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Operations and Services
Marine, Tropical, and Tsunami Services, NWSPD 10-3
GREAT LAKES MARINE SERVICES

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SUMMARY OF REVISIONS: This directive supersedes NWSI 10-312, *Great Lakes Marine Services*, dated May 17, 2020. This directive includes the following changes:

1. Section 4.3.5c. revised to include forecaster discretion.
2. Replaced outdated examples in Appendix B and added an example with "SMALL CRAFT SHOULD EXERCISE CAUTION" headline.
3. In Appendix B, deleted reference to the Great Lakes Weather Broadcast, which is not in the chapter or appendix.

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GREAT LAKES MARINE SERVICES

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1 Introduction

This procedural instruction provides product specifications for the main alphanumeric Great Lakes weather products issued by the National Weather Service (NWS) Weather Forecast Offices (WFOs).

2 Open Lake Forecast (product category GLF)

2.1 Mission Connection

The Open Lake Forecast (GLF) is a text product issued by five primary Great Lake WFOs to state expected weather conditions within their marine forecast area of responsibility through Day 5. The primary offices responsible for issuing the GLF are: WFOs Marquette, MI (MQT); Detroit, MI (DTX); Milwaukee/Sullivan, WI (MKX); Cleveland, OH (CLE); and Buffalo, NY (BUF). The GLF is used by a variety of marine users and partners, and is primarily used as a tool for planning purposes to support and promote safe transportation across the Great Lakes.

2.2 Issuance Guidelines

Forecasters should ensure the values included within the GLF are consistent with the values from the associated gridded forecast elements.

2.2.1 Creation Software

WFOs will produce the GLF using the Advanced Weather Interactive Processing System (AWIPS) software formatters. The Graphical Forecast Editor (GFE) and the Graphical Hazards Generation (GHG) application formatting tools should be used for generation of product content including headlines.

2.2.2 Issuance Criteria

The GLF will be issued four times a day with updates as necessary.

2.2.3 Issuance Time

The GLF is a routinely-scheduled product. Forecasters should make the GLF available to users no earlier than 1 hour before this scheduled issuance time. The issuance time is expressed in Coordinated Universal Time (UTC), while the mass media header is expressed in local time. WFOs should issue GLFs based on the following:

Time Period	**Scheduled Issuance Times (UTC)**			
Standard Time	0300	0900	1500	2100
Daylight Saving	0200	0800	1400	2000

In the GLF, include forecast periods as shown below. Forecast periods beyond the current day will be described by the day of the week. For example, a forecast issued Sunday evening will include: TONIGHT, MONDAY, MONDAY NIGHT, TUESDAY, TUESDAY NIGHT, WEDNESDAY, THURSDAY, and FRIDAY.

The 0900 / 0800 and 1500 / 1400 scheduled issuance times (UTC) will cover:

Today / This Afternoon (or equivalent)	(Issuance time to 6PM)	1st Period
Tonight	(6PM to 6AM)	2nd Period
(Next Day)	(6AM to 6PM)	3rd Period
(Next Day) Night	(6PM to 6AM)	4th Period
(Day 3)	(6AM to 6AM)	5th Period
(Day 3) Night (Optional)	(6PM to 6AM)	6th Period
(Day 4)	(6AM to 6AM)	Day 4
(Day 5)	(6AM to 6AM)	Day 5

The 2100 / 2000 and 0300 / 0200 scheduled issuance times (UTC) will cover:

Tonight / Rest of Tonight (or equivalent)	(Issuance time to 6AM)	1st Period
(Next Day)	(6AM to 6PM)	2nd Period
(Next Day) Night	(6PM to 6AM)	3rd Period
(Day 2)	(6AM to 6PM)	4th Period
(Day 2) Night	(6PM to 6AM)	5th Period
(Day 3)	(6AM to 6AM)	6th Period
(Day 3) Night (Optional)	(6PM to 6AM)	7th Period
(Day 4)	(6AM to 6AM)	Day 4
(Day 5)	(6AM to 6AM)	Day 5

2.2.4 Valid Time

The GLF product is valid from the time of issuance until the expiration time.

2.2.5 Product Expiration Time

The GLF product expiration time is not more than 8 hours from the initial issuance.

2.2.6 Universal Geographic Code (UGC)

The GLF product will contain marine-based zone UGC codes.

2.3 Technical Description

The GLF product will follow the format and content described in this section.

2.3.1 Mass News Disseminator (MND) Broadcast Line None.

2.3.2 MND Header

The GLF MND Header is: "OPEN LAKE FORECAST FOR [LAKE SUPERIOR, LAKE MICHIGAN, LAKE HURON, LAKE ERIE, or LAKE ONTARIO]."

2.3.3 Content

The GLF includes all required forecast parameters and forecast periods in each marine zone, and follows the format in section 2.4.

Forecasters should include applicable National Marine Sanctuaries, as noted in NWS Instruction (NWSI) 10-302, *Marine and Coastal Services Area of Responsibility*, in the appropriate GLF.

Forecasters may combine periods if, based on forecaster discretion, the weather elements in each are consistent. In addition, forecasters may subdivide the first period of any GLF to account for rapid weather changes.

WFO DTX forecasters will issue the Lake St. Clair Forecast following the format of the GLF. Exceptions: During the period when Nearshore Forecasts (NSH) are issued, these forecasts should also include sky conditions and Small Craft Advisories (SCA) in the Lake St. Clair Forecast.

2.3.4 Synopsis

Forecasters may add a synopsis to the GLF. The synopsis for the GLF should be a concise, understandable description of the significant surface weather features that may cause significant winds and waves over the forecast area during the forecast period. At a minimum, it should identify the strength, trend and movement of each major weather system affecting the area. References to high pressure and low pressure should include a central pressure measurement in

inches, to the nearest tenth. The synopsis is broadcast over the marine radio; therefore, it should contain complete and grammatically correct sentences. All synopses will be meteorologically consistent with other products issued by the WFO.

2.3.5 Headlines

Use headlines to describe hazard events likely to have a significant impact on mariners or marine operations. Marine warnings and advisories are only mandated in the first 12-hour forecast period. In most situations, to reduce multiple headlines, the forecaster can leave off the hazards after the upgrade and headline the most severe hazard only. However, forecasters should use multiple headlines for events at the same significance level but different discrete criteria (e.g., Gale Warning and Heavy Freezing Spray Warning).

Refer to NWSI 10-303, *Marine and Coastal Services Standards and Guidelines,* for definitions of Gale, Storm, Hurricane Force Wind, or Heavy Freezing Spray Warnings and Watches, and all advisories that may be included within the GLF.

a. Watch and Warning Headlines. In the GLF, the following headlines for watches and warnings will be included if appropriate criteria are occurring or forecast to occur:

Hurricane Force Wind Warning Storm
Warning
Gale Warning
Heavy Freezing Spray Warning
Tornado Watch
Severe Thunderstorm Watch
Gale Watch
Storm Watch
Hurricane Force Wind Watch
Heavy Freezing Spray Watch

Gale Warnings / Storm Warnings / Hurricane Force Wind Warnings / Heavy Freezing Spray Warnings. WFOs with marine responsibility for the Great Lakes will issue warnings when criteria are met for the first period, and may issue warnings for the second and/or third period when forecaster confidence is high. Warnings that begin in the first, second or third period may extend beyond the third period.

