmm (day, hour, minute)

**13** – indicates that the forecast is valid at 1300 LST (18Z), this is a constant

**Wx** – state of weather given as a value of 0 through 9, at 18Z (1 pm EST / 2 pm EDT) tomorrow.

0	= Clear sky
1	= Scattered clouds
2	= Broken clouds
3	= Cloudy
4	= Fog
5	= Drizzle
6	= Rain
7	= Snow/sleet
8	= Showers
9	= Thunderstorms

**T** – temperature at 18Z (1 pm EST / 2 pm EDT) tomorrow (°F)

**RH** – relative humidity at 18Z (1 pm EST / 2 pm EDT) tomorrow (%)

**L1** – lightning activity level from 19Z today to 04Z tonight; 2 pm EST (3 pm EDT) to 11 pm EST (midnight EDT)

**L2** – lightning activity level for 24 hours, from 04Z tonight until 04Z tomorrow night; 11 pm EST (midnight EDT) to 11 pm EST (midnight EDT)

#### Lightning Activity Level Guide (Coverage)

1	= No T-storms
2	= Isolated T-storms (1-14% coverage)
3	= Widely Scattered T-Storms (15-24% coverage)
4	= Scattered T-storms (25-54% coverage)
5	= Numerous (55+% coverage)
6	= Dry Lightning, when >=15% coverage

and little or no rain

**WD** – wind direction at 18Z (1 pm EST / 2 pm EDT) tomorrow, using a 16-point compass (N, NNE, NE...)

**WS** – wind speed at 18Z (1 pm EST / 2 pm EDT) tomorrow (mph)

**M** – Missing, constant M given in place of forecast fuel moisture

**TM** – maximum temperature from 18Z (1 pm EST / 2 pm EDT) today until 18Z (1 pm EST / 2 pm EDT) tomorrow (°F)

**TN** – minimum temperature from 18Z (1 pm EST / 2 pm EDT) today to 18Z (1 pm EST / 2 pm EDT) tomorrow (°F)

**HM** – maximum humidity from 18Z (1 pm EST / 2 pm EDT) today to 18Z (1 pm EST / 2 pm EDT) tomorrow (%)

**HN** – minimum humidity from 18Z (1 pm EST / 2 pm EDT) today to 18Z (1 pm EST / 2 pm EDT) tomorrow (%)

**P1** – hours of precipitation from 18Z (1 pm EST / 2 pm EDT) today until 10Z (500 am EST / 6 am EDT) tomorrow

**P2** – hours of precipitation from 10Z (5 am EST / 6 am EDT) tomorrow until 18Z (1 pm EST / 2 pm EDT) tomorrow

**WF** – wet flag is used to indicate if fuels will be wet at 18Z tomorrow (1 pm EST / 2 pm EDT), and is given as Y or N. If Y is used, then all indices will be forced to zero. N is most common. A 75% or greater probability of precipitation at 18Z tomorrow (1 pm EST / 2 pm EDT) will result in a Y.

*c) WIMS ID contact*

All fire weather stations have been assigned numbers to be used as the identification number when entering into the Weather Information Management System (WIMS). If a new station is established, or a present station is moved, a new identification number should be requested from the Eastern Area GACC Meteorologist, in coordination with WIMS and the National Weather Service.

#### 4. Site-specific wildland fire forecasts (Spot)

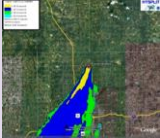

Spot Forecasts are issued when requested by Interagency Wildland Fire Agencies for wildland fires or planned burn operations and are available 24 hours a day. They differ from our routine fire weather forecasts by incorporating greater detail in timing, higher resolution of terrain influences, as well as meso-scale and sometimes micro-scale weather influences impacting the site.

A Spot Forecast may also be requested for non-fire incidents or events. Examples would include search and rescue, HAZMAT, or other situation where the information would be critical to public safety. The request must be made by a government or contract government official (federal, state, tribal, or local).

A HYSPLIT trajectory run can be created for smoke by adding the words HYSPLIT and then an email address for the run to be sent to.

Example: Hysplit [email.address@user.gov](mailto:email.address@user.gov)

Dispersion runs can be generated by calling the NWS MQT office. While this may be more helpful for shorter-term burns, they can still only be generated for fires (Rx or wildfires) of 50 acres or more. Contact the fire weather focal point for more information.

	Dispersion Model	Trajectory Model (Experimental)
Description	Forecasts the evolution of a smoke/chemical plume over time and space 	Forecasts where a parcel would travel from a given point starting at a specific elevation 
Needed Information	Additional Information required (burn size, duration, email)	All gathered from spot request
Request Method	Phone	Spot Forecast Request
Produced by	NWS forecaster	Automated
Delivery Method	Email	Email
Return Time	Up to ½ hour	Few Minutes

##### a) Criteria

Before we issue a forecast for a particular site, we need detailed information about the site, who is making the request, and why. Some of these site details include elevation, latitude, longitude, and aspect. The more information we receive about a burn site, the more accurate our forecasts tend to be. Current weather information is of great benefit if available, including temperature, wind speed, and relative

humidity. We will also need to know the requesting agency, project name, phone number, and effective time for the requested forecast. The turnaround time between the request and forecast issuance is typically between 30 and 40 minutes.