In situations where sustained winds are below advisory/warning thresholds but wind gusts above these thresholds, forecasters should use their own discretion in issuing advisories or warnings as appropriate. Winds will be considered gusty when gusts are regularly observed over a time period of more than two hours.

Gale Watches / Storm Watches / Hurricane Force Wind Watches / Heavy Freezing Spray Watches. WFOs should issue Watches for the second, third, or occasionally fourth periods, when there is a 50 percent or greater chance of a hazardous marine weather event meeting or exceeding warning criteria.

b. Advisory Headlines. Headlines for advisories within the GLF may be included when conditions over the Open Lakes are occurring or forecast where vessels will be impacted by ashfall or low water, or ***reduced visibilities of 1 nautical mile (nm) or less in dense fog and dense smoke***.

Great Lakes WFOs may issue advisories when criteria are met for the first period, and may issue advisories for the second period and third periods when forecaster confidence is high. Advisories beginning in the first, second, or third period may extend beyond the third period.

The following advisories may be issued within the GLF when sufficient observational data is available:

Dense Fog Advisory
Dense Smoke Advisory
Ashfall Advisory
Low Water Advisory

2.3.6 1-3 Day Forecast Periods

Except as noted below, include forecasts of wind and waves in each discrete forecast period in the GLF. Forecasters should also include forecasts of other weather significantly impacting the marine zone(s) (e.g., ice accretion, precipitation, low visibility, etc.). Emphasize the most critical conditions.

2.3.7 4-5 Day Forecast Periods

Include wind and wave conditions in each 24-hour period. Forecasters should also include forecasts of other weather significantly impacting the marine zone(s) (e.g., ice accretion, precipitation, low visibility, etc.). Emphasize the most critical conditions.

2.3.8 GLF - Forecast Parameters

a. Winds. Winds represent predominant conditions 10 meters above mean lake level. Give wind direction to eight points of the compass. Avoid such phrases as “N TO NE WINDS”. Forecasters may indicate changes with terms such as “BECOMING”, or by dividing the forecast area into segments. Forecasters should round speeds to the nearest 5 knots (KT) in forecasting wind speeds and ranges in wind speeds. The terms “BECOMING”, “INCREASING”, AND “DIMINISHING” may be used when appropriate, but not “DECREASING.”

b. Waves. The forecast wave heights should represent the significant wave height in the forecast area. Forecasters may either use one value or a small range in values.

Do not use terms such as “rough” and “moderate”, or open-ended terms such as “waves greater than 5 feet.”

Do not forecast waves when ice covers a major part (approximately 80 percent) of the marine zone. When this occurs, add the phrase “waves omitted for mostly ice-covered areas” directly

following the final forecast period. Similarly, append "wave heights are for ice free areas" when forecasting wave heights across marine zones with less ice coverage.

c. Significant Weather / Visibility. Forecasters should include significant weather posing a hazard to navigation when expected (e.g., fog or heavy precipitation lowering visibility to 1 nm or less, or thunderstorms). Forecasters may use precipitation probability terms "CHANCE", "OCCASIONAL", etc., as applied in NWSI 10-204, *Derived Forecast Text Products Specifications*. Forecasters may include obstructions to visibility ranging between 1 nm to 5 nm. However, forecasters should not include sky cover.

Forecasters may include specific visibility distances based on local or regional guidelines.

Forecasters should emphasize thunderstorms in the GLF product. They may include the phrase "winds and waves higher near thunderstorms" but only with respect to the most significant thunderstorms. If a moderate or high risk of severe weather is indicated for a marine zone, forecasters should use phrases such as "strong thunderstorms are possible" or "thunderstorms some possibly severe."

d. Icing. Forecasters should include a headline whenever ice accretion on exposed surfaces is likely. Because ice accumulation rates are ultimately dependent on individual ship characteristics and operating conditions, use only the following headlines:

Heavy Freezing Spray Warning
Heavy Freezing Spray Watch

e. Air Temperatures. Air temperatures are optional, and should only be included if they are forecast to be at or below freezing, and the forecaster considers this information to be significant.

2.3.9 Coordination and Collaboration

Field offices with adjoining or overlapping areas of responsibility should coordinate and collaborate to ensure products are consistent and compatible. This effort includes communication with appropriate governmental forecast agencies outside the United States.

Forecasters should reference Section 5, Forecasters should refer to Section 5, Digital Forecast Collaboration, of NWSI 10-201, *National Digital Forecast Database and Local Database Description and Specifications*, for detailed information on the coordination and collaboration processes for gridded forecasts and analyses, available at:
https://www.weather.gov/media/directives/010_pdfs/pd01002001curr.pdf

2.4 Format

This product is available in industry standard encoding and languages, and may include, but not limited to, American Standard Code for Information Exchange (ASCII), Extensible Markup Language (XML), Wireless Markup Language (WML), File Transfer Protocol (FTP), and HyperText Markup Language (HTML).

(WMO ID)(UTC ISSUANCE DATE TIME)
(AWIPS ID)

Open Lake forecast for (name of Great Lake)
National Weather Service (city)(state)
(issuance time) AM/PM (local time zone)(day)(date)

(Refer to section 2.4.a, Areal Descriptor, for inclusion of next line.)
Lake (name) forecast beyond five nautical miles from shore

.Synopsis...text.

(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(FORECAST AREA DESCRIPTOR[S])
(ISSUANCE TIME) AM/PM (LOCAL TIME ZONE) (DAY)
(DATE)

...HEADLINE(S) (If needed)...

PERIOD 1...
PERIOD 2...
PERIOD 3...
PERIOD 4...
PERIOD 5...
PERIOD 6 (Optional period for the morning issuance)...
PERIOD 7 (Optional period for the afternoon/evening
issuance)... (Day 4)... (Day 5)...
(waves omitted for mostly ice covered areas-included in season)
(wave heights are for ice free areas-included in season)

$$
Forecaster Name (optional)

Figure 1. Open Lake Forecast (GLF) Format

a. Areal Descriptor. To highlight the demarcation between the NSH and GLF, append the phrase "Lake (name) forecast beyond five nautical miles from shore", as noted in Figure 1. Omit this phrase when the NSH is not issued.

2.4.1 GLF - Unscheduled Forecasts

As needed, append either "...Updated" or "...Corrected" to the product header whenever, respectively, an unscheduled GLF is issued or when an error in the GLF is corrected. Add a short description of the updated or corrected items just below the areal header to highlight the change.

Open Lake Forecast for (name of Great Lake)...Updated
National Weather Service (city)(state)
(issuance time) AM/PM (local time zone)(day)(date)

.synopsis..text.

(areal ugc code[s])-(expiration time)-
(forecast area descriptor[s])
(issuance time) AM/PM (local time zone) (day) (date)

Reason for update.

...headline(s) (If needed)...

PERIOD
1... etc.

Figure 2. Unscheduled Open Lake Forecast (GLF) Format

2.5 Updates, Amendments, and Corrections

GLFs will be updated when the on-duty forecast team believes the current forecast is not representative. WFOs will correct GLFs for format and grammatical errors. Forecasters will update the GLF when a Tornado Watch or Severe Thunderstorm Watch has been issued.

3 Coded Marine Forecast (MAFOR; appended to product category GLF)

3.1 Mission Connection

The Coded Marine Forecast (MAFOR) is a text forecast appended to the GLF. The MAFOR, adapted from World Meteorological Organization (WMO) code FM-61-IV, is a coded version of the first 24 hours of the GLF. No MAFOR is done for Lake St. Clair.

3.2 Issuance Guidelines

Forecasters should ensure the values included within the MAFOR are consistent with the values from the associated gridded forecast elements.

3.2.1 Creation Software

WFOs produce the MAFOR and append it to the GLF using AWIPS software formatters.

3.2.2 Issuance Criteria

The MAFOR will be appended to every GLF issued four times a day with updates as necessary. Forecasters should make these forecasts available to users by the scheduled issuance time, but no earlier than 1 hour before this issuance time.

3.2.3 Issuance Time

MAFORs are routinely scheduled.

3.2.4 Valid Time

MAFORs are valid 1 hour after the issuance of the GLF.

3.2.5 Product Expiration Time

The MAFORs expiration time is the same as the GLF.

3.3 Technical Description

MAFORs will follow the format and content described in this section.

3.3.1 MND Broadcast Line None.

3.3.2 MND Header

The MAFOR will be appended to the GLF, MND Header "Open Lake Forecast for [Lake Superior, Lake Michigan, Lake Huron, Lake Erie, or Lake Ontario]".

3.3.3 Content

Forecasters may issue the MAFOR either for an entire Lake or for a Lake segment. It will reflect the predominant conditions over that area for the 24-hour period. Usually only one headline is allowed in the MAFOR. See Appendix A, footnote b, for more information and exception.

3.3.4 GLF MAFOR - Forecast Parameters

a. Wind (sustained). Use the following for conversion from plain language to the MAFOR code:

Wind Direction: Forecasters should use a single wind direction as given in the plain language forecast. Periodically, since the minimum time period in the MAFOR code is 3 hours, the forecaster may have to show wind shifts with frontal passages using an additional group "9".

Wind Speed: Use the following to convert wind speed, in knots, from the narrative forecast to the MAFOR code:

Narrative Forecast Value	MAFOR Code
Light, less than 10, or 5-10 knots	0
5-15, 10-15 knots	1
10-20, 15-20 knots	2
15-25, 20-25 knots	3

30 knots	4
35 knots	5 GW
45 knots	6 GW
50-55 knots	7 SW
60 knots	8 SW
over 60 knots	9 HFW

GW = Gale Warning
SW = Storm Warning
HFW = Hurricane Force Wind Warning

b. Forecast Weather. The MAFOR code will identify the most significant weather (based on Appendix A where the higher number is more significant). When precipitation is "categorical" or "likely", the forecaster should include it as the last digit of a main group. If other weather types are also forecast, they should be placed in the plain language section of the MAFOR or as a "9" (occasional) group of the MAFOR code. If a weather type is included in the coded portion of the MAFOR, it should not be included in the plain language section.

3.4 Format

Follow the NWS MAFOR Code for the Great Lakes shown in Appendix A. This product is available in industry standard encoding and languages, and may include, but not limited to, ASCII, XML, WML, FTP, and HTML.

3.4.1 MAFOR - Unscheduled Forecasts

Forecasters should update MAFORs when necessary to ensure consistency with the GLF. In such cases, since these products are subdivided into no less than 3-hour blocks, the MAFOR will be valid from the nearest 3 hour of the new issuance time to the ending valid time of the MAFOR being updated. For example, a MAFOR valid from 16 UTC to 16 UTC amended at or before 1729 UTC would still be valid from 16 UTC. However, this MAFOR amended at 1730 UTC to 2029 UTC would be valid at 19 UTC. In both cases, the MAFOR is valid until 16 UTC.

3.4.2 Updates, Amendments and Corrections

MAFOR forecasts will be updated when the forecaster decides the current forecast is no longer representative. WFOs will update MAFOR by adding the letters "AMD" following the effective starting time. WFOs will correct MAFOR for format and grammatical errors by adding the letters "COR" following the effective starting time.

4 Nearshore Marine Forecast (product category NSH)

4.1 Mission Connection

The Nearshore Marine Forecast (NSH) is a text product issued by Great Lakes WFOs to state expected weather conditions within their marine forecast area of responsibility through the fourth period (or through Day 5) (optional). The NSH is used by a variety of marine users and

partners, and is primarily used as a tool for planning purposes to support and promote safe transportation across the Great Lakes.

4.2 Issuance Guidelines

Forecasters should ensure the values included within the NSH are consistent with the values from the associated gridded forecast elements.

4.2.1 Creation Software

WFOs will produce the NSH using the AWIPS software formatters. The GFE application formatting tools will be used for generation of product content. All WFOs issuing the NSH will use the GHG application formatting tool to produce hazard headline.

4.2.2 Issuance Criteria

The NSH will be issued four times a day with updates as necessary.

The nearshore waters refer to the over water area extending to 5 nm perpendicular from the shore line. Larger bays are also included in the nearshore waters. Forecasters should ensure the NSH is consistent with their adjacent GLF.

NSHs may be issued year-round. At a minimum, the NSH will be issued throughout the boating season, dependent on ice conditions on the entrances to each individual Lake. Specific dates are determined by responsible Regions. WFOs may request to suspend forecasts when the nearshore zones are frozen to the point there is no ship/boat traffic.

If needed, or after receiving approval to suspend the NSH for frozen nearshore zones, forecasters may include, below period 4 (or below Day 5 if issued out through 5 days) of the last NSH product of the year, a statement such as: “This is the last (AWIPS id) issuance for (year). The (AWIPS ID) will again be issued around April 1 (year).”

4.2.3 Issuance Time

NSHs are routinely-scheduled products. The issuance time is expressed in UTC, while the mass media header is expressed in local time. The issuance time in the mass media header is the same time as the product was actually issued by the WFO. WFOs should issue NSHs based on the following schedule:

Time Period	**Scheduled Issuance Times (UTC)**			
Standard Time	0400	1000	1600	2200
Daylight Saving	0300	0900	1500	2100

In the NSH, include forecast periods as shown below. All forecast periods beyond the current day will be described by the day of the week. For example, a forecast issued Thursday morning will include: TODAY, TONIGHT, FRIDAY, FRIDAY NIGHT, SATURDAY (optional), SUNDAY (optional), MONDAY (optional).

The 1000 / 0900 and 1600 / 1500 scheduled issuance times (UTC) will cover:

Today / This Afternoon (or equivalent)	(Issuance time to 6PM)	1st Period
Tonight	(6PM to 6AM)	2nd Period
(Next Day)	(6AM to 6PM)	3rd Period
(Next Day) Night	(6PM to 6AM)	4th Period
(Day 3) (optional)	(6AM to 6AM)	Day 3
(Day 4) (optional)	(6AM to 6AM)	Day 4
(Day 5) (optional)	(6 AM to 6 AM)	Day 5

The 2200 / 2100 and 0400 / 0300 scheduled issuance times (UTC) will cover:

Tonight / Rest of Tonight (or equivalent)	(Issuance time to 6AM)	1st Period
(Next Day)	(6AM to 6PM)	2nd Period
(Next Day) Night	(6PM to 6AM)	3rd Period
(Day 2)	(6AM to 6PM)	4th Period
(Day 2) Night (optional)	(6 PM to 6 AM)	5th Period
(Day 3) (optional)	(6AM to 6AM)	Day 3
(Day 4) (optional)	(6AM to 6AM)	Day 4
(Day 5) (optional)	(6AM to 6AM)	Day 5

Great Lakes WFOs may issue the NSH out to five days, or direct to a 3-5 day forecast below period 4. See examples in Appendix B. Any Great Lakes WFO wanting to extend their NSH to five days should first coordinate with national and the appropriate regional headquarters.