**Forecaster Note:** If the online NWSpot program is down, complete requests using Form D-1 (located on the NWS MQT Fire webpage). If a spot forecast is completed using the D-1 form, make a note in the shift log and place a hard copy in mailbox of the fire weather focal point.

To compose a Spot Forecast, create/update any appropriate grids. Use the Formatter Launcher in GFE, and select FWS from the *Products* menu. After clicking the *Run Formatter* button, select the spot request. Fill in the appropriate boxes pertaining to the request, and click *OK*. Edit the spot forecast as needed, paying special attention local weather features and how they relate to any available observations. Large ranges are of little help to the user, so try to be as specific as possible. Be sure to address specific questions that came in with the request, either in the synopsis or elsewhere. Do not use the term "Red Flag" within the Spot Forecast or any other text products unless a Red Flag Warning is in effect!

Once completed, the Spot Forecast will be relayed back to the requesting agency via the NWSPOT program.

#### **b) Content**

A Spot Forecast traditionally contains sky conditions, weather, temperature, relative humidity, and wind speed.

Optional Spot Forecast elements include...

- Sky/Weather
- Temperature
- Relative Humidity
- General Wind (**Note: The 20-ft and 33-ft winds are provided within the Spot Forecast**)
- Haines Index
- Smoke Dispersion (Transport Winds and Ventilation Index)
- Lightning Activity Level
- Mixing Height
- Wind Wave
- Rainfall Amount
- Additional information upon request

Today	Tonight	Thursday		Select All Periods
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sky/Weather	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Humidity	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rainfall Amount	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lightning Activity Level	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General Winds	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mixing Height	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Haines Index	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wave Height	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Smoke Dispersal	<input type="checkbox"/>

All parameters, excluding Dispersion and Wind Wave, are discussed in length in the Fire Weather Planning Forecast section of this Annual Operating Plan.

#### DISPERSION

Clicking on the option for dispersion will result in the following 2 parameters, Transport Winds and Ventilation Index. The Ventilation Index was discussed in the Fire Weather Planning Forecast section. The Transport Wind is the average wind speed and direction in the mixed layer.

#### WIND WAVE

Wind Wave is the wave height in feet (ft). This parameter is, in our case, available over most of Lake Superior and northern Lake Michigan. It is especially important for search-and-rescue, spills, incidents, or near water fire operations.

```
IF CONDITIONS BECOME UNREPRESENTATIVE,
CONTACT THE NATIONAL WEATHER SERVICE.
SPOT FORECAST FOR TEST LOCATION...MI DNR
NATIONAL WEATHER SERVICE MARQUETTE MI
1019 AM EDT TUE APR 12 2011

FORECAST IS BASED ON IGNITION TIME OF 1100 EDT ON APRIL 12.
IF CONDITIONS BECOME UNREPRESENTATIVE...CONTACT THE NATIONAL WEATHER
SERVICE.

.DISCUSSION...LOW PRESSURE OVER SOUTHEAST CANADA WILL MAINTAIN A
COOL NORTHWEST FLOW THROUGH WEDNESDAY. EXPECT NORTHWEST WINDS
GENERALLY IN THE 10 TO 15 MPH RANGE TODAY WITH GUSTS OCCASIONALLY
INTO THE 20 TO 25 MPH RANGE. LOOK FOR INCREASING CLOUD COVER THROUGH
THE DAY. A LOW PRESSURE TROUGH MOVING THROUGH THE AREA TONIGHT MAY
BRING A FEW SPRINKLES. ANOTHER TROUGH ON WEDNESDAY WILL BRING A
CHANCE OF A FEW LIGHT SHOWERS. HIGH PRESSURE WILL THEN BUILD INTO THE
REGION THROUGH THE END OF THE WEEK...BRINGING A WARMING TREND WITH
NO PRECIPITATION.

.TODAY...

SKY/WEATHER.....MOSTLY SUNNY THEN BECOMING MOSTLY CLOUDY.
```



```

MAX TEMPERATURE.....53 AT IGNITION...MAX 58.
MIN HUMIDITY.....42 PERCENT AT IGNITION...MIN 37 PERCENT.
GENERAL WIND.....WINDS NORTHWEST AT 11 MPH AT IGNITION...
                   OTHERWISE NORTH WINDS 7 TO 12 MPH INCREASING
                   TO NORTHWEST 10 TO 15 MPH.
HAINES INDEX.....4...OR LOW POTENTIAL FOR LARGE PLUME DOMINATED
                   FIRE GROWTH.
TRANSPORT WINDS.....NORTHWEST 16 TO 35 MPH INCREASING TO 24 TO 40
                   MPH LATE.
VENTILATION INDEX...GOOD (350) INCREASING TO EXCELLENT (2099).
LAL.....1.
MIXING HEIGHT.....300-1800 FT AGL INCREASING TO 7500-8000 FT AGL.
RAINFALL AMOUNT.....0.00 INCHES.