4.2.4 Valid Time

NSHs are valid from the time of issuance until the expiration time.

4.2.5 Product Expiration Time

The NSH product expiration time is not more than 8 hours from the initial issuance.

4.2.6 UGC

The NSH will contain marine-based zone UGC codes.

4.3 Technical Description

NSHs will follow the format and content described in this section.

4.3.1 MND Broadcast Line None.

4.3.2 MND Header

The NSH MND Header is “NEARSHORE MARINE FORECAST”.

4.3.3 Content

The NSH includes all required forecast parameters and forecast periods in each marine zone, and follows the format in section 4.4.

Forecasters should include applicable National Marine Sanctuaries, as noted in NWSI 10-302, *Marine and Coastal Services Area of Responsibility*, in the specific zone(s) segment of the appropriate NSH.

Forecasters may combine periods if, based on forecaster discretion, the weather elements in each are consistent. In addition, forecasters may subdivide the first period of any NSH to account for rapid weather changes.

WFO Detroit-Pontiac (DTX) forecasters will issue the Lake St. Clair Forecast following the format of the GLF. Exception: WFO DTX forecasters should include sky conditions and SCAs in the Lake St. Clair Forecast.

4.3.4 Synopsis (optional)

Forecasters may add a synopsis to the NSH. The synopsis should be similar to the associated GLF synopsis for the forecast area. See section 2.3.4.

4.3.5 Headlines

Use headlines to emphasize weather events likely to have a significant impact on mariners or marine operations. The headlines generated by GHG software are sorted in chronological order by start time, then by action, by significance, and alphabetically by phenomena. These headlines should include the hazard, action, and timing phrases. Refer to NWSI 10-1701, *Text Product Formats and Codes*, for additional details.

Marine warnings and advisories are only mandated in the first 12-hour forecast period. In many situations (e.g., Gale Warning vs. SCA), to reduce multiple headlines, the forecaster can leave off the hazards after the upgrade and headline the most severe hazard only. However, forecasters should use multiple headlines for events at the same significance level but different discrete criteria (e.g., Gale Warning and Heavy Freezing Spray Warning). Refer to NWSI 10-303, *Marine and Coastal Services Standards and Guidelines*, for SCAs (all types) and regional definitions, all other advisories that may be included in the NSH, as well as definitions for Gale, Storm, Hurricane Force Wind, and Heavy Freezing Spray Warnings and Watches.

a. Warning Headlines. WFOs with marine responsibility for the Great Lakes will issue warnings when criteria are met for the first period, and may issue warnings for the second and third period when forecaster confidence is high. Warnings beginning in the first, second, or third period may extend as long as necessary.

Watch headlines. WFOs should issue watches for the second, third, or occasionally fourth periods, when there is a 50 percent or greater chance of a hazardous marine weather event meeting or exceeding warning criteria.

The following watch and warning headlines will be included in the NSH if appropriate criteria are occurring or forecast to occur:

Hurricane Force Wind Warning
Storm Warning
Gale Warning
Heavy Freezing Spray Warning
Tornado Watch
Severe Thunderstorm Watch
Gale Watch
Storm Watch
Hurricane Force Wind Watch
Heavy Freezing Spray Watch

b. Advisory Headlines. Based on event significance, forecasters will include headlines for advisory events in the NSH when conditions over marine zones are occurring or forecast where small craft will be impacted by winds and / or waves, low water, ashfall, or ***reduced visibilities to 1 nm or less in dense fog or dense smok***e.

Great Lakes WFOs will include advisory headlines when criteria are met for the first period, and may issue advisories for the second period and third periods when forecaster confidence is high. Advisories beginning in the first, second, or third period may extend as long as necessary.

Great Lakes WFOs will include a SCA in the NSH when criteria are met and where there is sufficient open water (ice-free lakes) to include wave forecasts.

Headlines for the following advisories should be issued when sufficient observational data is available.
Dense Fog Advisory
Dense Smoke Advisory
Ashfall Advisory
Low Water Advisory

c. Cautionary Statements. Based on local or regional policy, WFOs may manually include cautionary statements (e.g., Small Craft Should Exercise Caution) in situations below SCA criteria).

In situations where sustained winds are below advisory/warning thresholds but winds gust above these thresholds, forecasters should use their own discretion in issuing advisories, cautionary statements, or warnings as appropriate. Winds will be considered gusty when gusts are regularly observed over a time period of more than two hours.

4.3.6 Forecast Periods

Except as noted below, include forecasts of wind and waves in each discrete forecast period in the NSH. Forecasters should also include forecasts of other weather significantly impacting the

marine zone(s) (e.g., sky cover or significant weather, ice accretion, precipitation, low visibilities, etc.). Emphasize the most critical conditions.

For WFOs issuing the NSH to 5 days, include wind and wave conditions in each 24-hour period. Forecasters should also include forecasts of other weather significantly impacting the marine zone(s) (e.g., ice accretion, precipitation, low visibility, etc.). Emphasize the most critical conditions.

4.3.7 NSH - Forecast Parameters

Winds. Winds represent predominant conditions 10 meters above mean lake level. Give wind direction to eight points of the compass. Avoid such phrases as "N to NE winds". Forecasters may indicate changes with terms such as "becoming," or by dividing the forecast area into segments. Forecasters should round speeds to the nearest 5 KT in forecasting wind speeds and ranges in wind speeds. The terms "becoming", "increasing," and "diminishing" may be used when appropriate, but not "decreasing."

b. Waves. The forecast wave heights should represent the significant wave height in the forecast area. Forecasters may either use one value or a small range in values.

Do not use terms such as "rough" and "moderate", or open-ended terms such as "waves greater than 5 feet".

Do not forecast waves when ice covers a major part (approximately 80 percent) of the marine zone. When this occurs, add the phrase "waves omitted for mostly ice-covered areas" directly following the final forecast period. Similarly, append "wave heights are for ice free areas" when forecasting wave heights across marine zones with less ice coverage.

c. Significant Weather / Visibility. Forecasters should include significant weather posing a hazard to navigation when expected (i.e., fog or heavy precipitation lowering visibilities to 1 nm or less, or thunderstorms). Forecasters may use precipitation probability terms "chance", "occasional", etc., as defined in NWSI 10-503. Forecasters may include obstructions to visibility ranging between 1 nm and 5 nm. Forecasters should include sky cover if there is no significant weather forecast. Forecasters may include specific visibility distances based on local or regional guidelines.

Forecasters should emphasize thunderstorms in NSHs. They may include the phrase "winds and waves higher near thunderstorms" but only with respect to the most significant thunderstorms. If a moderate or high risk of severe weather is indicated for a Marine Zone, forecasters should use phrases such as "strong thunderstorms are possible" or "thunderstorms some possibly severe".

d. Icing. Forecasters should include a headline whenever ice accretion on exposed surfaces is likely. Because ice accumulation rates are ultimately dependent on individual ship characteristics and operating conditions, only use the following headlines:

Heavy Freezing Spray Warning

Heavy Freezing Spray Watch

e. Air Temperatures. Air temperatures are optional. However, they should only be included if they are forecast to be at or below freezing and if the forecaster considers this information to be significant.

f. Miscellaneous Information. Based on local requirements, forecasters may include other pertinent information (e.g., water temperatures or water levels) at the end of the forecast.

4.3.8 Coordination and Collaboration

Field offices with adjoining or overlapping areas of responsibility should coordinate and collaborate to ensure products are consistent and compatible. This effort includes communication with appropriate governmental forecast agencies outside the United States.

Forecasters should reference Section 4, Inter-site Coordination and Collaboration, of NWSI 10-201, *National Digital Forecast Database and Local Database Description and Specifications*, for detailed information on the coordination and collaboration processes for gridded forecasts and analyses, available at:
https://www.weather.gov/media/directives/010_pdfs/pd01002001curr.pdf

4.4 Format

The following format will be used for the NSH. This product is available in industry standard encoding and languages, and may include, but not limited to, ASCII, XML, WML, FTP, and HTML.

(WMO ID)(UTC ISSUANCE DATE TIME)
(AWIPS ID)

Nearshore Marine Forecast (+ optional descriptor)
National Weather Service (city)(state)
(Issuance time) AM/PM (Local time zone) (Day) (dd Month yyyy)

For waters within five nautical miles of shore on Lake (Name)

(Areal UGC code[s])-(Expiration time)-
(Forecast area descriptor[s])
(Issuance time) AM/PM (Local time zone)(Day)(dd Month yyyy)

...Headline(s)... (If needed)

PERIOD 1...
PERIOD 2...
PERIOD 3...
PERIOD 4...

(Waves omitted for mostly ice covered areas – included in season)
(Wave heights are for ice free areas – included in season)

(Last issuance statement) (If needed)
$$
Forecaster name (Optional)

Figure 3. Nearshore Marine Forecast (NSH) Format

4.4.1 NSH – Unscheduled Forecasts

As needed, append either "…UPDATED" or "…CORRECTED" to the product header whenever, respectively, an unscheduled NSH is issued or when an error in the NSH is corrected. Add a short description of the updated or corrected items just below the areal header to highlight the change.

(WMO ID)(UTC ISSUANCE DATE TIME)
(AWIPS ID)

Nearshore marine forecast (+ Optional descriptor) ...Updated (or ...Corrected)
National Weather Service (city)(state)
(Issuance time) AM/PM (local time zone)(day)(date)

For waters within five nautical miles of shore on lake (name)

(areal UGC code[s])-(expiration time)-
(Forecast area descriptor[s])
(Issuance time) am/pm (local time zone)(day)(date)

Reason for update/correction.

...HEADLINE(S)... (If needed)

PERIOD
1… etc.

Figure 4. Unscheduled Nearshore Marine Forecast (NSH) Format

4.5 Updates, Amendments and Corrections

NSHs will be updated when the on-duty forecast team believes the current forecast is not representative. WFOs will correct NSHs for format and grammatical errors. Forecasters will update NSHs when a Tornado Watch or Severe Thunderstorm Watch has been issued.

5 Watch County Notification (WCN)

See NWSI 10-511 for more information about issuing WCNs. Great Lakes WFOs with Severe Thunderstorm / Tornado Watch responsibility for marine open lake zones will notify the responsible open lake WFO to ensure the GLF reflects the current status of watches. See NWSI 10-302, Great Lakes section, for WFO marine areas of responsibility for Special Marine Warning (SMW) / Severe Local Storm Watch purposes.

6 Hazardous Weather Outlook (HWO)

See NWSI 10-517 for more information about issuing Hazardous Weather Outlooks (HWO). See NWSI 10-302 Great Lakes section for WFO marine areas of responsibility for HWOs.

7 Centralized Dissemination Systems

See NWSI 10-303, *Marine and Coastal Services Standards and Guidelines*.

APPENDIX A - NWS MAFOR Code for the Great Lakes

NWS MAFOR Code for the Great Lakes
MAFOR YYG$_1$G$_1$ (Name of Lake[a]) (Watches / Warnings[b]) 1GDFmW$_1$[c] (Precipitation[d]) (Ice Coverage[e]) (Wave Forecast[f])

MAFOR YYG$_1$G$_1$ (Name of Lake[a]) (Watch / Warning Headline[b]) 1GDFmW$_1$ [c]

Keyword (Indicating marine forecast)	Day ofthe Month	Time Forecast Period Begins (UTC	Solidus	Name of Lake[a]	Watch/ Warning Headline[b]	@	Forecast Period	Wind Direction	Wind Speed	Forecast Weather
MAFOR	**yy**	**G$_1$ G$_1$**	**/**	**XXXX**	**Plain Language**	**1**	**G**	**D**	**Fm W**	[1]

(Precipitation[d]) (Ice Coverage[e]) (Wave Forecast[f])

Precipitation[d]	Ice Coverage[e]	Wave Forecast[f] (feet)	
Plain Language	**Plain Language**	**Plain Language**	
G - Forecast Period	**D - Wind Direction**	**Fm - Wind Speed**	**W$_1$ - Forecast Weather**
0 - Conditions at the beginning of the forecast period 1 - Valid for 3 hours 2 - Valid for 6 hours 3 - Valid for 9 hours 4 - Valid for 12 hours 5 - Valid for 18 hours 6 - Valid for 24 hours 9 - Occasional	0 - Calm 1 - Northeast 2 - East 3 - Southeast 4 - South 5 - Southwest 6 - West 7 - Northwest 8 - North 9 - Variable	**0 - 5 to 10 Knots** **1 - 10 to 15 Knots** **2 - 10 to 20 Knots** **3 - 15 to 25 Knots** **4 - 20 to 30 Knots** **5 - 35 to 40 Knots** **6 - 40 to 45 Knots** **7 - 50 to 55 Knots** **8 - 56 to 63 Knots** **9 - over 60 Knots**	0 - Moderate or Good Visibility (VSBY) more than 3 nautical miles (nm) 1 - Risk of accumulation of ice on superstructure (Temp 23˚ to 32˚F) 2 - Strong risk of accumulation of ice on superstructure (Temp below 23˚F) 3 - Mist (VSBY 5/8 to 3 nm) 4 - Fog (VSBY < 5/8 nm) 5[d] -Drizzle 6[d] - Rain 7[d] - Snow or Rain/Snow mix 8[d] - Squally weather with or without showers 9[d] - Thunderstorms

a - MAFORS are issued for Lakes Superior, Michigan, Huron, Erie, and Ontario.
b - Headlines are included in Hurricane Force, Storm, Gale, and Heavy Freezing Spray Warnings, and Tornado and Severe Thunderstorm Watches. Note that warning headlines take precedence over watch headlines. Two headlines may be used when one of the headlines is a Heavy Freezing Spray Warning.
c - The 1 group may be repeated as many times as necessary to describe changes in wind and weather conditions expected in a given area during a 24-hr forecast period.
d (1) - If Probability of Precipitation (POP) >= 55% then include precipitation in the code and leave it out of the plain language.

(2) - If 25%>=POP<55% and precipitation is occurring or likely but lowered POP is based on coverage then include the precipitation in the code and leave out of the plain language. However, if POP is based on uncertainty then leave out of code and put in plain language. If other weather types are also forecast then see section 3.3.4b.
(3) - Outside of (2) above, do not use the occasional group for change (25-54%) POPs.
(4) - If POP < 25% then leave out the code. Also leave out of plain language unless “significant” such as thunderstorm or showers (rain or snow) that could greatly reduce visibility.
e - Ice coverage is included as appropriate. If ice coverage is included then wave height information is omitted.
f - Forecast wave height range for valid period of MAFOR (24 hours).