```

TIME (EDT)	11 AM	1 PM	3 PM	5 PM	7 PM
SKY (%)	36	64	75	81	80
WEATHER COV					
WEATHER TYPE	NONE	NONE	NONE	NONE	NONE
TEMP	53	56	57	56	53
RH	42	38	37	37	40
GENERAL WIND	NW 11	NW 11	NW 12	NW 12	NW 11
GENERAL WIND GUST	20	20	25	25	20
HAINES INDEX	4	4	4	4	4

#### c) Procedures

The preferred method for requesting and issuing a spot forecast is from our website:

<https://www.weather.gov/spot/request/>

If necessary, you may fax a Spot Request Form D-1 to our office or phone in the specific request. If you use this method, a call would be greatly appreciated to alert us of the arriving fax. This will expedite the process. Copies of the Spot Request Form D-1 can be downloaded from the following site, or made available upon request:

[https://www.nws.noaa.gov/directives/010/401j/WS\\_FORM\\_D\\_SPOT.pdf](https://www.nws.noaa.gov/directives/010/401j/WS_FORM_D_SPOT.pdf)

Once sent, the forecasters will be alerted, as the product ARBSTQMKT alarms at the weather service office. A phone call to the forecast office is usually not needed, but may help clear up questions the forecasters may have about the request.

Once the forecast has been issued, the Spot website will auto-update/refresh. At the forecast office, the final forecast will also alert on the workstations, as the product ARBFWSMQT.

Feel free to test out our online request page. If you do send in a test request, please contact our office to tell one of the forecasters that you are doing so. If you have any questions about Spot requests feel free to give us a call. Feedback is greatly appreciated via the NWS Spot interface.

## 5. Hot Spot Notifications

The addition of the Hot Spot Notification Tool allows the NWS Forecasters to potentially provide advance notice of potential hot spots, especially in rural areas where reporting

may be limited. With this tool, NWS Forecasters now have the ability to combine advanced satellite technology and a notification system to enhance the level of services provided directly to fire weather partners across the Upper Peninsula.

*a) Criteria*

When a possible hot spot is detected via satellite and/or radar, forecasters are required to issue a notification to the specific fire agencies impacted. On elevated and/or critical fire weather days, where an SPS or RFW is in effect, the forecaster will also initiate a spot forecast for the agencies responsible for the jurisdictions impacted. The forecaster will use the lat/lons as noted on the Hot Spot Detection tool and a minimum of 15 acres as a first-guess of fire size. This will save the responding agency valuable time and allow them to focus on combating the fire.

*b) Potential Limitations of the Notifications*

Even through advanced satellite technology has improved our ability to detect hot spots, there are limitations that may at times hinder our ability to do so. In order to detect these hot spots at the surface the satellite must be able to see sample the surface. Therefore, if cloud cover, especially thick cloud cover, is overhead the hot spot will likely not be visible depending on the magnitude of the fire. Another caveat that may hinder the ability for the satellite to detect a hot spot is a smoldering fire under a thick canopy. One last issue that may limit our ability to detect the hot spot is the spatial coverage of the hot spot. The sensitivity of current satellite technology requires the hot spot to be around 15 acres large, with ideally limited canopy coverage and no clouds to optimal detection.

**6. Special Weather Statement (ARBSPSMQT)**

*a) Criteria*

A Special Weather Statement (ARBSPSMQT) can be used as an outlook for potential critical fire weather conditions beyond when a Fire Weather Watch is traditionally issued. It is also used for those times when conditions do not quite meet specific Fire Weather Watch or Red Flag Warning criteria, but elevated fire danger is expected due to forecast or ongoing weather conditions. The main concern is in the summer when we can have large wildfires in some of our more volatile fuels. In some cases we can have crown fires with significant fire spread in some of the Jack Pine forests when Relative Humidity values are closer to 35% (well above the 25% Red Flag Warning criteria value). This typically occurs when Temperatures are above normal and Winds are gusting over 25 mph.

The product briefly describes the fire danger, the weather conditions behind it, how long the conditions will last, and concludes with a brief call to action. A Special Weather Statement (SPS) may also be utilized for other larger events, as it will automatically highlight on our website, and may be a higher alert product for local and national media sources. However, it is of note that the SPS will likely be overwritten when we have other near-critical weather conditions expected. A couple of examples include near-severe thunderstorms and patchy dense fog.

Typical criteria for this product and evaluated wildfire conditions are generally a combination of 2 out of the 3 Red Flag Warning Criteria, but especially:

- Wind Gusts around or greater than 20 mph
- While Wind Gusts are the most critical parameter to key off of this product, we should otherwise be near Red Flag Warning criteria in regards to temperatures and relative humidity's. Temperatures should generally be running above normal, with Relative Humidity values less than 40%.

**b) Content**

**Forecaster Note:**

The SPS is created in GFE, under "SPS - Fire." Select the zones you want, with separate segments if appropriate. *Unless instructed to do otherwise by fire officials, avoid trying to describe the level of fire danger. Instead, use terms like elevated fire weather conditions.*

## **7. Fire Weather Watch, Red Flag Warning Program (ARBRFWMQT)**

The Fire Weather Watches and Red Flag Warnings are issued to alert of combination of dry fuel and weather conditions that could result in extensive wildfire occurrence or extreme fire behavior. These conditions alert our land management agencies to the potential for widespread new ignitions or control problems with existing fires, both of which could pose a threat to life and property.