Note: The MAFOR code is not an exact duplicate of the plain-language forecast issued in the Open Lake Forecasts issued for each lake. Mariners should refer to the Open Lake Forecast product for the complete forecast.

APPENDIX B - Examples of Great Lakes Marine Products

Table of Contents

1 Open Lakes example with MAFOR

FZUS61 KBUF 270755
GLFLO

Open Lake Forecast for Lake Ontario
National Weather Service Buffalo NY
355 AM EDT Thu Jun 27 2024

For waters beyond five nautical miles of shore on Lake Ontario.

Waves are the significant wave height - the average of the highest 1/3 of the wave spectrum. Occasional wave height is the average of the highest 1/10 of the wave spectrum.

.SYNOPSIS...A 30.0 inch high over the Upper Great Lakes will build across the Lower Great Lakes through tonight, then will slide out across New England on Friday. A 29.7 inch low will then track from the Upper Mississippi Valley to Quebec Friday night through Sunday with another cold front crossing the region between later Saturday night and Sunday morning. A 30.3 inch high will then build across the Great Lakes on Monday.

LOZ062-271515-
Lake Ontario open waters from the Niagara River to Hamlin Beach-
355 AM EDT Thu Jun 27 2024

.TODAY...Northwest winds 10 to 15 knots becoming west. Waves 1 to 3 feet.
.TONIGHT...West winds 5 to 15 knots becoming northeast less than 10 knots. Waves 2 feet or less.
.FRIDAY...Southeast winds 5 to 15 knots becoming east. Waves 1 foot or less building to 1 to 3 feet.
.FRIDAY NIGHT...East winds 15 to 20 knots becoming south 5 to 15 knots. A chance of showers overnight. Waves 1 to 3 feet.
.SATURDAY...South winds 10 to 15 knots becoming southwest. Showers with a chance of thunderstorms. Waves 1 to 2 feet building to 2 to 4 feet.
.SUNDAY...West winds 15 to 20 knots becoming northwest 10 to 15 knots. Waves 2 to 4 feet building to 3 to 5 feet, then subsiding to 2 to 4 feet.

.MONDAY...North winds 5 to 15 knots becoming southeast less than 10 knots. Waves 1 to 3 feet subsiding to 1 foot or less.

Winds and waves higher in and near thunderstorms.

$$

LOZ063>065-271515-
Lake Ontario open waters from Hamlin Beach to the Saint Lawrence River-
355 AM EDT Thu Jun 27 2024

.TODAY...Northwest winds 10 to 15 knots becoming west 15 to 20 knots. Waves 1 to 3 feet building to 2 to 4 feet.
.TONIGHT...West winds 15 to 20 knots becoming east 5 to 15 knots. Waves 2 to 4 feet subsiding to 1 to 3 feet.
.FRIDAY...Southeast winds 5 to 15 knots becoming east. Waves 2 feet or less.
.FRIDAY NIGHT...East winds 10 to 15 knots becoming south 15 to 20 knots. Waves 1 to 3 feet.
.SATURDAY...South winds 15 to 20 knots becoming southwest 10 to 15 knots. Showers with a chance of thunderstorms. Waves 2 to 4 feet building to 3 to 5 feet, then subsiding to 2 to 4 feet.
.SUNDAY...West winds 15 to 20 knots becoming northwest 10 to 15 knots. Waves 2 to 4 feet building to 3 to 5 feet, then subsiding to 2 to 4 feet.
.MONDAY...North winds 5 to 15 knots becoming southwest less than 10 knots. Waves 1 to 3 feet subsiding to 1 foot or less.

Winds and waves higher in and near thunderstorms.

$$

LOZ061-271515-
MAFOR 2709/
ONTARIO WEST 1/2 12710 13610 11710 11800 11100. Waves 1 to 3 feet.

ONTARIO EAST 1/2 13710 11610 11620 11710 11800 11100. Waves 1 to 3 feet building to 2 to 4 feet today. Waves 2 to 4 feet subsiding to 1 to 3 feet tonight.

$$

2 Nearshore Marine Forecast extending out to five days:

FZUS53 KMQT 242242
NSHMQT

Nearshore Marine Forecast

National Weather Service Marquette MI
641 PM EDT Mon Jun 24 2024

For waters within five nautical miles of shore.

Waves are the significant wave height - the average of the highest 1/3 of the wave spectrum. Occasional wave height is the average of the highest 1/10 of the wave spectrum.

LMZ221-248-250-250800-
Green Bay North of line from Cedar River MI to Rock Island Passage-
Seul Choix Point to Point Detour MI-
5NM East of a line from Fairport MI to Rock Island Passage-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM 2 AM EDT TUESDAY THROUGH WEDNESDAY AFTERNOON...

.LATE THIS AFTERNOON...South wind 5 to 15 knots. Mostly sunny. Waves calm to 1 foot.
.TONIGHT...South wind 10 to 20 knots. Partly cloudy through late evening, then mostly cloudy with a chance of showers and thunderstorms by midnight. Cloudy with showers likely and a chance of thunderstorms late. Waves building to 2 to 4 feet.
.TUESDAY...Southwest wind 10 to 20 knots veering west 10 to 15 knots late. Partly cloudy. A slight chance of showers and thunderstorms through mid morning. Waves subsiding to 2 to 3 feet.
.TUESDAY NIGHT...Northwest wind 10 to 15 knots veering north after midnight. Mostly clear. Waves subsiding to 1 to 2 feet.
.WEDNESDAY...North wind 10 to 15 knots. Partly cloudy with a slight chance of showers. Waves 1 to 2 feet.

$$

LSZ240-241-250800-
Saxon Harbor WI to Black River MI-
Black River to Ontonagon MI-
641 PM EDT Mon Jun 24 2024 /541 PM CDT Mon Jun 24 2024/

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY AFTERNOON THROUGH TUESDAY EVENING...

.LATE THIS AFTERNOON...South wind less than 10 knots. Mostly cloudy. Waves calm to 1 foot.
.TONIGHT...South wind 10 to 15 knots veering southwest late. Gusts up to 23 knots. Partly cloudy through late evening then becoming mostly cloudy. Showers likely and a chance of thunderstorms through the night. Patchy fog late. Waves building to 1 to 2 feet.
.TUESDAY...West wind 15 to 20 knots with gusts up to 30 knots. Sunny. Waves building to 2 to 4 feet.

.TUESDAY NIGHT...Northwest wind 10 to 15 knots with gusts up to 24 knots veering northeast after midnight. Partly cloudy. Waves subsiding to 1 to 2 feet.
.WEDNESDAY...Northeast wind 5 to 15 knots backing north less than 10 knots in the afternoon. Partly cloudy. A slight chance of showers in the morning. Waves 1 to 2 feet.

$$

LSZ242-243-250800-
Ontonagon to Upper Entrance of Portage Canal MI-
Upper Entrance of Portage Canal to Eagle River MI-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH TUESDAY EVENING...

.LATE THIS AFTERNOON...East wind less than 10 knots. Partly cloudy. Waves calm to 1 foot.
.TONIGHT...South wind 10 to 15 knots veering southwest late. Gusts up to 22 knots. Partly cloudy through late evening then becoming cloudy. A chance of showers and thunderstorms by midnight. Waves building to 1 to 2 feet.
.TUESDAY...West wind 15 to 20 knots with gusts up to 31 knots. Mostly sunny. Waves building to 3 to 6 feet occasionally to 8 feet, then subsiding to 3 to 5 feet occasionally to 7 feet.
.TUESDAY NIGHT...North wind 10 to 15 knots veering northeast less than 10 knots after midnight. Gusts up to 25 knots. Mostly clear in the evening then becoming mostly cloudy. Waves subsiding to 2 to 3 feet.
.WEDNESDAY...North wind less than 10 knots backing northwest in the afternoon. Mostly cloudy with a slight chance of showers in the morning, then mostly sunny in the afternoon. Waves subsiding to 1 to 2 feet.

$$

LSZ244-245-250800-
Eagle River to Manitou Island MI-
Manitou Island to Point Isabelle MI-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH LATE TUESDAY NIGHT...

.LATE THIS AFTERNOON...Southeast wind less than 10 knots with gusts up to 19 knots. Partly cloudy. Waves calm to 1 foot building to 1 to 2 feet.
.TONIGHT...South wind 10 to 20 knots veering southwest 10 to 15 knots late. Partly cloudy through late evening then becoming mostly cloudy. A chance of showers and thunderstorms by midnight. Showers likely and a chance of thunderstorms late. Waves building to 2 to 4 feet, then subsiding to 2 to 3 feet.

.TUESDAY...West wind 15 to 25 knots with gusts up to 33 knots. Mostly sunny. Waves building to 3 to 6 feet occasionally to 8 feet.
.TUESDAY NIGHT...Northwest wind 10 to 20 knots veering north 10 to 15 knots after midnight. Partly cloudy in the evening then becoming mostly cloudy. Waves subsiding to 2 to 3 feet.
.WEDNESDAY...North wind 5 to 15 knots backing northwest less than 10 knots in the afternoon. Mostly cloudy with a slight chance of showers in the morning, then mostly sunny in the afternoon. Waves subsiding to 1 to 2 feet.

$$

LSZ246-250800-
Point Isabelle to Lower Entrance of Portage Canal MI-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH TUESDAY EVENING...

.LATE THIS AFTERNOON...East wind less than 10 knots. Partly cloudy. Waves calm to 1 foot building to 1 to 2 feet.
.TONIGHT...Southeast wind less than 10 knots veering southwest 10 to 15 knots late. Partly cloudy through late evening then becoming mostly cloudy. A chance of showers and thunderstorms by midnight. Showers likely and a chance of thunderstorms late. Waves building to 2 to 3 feet, then subsiding to 1 to 2 feet.
.TUESDAY...West wind 10 to 20 knots with gusts up to 30 knots. Partly cloudy through mid morning then clearing. Waves building to 2 to 3 feet, then subsiding to 1 to 2 feet.
.TUESDAY NIGHT...Northwest wind 5 to 15 knots with gusts up to 28 knots veering north less than 10 knots after midnight. Mostly clear in the evening then becoming mostly cloudy. Waves 1 to 2 feet.
.WEDNESDAY...North wind less than 10 knots in the morning becoming variable. Mostly cloudy with a slight chance of showers in the morning, then mostly sunny in the afternoon. Waves calm to 1 foot.

$$

LSZ247-250800-
Lower Entrance of Portage Canal To Huron Islands MI Including
Keweenaw and Huron Bays-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH TUESDAY EVENING...

.LATE THIS AFTERNOON...Northeast wind less than 10 knots. Partly cloudy. Waves calm to 1 foot.

.TONIGHT...South wind 5 to 15 knots veering southwest 10 to 15 knots late. Gusts up to 22 knots. Partly cloudy through late evening then becoming mostly cloudy. A chance of showers and thunderstorms by midnight. Waves building to 1 to 2 feet.
.TUESDAY...West wind 10 to 20 knots with gusts up to 28 knots. Partly cloudy through mid morning then clearing. Waves building to 2 to 4 feet, then subsiding to 2 to 3 feet.
.TUESDAY NIGHT...Northwest wind 5 to 15 knots with gusts up to 24 knots veering northeast less than 10 knots after midnight. Mostly clear in the evening then becoming mostly cloudy. Waves subsiding to 1 to 2 feet.
.WEDNESDAY...North wind less than 10 knots. Mostly cloudy with a slight chance of showers in the morning, then mostly sunny in the afternoon. Waves calm to 1 foot.

$$

LSZ248-250800-
Huron Islands to Marquette MI-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH TUESDAY EVENING...

.LATE THIS AFTERNOON...Southeast wind 5 to 15 knots. Partly cloudy. Waves 1 to 2 feet.
.TONIGHT...South wind 10 to 15 knots. Partly cloudy through late evening then becoming mostly cloudy. A chance of showers and thunderstorms by midnight. Waves building to 2 to 3 feet, then subsiding to 1 to 2 feet.
.TUESDAY...West wind 10 to 15 knots increasing to 15 to 20 knots by late morning. Partly cloudy through mid morning then clearing. Waves building to 2 to 4 feet, then subsiding to 2 to 3 feet.
.TUESDAY NIGHT...Northwest wind 10 to 20 knots veering north less than 10 knots after midnight. Partly cloudy. Waves subsiding to 1 to 2 feet, then building to 2 to 3 feet.
.WEDNESDAY...North wind less than 10 knots. Mostly cloudy with a slight chance of showers in the morning, then mostly sunny in the afternoon. Waves subsiding to 1 to 2 feet.

$$

LSZ249-250800-
Marquette to Munising MI-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH TUESDAY EVENING...

.LATE THIS AFTERNOON...South wind 5 to 15 knots. Partly cloudy. Waves calm to 1 foot building to 1 to 2 feet.
.TONIGHT...South wind 10 to 15 knots with gusts up to 22 knots. Partly cloudy through late evening then becoming mostly cloudy. A chance of showers and thunderstorms by midnight. Waves 1 to 2 feet.

.TUESDAY...Southwest wind 10 to 15 knots veering northwest 5 to 15 knots by late morning. Gusts up to 23 knots. Mostly cloudy through mid morning then clearing. A slight chance of showers and thunderstorms through mid morning. Waves building to 2 to 3 feet.
.TUESDAY NIGHT...Northwest wind 10 to 15 knots. Gusts up to 23 knots. Mostly clear. Waves building to 2 to 4 feet, then subsiding to 2 to 3 feet.
.WEDNESDAY...North wind less than 10 knots with gusts up to 17 knots. Mostly cloudy with a slight chance of showers in the morning, then mostly sunny in the afternoon. Waves subsiding to 1 to 2 feet.

$$

LSZ250-250800-
Munising to Grand Marais MI-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH TUESDAY EVENING...

.LATE THIS AFTERNOON...Southeast wind 5 to 15 knots. Mostly sunny. Waves calm to 1 foot.
.TONIGHT...South wind 10 to 15 knots with gusts up to 22 knots. Partly cloudy through late evening, then mostly cloudy with a slight chance of showers and thunderstorms by midnight. Cloudy with showers likely and a chance of thunderstorms late. Waves building to 1 to 2 feet.
.TUESDAY...Southwest wind 10 to 15 knots veering west 10 to 20 knots by late morning. Partly cloudy through early afternoon then clearing. A slight chance of showers and thunderstorms through mid morning. Waves building to 2 to 4 feet.
.TUESDAY NIGHT...Northwest wind 10 to 20 knots becoming 10 to 15 knots after midnight. Partly cloudy. Waves 2 to 4 feet.
.WEDNESDAY...North wind 10 to 15 knots backing northwest in the afternoon. Mostly cloudy with a slight chance of showers in the morning, then mostly sunny in the afternoon. Waves subsiding to 1 to 2 feet.

$$

LSZ251-250800-
Grand Marais to Whitefish Point MI-
641 PM EDT Mon Jun 24 2024

...SMALL CRAFT ADVISORY IN EFFECT FROM TUESDAY MORNING THROUGH WEDNESDAY MORNING...