A **Fire Weather Watch** is issued 12 to 96 hours in advance of the onset of possible warning conditions.

A **Red Flag Warning** is issued within 24 hours of the event (or onset of warning conditions).

**a) Criteria**

The parameters used to define a watch or warning includes relative humidity, wind speed, and temperature, and fuel moisture (defined as a period of dry weather). Specific fuel moisture must be coordinated with our users.

- A dry spell for over a week (shorter before spring green-up or after fall color)
- Sustained Wind Speed  $\geq 20$  mph (10 m ASOS-Airport winds)  
or  $\geq 15$  mph (20 ft RAWS winds)
- Relative Humidity 25% or less
- Temperature 70 F or greater

**Forecaster Note:** *The temperature and RH criteria are soft. Red Flag Warnings can be used for temperatures less than 70 degrees depending on other factors.*

Initial watch/warning coordination may be accomplished during the semi-routine weekly MIWFPA conference call. If a Fire Weather Watch is already in effect and expected weather conditions still meet Red Flag Warning criteria, no ok is needed from MIWFPA to issue the Red Flag Warning. Once a Red Flag Warning is issued the different agencies of MIWFPA should be notified as soon as possible. If no Fire Weather Watch is in effect, then contact must be made with MIWFPA before a Red Flag Warning is issued.

Contacts for MIWFPA coordination are listed below...

- Michigan DNR – Duty Officer
- Hiawatha NF and Pictured Rocks NL – Hiawatha Fire Management Officer (UPCC)
- Seney NWR – Josh Haen
- Ottawa NF – Duty Officer
- US BIA – Will Wiggins

Once a decision is made to issue a Fire Weather Watch or Red Flag Warning, the Fire Weather Forecast should be updated accordingly. You must also notify the EACC Floor Coordinator. They will likely ask you to provide what zones are in the watch or warning.

*b) Content*

The following is an example of a Red Flag Warning; a fire weather watch would look very similar. The header will state whether it is a Fire Weather Watch or Red Flag Warning. This narrative product will be comprised of a headline followed by a brief statement with more detail as to where, when, and why the product has been issued.

```
RED FLAG WARNING
NATIONAL WEATHER SERVICE MARQUETTE MI
601 AM EDT WED SEP 22 2010

...RED FLAG WARNING IN EFFECT FROM 2 PM EDT /1 PM CDT/ THIS
AFTERNOON TO 9 PM EDT /8 PM CDT/ THIS EVENING FOR NORTHWEST UPPER
MICHIGAN...

.HIGH PRESSURE WILL REMAIN ACROSS THE AREA TODAY. EXPECT AFTERNOON RELATIVE
HUMIDITY TO BOTTOM OUT AS LOW AS 20 PERCENT AWAY FROM THE MODERATING
INFLUENCE OF THE LAKE SUPERIOR AS HIGH TEMPERATURES REACH 65 TO 70.
NORTHWEST UPPER MICHIGAN MISSED OUT ON WIDESPREAD RAIN THAT FELL ON SUNDAY.
SUSTAINED WEST WINDS WILL BE 10 TO 15 MPH THIS AFTERNOON AS WELL.

ALTHOUGH THE WINDS ARE NOT LIKELY TO BE AS STRONG ON THURSDAY AFTERNOON AND
THE RELATIVE HUMIDITY WILL BE A BIT HIGHER...DAYTIME HIGH TEMPERATURES ARE
FORECAST TO PEAK FROM 70 TO 75 AWAY FROM THE GREAT LAKES. SO THE ELEVATED
FIRE RISK WILL PERSIST THROUGH THURSDAY BEFORE A CHANCE OF SHOWERS RETURNS
LATE THURSDAY NIGHT AND FRIDAY.

MIZ001>004-009-084-290100-
/O.NEW.KMQT.FW.W.0001.080528T1800Z-080529T0100Z/
KEWEENAW-ONTONAGON-NORTHERN HOUGHTON-BARAGA-GOGEbic-
SOUTHERN HOUGHTON-
601 AM EDT WED SEP 22 2010 /501 AM CDT WED SEP 22 2010/

...RED FLAG WARNING IN EFFECT FROM 2 PM EDT /1 PM CDT/ THIS AFTERNOON TO 9
PM EDT /8 PM CDT/ THIS EVENING...

THE NATIONAL WEATHER SERVICE IN MARQUETTE HAS ISSUED A RED FLAG
WARNING...WHICH IS IN EFFECT FROM 2 PM EDT /1 PM CDT/ THIS AFTERNOON TO 9 PM
EDT /8 PM CDT/ THIS EVENING.
```

HIGH TEMPERATURES WILL WARM TO 65 TO 70 DEGREES TODAY AWAY FROM LAKE SUPERIOR WITH RELATIVE HUMIDITY VALUES DROPPING TO AS LOW AS 17 TO 24 PERCENT THIS AFTERNOON INTO THIS EVENING AWAY FROM LAKE SUPERIOR. WEST WINDS WILL BE 10 TO 15 MPH THIS AFTERNOON AND EARLY EVENING WITH CRITICAL FIRE WEATHER CONDITIONS EXPECTED FROM 2 PM EDT TO 9 PM EDT TODAY. CONDITIONS WILL IMPROVE AFTER SUNSET WITH TEMPERATURES FALLING...RELATIVE HUMIDITIES RISING AND WINDS DYING DOWN.

A RED FLAG WARNING MEANS THAT CRITICAL FIRE WEATHER CONDITIONS ARE EITHER OCCURRING NOW...OR WILL SHORTLY. A COMBINATION OF STRONG WINDS...LOW RELATIVE HUMIDITY...AND WARM TEMPERATURES WILL CREATE EXPLOSIVE FIRE GROWTH POTENTIAL.

\$\$

## 8. Specific Online Products

There are many fire specific data and forecasts offered through our local and national NWS fire pages:

<http://weather.gov/mgt/fire>

<http://weather.gov/fire>

The following are just a few of the more useful products available.

### a) *Daily Fire Weather Briefing*

<http://www.weather.gov/media/mgt/FireWX.pdf> Graphical briefing generated daily before 7 am ET featuring temperature trends compared to normal for next 3 days (image below) in addition to forecasts of maximum temperature, highest wind gusts and lowest minimum humidity for today, tomorrow and the following day. Expected precipitation amounts for today and tomorrow and for the entire week are included in addition to general overview for the following week (days 8 to 14) in terms of temperature and precipitation departures. Surface weather maps for today and tomorrow are within the briefing as are various observations of precipitation over the previous two weeks (image below) and current drought indices (image below).

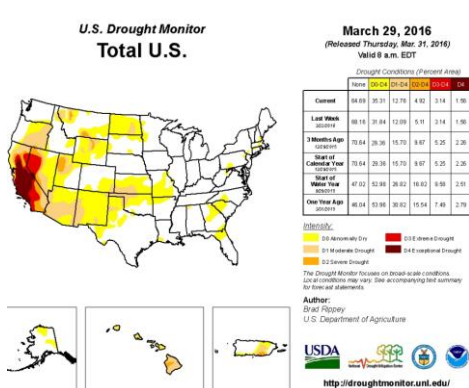
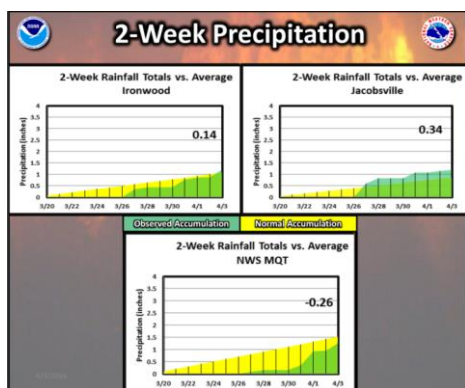
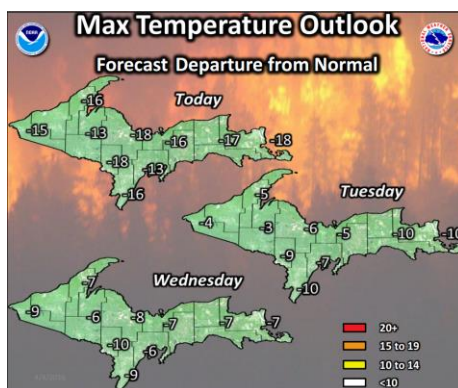
# U.P. Fire Weather Briefing

4/4/2016

This presentation is automatically updated each day by 7 a.m. Eastern

Always check the [latest forecast](#) and contact your local NWS office for further details

National Weather Service – Marquette, Michigan Issued: 4/4/2016 6:18 AM  
[www.weather.gov/mqt](http://www.weather.gov/mqt) [f](#) [t](#) [p](#)



## b) Fire Weather Graphics

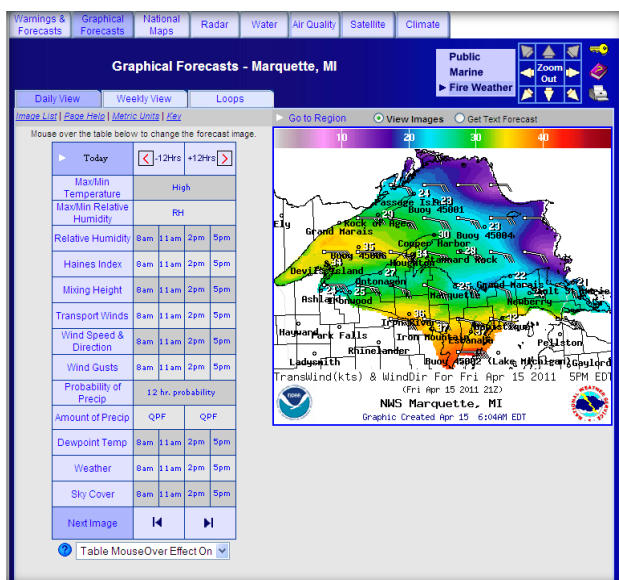
<http://www.weather.gov/forecasts/wfo/sectors/mqtFireDay.php#tabs>

(image below) Weather elements displayed in a map form in 3, 6, or 12 hour increments depending on the parameter. Data is available out through 6-7 days, with most Fire Weather elements going through the next 2 days. This product is updated several times a day, with the Fire Weather elements updated at least 2 times a day during the fire season (around 6 am and 5 pm).

A new zoomable higher quality interface is available at

<http://preview.weather.gov/graphical>

While this way of viewing our Graphical Forecasts will give you a cleaner looking image, there are only a select number of Fire specific graphics available.



### c) *Hourly Weather Graph*

<http://www.weather.gov/mqt>

Point-based hourly weather output for most parameters through the next 6-7 days, with most Fire Weather elements going through the next 2 days. This product is updated several times a day, with the Fire Weather elements updated at least 2 times a day during the fire season (around 6 am and 5 pm).

- On the map, click on your desired location
- If needed, edit location via the map in middle of page
- Scroll down to the bottom-right side of the page
- Select **Hourly Weather Graph**
- Select your desired Weather/Fire Weather Elements, adjust the time period "48-Hour Period Starting", and hit **Submit**



#### d) Weather Activity Planner

<http://forecast.weather.gov/wxplanner.php?site=mg>

To assist in prescribed burn planning, the Weather Activity Planner will allow you to easily find windows where the prescription conditions will be available. **Caution: several fire specific parameters will only be available for the first 2 days (example...Mixing Height, Transport Wind, Haines Index, Lightning Activity Level, Vent Rate).**



National Weather Service Forecast Office

Marquette, MI

Home

News

Organization

Search for:

WWS

AR NOAA

GO

Weather Activity Planner

Welcome to the Weather Activity Planner. Please enter the range of weather parameters required for your activity. Then, either click the approximate location on the map below, or enter the specific latitude and longitude and hit submit. This will query the forecast grids to find when your weather requirements will be met at the nearest grid point over the next 7 days. Public comments and suggestions are encouraged.

This application generates products from a digital forecast data base. It is intended to allow a user to define and produce a forecast for general planning purposes only. As any weather or hydrologic event evolves, updated forecasts and warnings are issued by the NWS. Customers are urged to obtain the latest official forecast information prior to engaging in any weather sensitive activity, and to monitor forecasts for updates during such activities.

The Weather Activity Planner is NOT meant to replace a spot forecast request. Weather Activity Planner surface winds are a gridded representation of projected, local surface winds at a 5km or 2.5km resolution. The surface winds returned do NOT account for fuel type, sheltering or slope aspect. Users can select either surface wind speeds or 20 foot winds (if the 20 foot wind grid is available). If precise wind forecasts are needed, please submit a spot forecast request to your servicing Weather Forecast Office.

[\(English Units - Click to Change\)](#)

Element

Temperature (°F)

Relative Humidity

Surface Wind Speed (mph)

Min

to

Max

Element

Surface Wind Direction

Sky Cover

Precipitation Potential

Min

to

Max

Base matches warnings & advisories

Gale Warning

Winter Weather Advisory

Small Craft Advisory

Wind Advisory

Gale Watch

Special Weather Statement

Hazardous Weather Outlook

Hydrologic Outlook

Short Term Forecast

Zoom Out

Latitude/Longitude Entry

decimal degrees (i.e. 42.134) or deg min sec (i.e. 42 23 34)

Latitude:

Longitude:

Use '-' (negative sign) in longitude for locations in Western Hemisphere

Submit

Weather Activity Planner for 45.19°N 87.52°W

Interactive

Point Forecast: 6 Miles N Northland MI

Weather Activity Planner

This interactive forecast display is intended for general planning purposes. Data entered may have been changed for accuracy. Please verify the below data is appropriate. All wind direction information should be entered in a clockwise direction (using compass directions i.e. E, ESE, SE, etc). Public comments and suggestions are encouraged.

This application generates products from a digital forecast data base. It is intended to allow a user to define and produce a forecast for general planning purposes only. As any weather or hydrologic event evolves, updated forecasts and warnings are issued by the NWS. Customers are urged to obtain the latest official forecast information prior to engaging in any weather sensitive activity, and to monitor forecasts for updates during such activities.

The Weather Activity Planner is NOT meant to replace a spot forecast request. Weather Activity Planner surface winds are a gridded representation of projected, local surface winds at a 5km or 2.5km resolution. The surface winds returned do NOT account for fuel type, sheltering or slope aspect. Users can select either surface wind speeds or 20 foot winds (if the 20 foot wind grid is available). If precise wind forecasts are needed, please submit a spot forecast request to your servicing Weather Forecast Office.

Temp (°F)

Relative Humidity

Surface Wind Speed (mph)

Mixing Height (ft)

Lightning Activity Level

Precipitation Potential

Sat, Apr 10

Sun, Apr 11

Mon, Apr 12

Tue, Apr 13

Wed, Apr 14

Thu, Apr 15

Fri, Apr 16

48-hr Element Meteorogram

Friday, April 22 at 11am

Temperature: N/A Surface Wind: N/A

Relative Humidity: N/A Precipitation Potential: N/A

Mixing Height: N/A Lightning Activity Level: N/A

Hazardous weather condition(s):

Winter Weather Advisory

Hazardous Weather Outlook

Element

Temperature (°F)

Relative Humidity

Surface Wind Speed (mph)

Min

20

to

40

Max

Element

Mixing Height (ft)

Lightning Activity Level

Precipitation Potential

Min

4000

to

222222

Max

NWS MQT Fire Weather Annual Operating Plan 2022

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## B. Special services, procedures for obtaining and billing

Special services could include teaching weather related courses or an on-site Incident Meteorologist (IMET).

When land management agencies wish for a fire weather forecaster to teach a course, the request should be made at least 3 weeks ahead of time. This can be done by calling or emailing the Fire Weather Program Manager(s). A one-day trip will not incur any costs to the requesting agency. However, with an overnight stay, travel expenses should be paid for by the requesting agency. In most cases reimbursement agreements are in place.

Please reference the Geographical Area Mobilization Guide and/or the National Mobilization Guide for details about IMET dispatches for wildland fire suppression operations.

**Michigan Interagency Wildland Fire Protection Association.** National Weather Service Fire Weather Program Manager(s) are members of this group, whose goal is to share information regarding wildland fire protection and prevention across the state of Michigan. The Michigan Interagency Wildland Fire Protection Association consists of representatives from the Michigan Department of Natural Resources, State Fire Marshal, Huron-Manistee, Hiawatha, and Ottawa National Forests, Seney National Wildlife Refuge, Pictured Rocks and Sleeping Bear Dunes National Lakeshore, U.S. Bureau of Indian Affairs, Michigan State Fire Chiefs Association, Michigan State Firemen's Association, U.P. Chiefs Association, and Michigan National Weather Service offices. Meetings are typically held in the fall and in the spring.

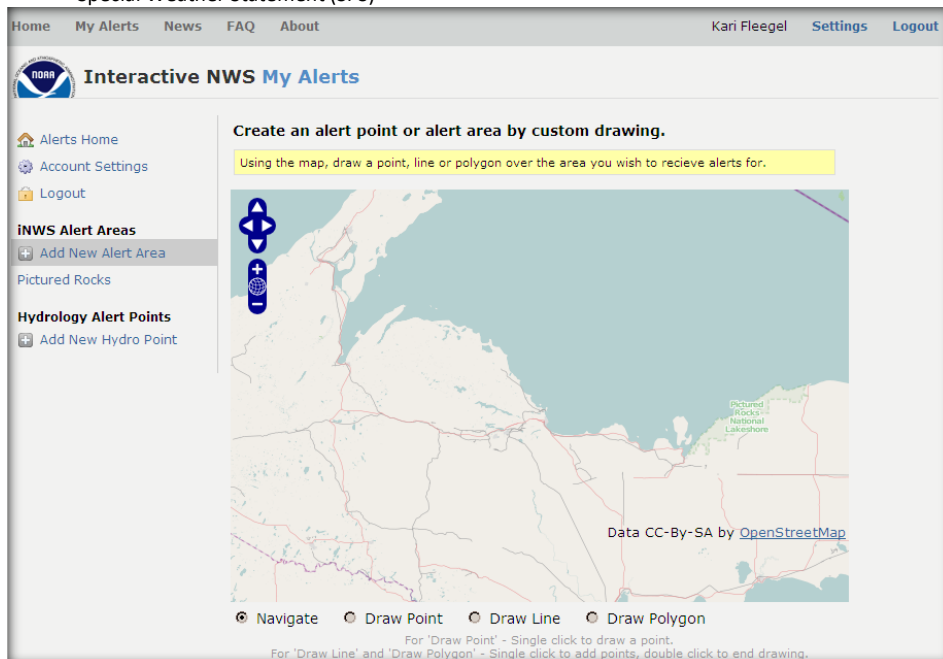
## C. Alert Communications

### 1. iNWS (Watch/Warning/Advisory Alerts)

<http://inws.ncep.noaa.gov>

The iNWS network is available for emergency personnel, which includes wildland firefighters and emergency planners. You are able to sign up for a location specific account that will provide you with email and/or text messages for selected Watch, Warning, and Advisory products issued by the National Weather Service. While many alerted products are available including Severe Thunderstorm and Tornado Warnings, the following products are for fire weather purposes...

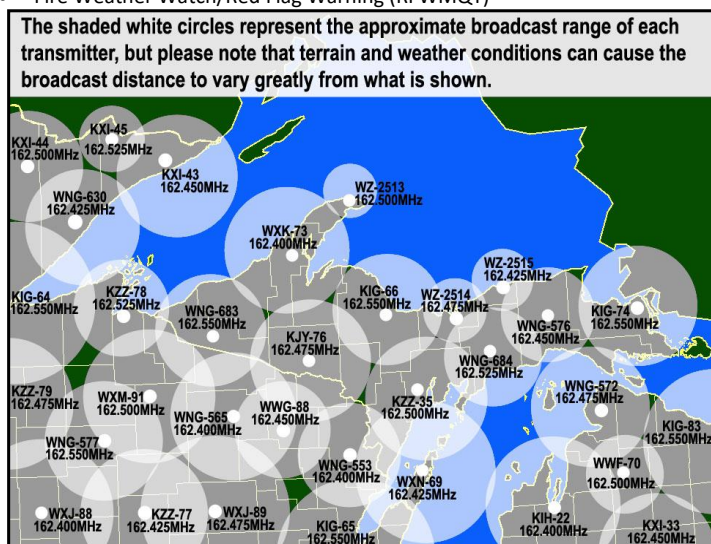
- Red Flag Warnings/ Fire Weather Watches (RFW)
- Special Weather Statement (SPS)



## 2. NOAA Weather Radio All Hazards

The products listed below will play on NOAA Weather Radio All Hazards at various intervals from every broadcast cycle, every 10 minutes, or more infrequent as needed. The periodicity of each product will vary depending on the severity of the fire situation and the presence of additional weather hazards (example- severe thunderstorms, flooding, etc.). However, they are typically broadcast every 10 minutes. Please contact the Fire Weather Focal Point(s) with any periodicity change requests.

- Special Weather Statement (SPS)
- Fire Weather Watch/Red Flag Warning (RFBW)



Call Sign	Site Name	Site Location (County)	Frequency	Power
KZZZ78	Ashland	Ashland (Ashland)	162.525	1000
WZ2513	Copper Harbor	Copper Harbor (Keweenaw)	162.500	300
KJY76	Crystal Falls	Crystal Falls (Iron)	162.475	1000
KZZ35	Escanaba	Escanaba (Delta)	162.500	1000
WNG572	Emmet County	Emmet County (Cheboygan)	162.475	300
WZ2515	Grand Marais	Grand Marais (Alger)	162.425	100
WXK73	Houghton	Painesdale (Houghton)	162.400	1000
WNG84	Manistique	Steuben (Schoolcraft)	162.525	300
WNG683	Marinesco	Marinesco (Gogebic)	162.550	300
KIG66	Marquette	Negaunee (Marquette)	162.550	300
WZ2514	Munising	Munising (Alger)	162.475	100
WNG576	Newberry	Newberry (Luce)	162.450	300
KIG74	Sault St. Marie	Daftner (Chippewa)	162.550	1000
WXN69	Sister Bay	Sister Bay (Door)	162.425	1000
WNG553	Wausaukee	Wausaukee (Marinette)	162.400	1000

## IV. JOINT RESPONSIBILITIES

Service boundaries and fire weather forecast zones, and text product specifics may be negotiated to meet customer and forecaster need.

## V. BACKUP PROCEDURES

### A. Backing up the Marquette forecast office (for APX and GRB staff)

We exchange primary backup responsibility with WFO Gaylord and secondary responsibility with WFO Green Bay. Please see the Service Area and Organizational Directory for phone numbers.

#### Forecaster Note:

Please view our Fire Weather Tabs on our Google Site,

<https://sites.google.com/a/noaa.gov/nws-cr-mqt/>

For additional information, please contact MQT Fire Weather Focal Point(s).

#### Backup Quick Reference

- Grids created through GFE, Procedures, Create Fire Wx Grids
  - Created 2x a day during, with the morning and afternoon forecast packages
  - Updated as needed
- Products issued through the GFE Formatter Launcher
  - FWF ...issued by 6 am EST daily (traditionally from April 15<sup>th</sup> – November 1<sup>st</sup>)
  - FWM...will automatically pull in all of our NFDRS sites
  - Spot (FWS)...set up ARBSTQMOT to alarm
  - SPS...Elevated Fire Weather Conditions
  - RFW (Hazard\_RFW)...coordinate with MIWFPA users first (plays on NWR every ~10 min.)
    - Michigan DNR – Duty Officer
    - Hiawatha NF, Pictured Rocks NL – UPCC Fire Management Officer /Matt Davis
    - Seney NWR – Josh Haen
    - Ottawa NF – Duty Officer
    - BIA – Will Wiggins

#### Criteria:

- A dry spell for over a week (shorter before spring green-up or after fall color)
- Sustained Wind Speed > = 20 mph (10 m ASOS-Airport winds)  
or >= 15 mph (20 ft RAWs winds)
- Relative Humidity 25% or less
- Temperature 70 F or greater  
*Note: The temperature criterion is soft. Red Flag Warnings can be used for temperatures less than 70 degrees depending on other factors.*
- Impact-Based Decision Support Services
  - Weekly MIWFPA Webinars...spring and late summer only, as needed
    - Ask NWS MQT additional information
    - Weather for the week, potential for RFWs, and current fuel conditions are discussed
  - Hot spot Notifications
    - Spot Forecast Issuances on critical fire weather days when a hot spot is detected

## **B. Backing up surrounding offices (for MQT staff)**

### **Forecaster Note:**

See the attached reference material from both APX and GRB (in the Fire Weather Binder and MQT Fire Weather Google Site Pages, as well as the “Service Backup” information.

Please remember to set up the appropriate workstation alarms for spot requests.

- Gaylord: ARBSTQAPX
- Green Bay: MKESTQGRB