.LATE THIS AFTERNOON...East wind 5 to 15 knots with gusts up to 22 knots. Mostly sunny. Waves calm to 1 foot.
.TONIGHT...South wind 10 to 15 knots. Partly cloudy through midnight, then cloudy with showers likely and a chance of thunderstorms late. Waves building to 1 to 2 feet.

.TUESDAY...Southwest wind 10 to 15 knots veering west 10 to 20 knots by late morning. Mostly cloudy through early afternoon then clearing. A chance of showers and thunderstorms through mid morning, then a slight chance of showers by late morning. Waves building to 2 to 4 feet.
.TUESDAY NIGHT...Northwest wind 15 to 20 knots diminishing to 10 to 15 knots after midnight. Mostly clear. Waves building to 3 to 5 feet occasionally to 7 feet, then subsiding to 2 to 4 feet.
.WEDNESDAY...North wind 10 to 15 knots backing northwest in the afternoon. Partly cloudy. A slight chance of showers in the morning. Waves subsiding to 1 to 2 feet, then building to 2 to 3 feet.

$$

WFO MQT

3 Nearshore Marine Forecast with Optional Synopsis and a Direct to a 3-5 Day Forecast

FZUS53 KDTX 081350
NSHDTX

Nearshore Marine Forecast for Michigan
National Weather Service Detroit/Pontiac MI
946 am EDT Tue Apr 8 2014

For waters within five nautical miles of shore

Waves are the significant wave height - the average of the highest 1/3 of the wave spectrum. Occasional wave height is the average of the highest 1/10 of the wave spectrum.

LHZ422-082100-
Inner Saginaw Bay SW of Point Au Gres to Bay Port MI-
946 AM EDT Tue Apr 8 2014

.REST OF TODAY...Northwest winds 5 to 10 knots. Partly cloudy. Isolated light showers by mid afternoon.
.TONIGHT...Northwest winds 5 to 10 knots. partly cloudy. isolated light showers through midnight.
.WEDNESDAY...West winds 5 to 10 knots...becoming southwest 10 to 15 knots late. Mostly sunny through early afternoon...becoming partly cloudy.
.WEDNESDAY NIGHT...Southwest winds 10 to 15 knots...increasing to 15 to 20 knots after midnight...then diminishing to 10 to 15 knots late. Mostly clear.

Waves omitted due to ice coverage.

See Lake Huron Open Lakes Forecast for days 3 through 5.

$$

LHZ421-082100-
Outer Saginaw Bay SW of Alabaster to Port Austin MI to Inner
Saginaw Bay-
946 AM EDT Tue Apr 8 2014

.REST OF TODAY...North winds 5 to 10 knots. Partly cloudy. Isolated light showers by mid afternoon. Waves 2 feet or less.
.TONIGHT...Northwest winds 5 to 10 knots...becoming north 10 to 15 knots after midnight...then becoming northwest 5 to 10 knots late. Partly cloudy. Isolated light showers through midnight. Waves 2 feet or less.
.WEDNESDAY...West winds 5 to 10 knots...becoming southwest 10 to 15 knots late. Mostly sunny through early afternoon...becoming partly cloudy. Waves 2 feet or less.
.WEDNESDAY NIGHT...Southwest winds 10 to 15 knots...increasing to 15 to 20 knots after midnight. Mostly clear. Waves 1 to 3 feet...building to 2 to 4 feet late.

Wave heights are for ice free areas.

See Lake Huron Open Lakes Forecast for days 3 through 5.

$$

LHZ441-082100-
Port Austin to Harbor Beach MI-
946 AM EDT Tue Apr 8 2014

.REST OF TODAY...Northwest winds 5 to 10 knots. Partly cloudy. Isolated light showers by mid afternoon. waves 1 to 3 feet.
.TONIGHT...North winds 10 to 15 knots...becoming northwest 5 to 10 knots late. Partly cloudy.
Isolated light showers through midnight. Waves 1 to 3 feet.
.WEDNESDAY...Northwest winds 5 to 10 knots...becoming southwest 10 to 15 knots late. Mostly sunny through early afternoon...becoming partly cloudy. Waves 2 feet or less.
.WEDNESDAY NIGHT...Southwest winds 10 to 15 knots...increasing to 15 to 20 knots after midnight. Partly cloudy. Waves 1 to 3 feet...building to 2 to 4 feet late.

See Lake Huron Open Lakes Forecast for days 3 through 5.

$$

LHZ442-082100-

Harbor Beach to Port Sanilac MI-

946 AM EDT Tue Apr 8 2014

.REST OF TODAY...Northwest winds 10 to 15 knots...diminishing to 5 to 10 knots by afternoon. Partly cloudy. Isolated light showers by mid afternoon. Waves 2 feet or less.
.TONIGHT...North winds 10 to 15 knots...becoming northwest 5 to 10 knots late. Partly cloudy.
Isolated light showers through midnight. Waves 1 to 3 feet.
.WEDNESDAY...Northwest winds 5 to 10 knots...backing to the southwest late. Mostly sunny through early afternoon...becoming partly cloudy. Waves 2 feet or less.
.WEDNESDAY NIGHT...Southwest winds 10 to 15 knots...increasing to 15 to 20 knots after midnight. Mostly clear. Waves 1 to 3 feet.

Wave heights are for ice free areas.

See Lake Huron Open Lakes Forecast for days 3 through 5.

$$

LHZ443-082100-
Port Sanilac to Port Huron MI-
946 AM EDT Tue Apr 8 2014

.REST OF TODAY...North winds 5 to 10 knots. Partly cloudy. Scattered light showers by mid afternoon. Waves 2 feet or less.
.TONIGHT...North winds 5 to 10 knots...increasing to 10 to 15 knots after midnight...then diminishing to 5 to 10 knots late. Partly cloudy. Scattered light showers through midnight. Waves 1 to 3 feet.
.WEDNESDAY...West winds 5 to 10 knots. Mostly sunny through early afternoon...becoming partly cloudy. Waves 2 feet or less.
.WEDNESDAY NIGHT...Southwest winds 10 to 15 knots...increasing to 15 to 20 knots late. Mostly clear. Waves 2 feet or less.

See Lake Huron Open Lakes Forecast for days 3 through 5.

$$

LEZ444-082100- Michigan Waters of Lake Erie from Detroit River to North Cape MI-
946 AM EDT Tue Apr 8 2014

.REST OF TODAY...Northwest winds 5 to 10 knots. Partly cloudy. Scattered light showers by mid afternoon. Waves 2 feet or less.
.TONIGHT...North winds 5 to 10 knots. Partly cloudy. Scattered light showers through midnight. Waves 2 feet or less.

.WEDNESDAY...Northwest winds 5 to 10 knots...backing to the southwest late. Mostly sunny. Waves 2 feet or less.
.WEDNESDAY NIGHT...southwest winds 5 to 10 knots...increasing to 10 to 15 knots after midnight. Mostly clear. Waves 1 to 3 feet.

See Lake Huron Open Lakes Forecast for days 3 through 5.

The water temperature at Belle Isle is 36 degrees.

$$

You can obtain your latest National Weather Service forecasts online at www.weather.gov/greatlakes

4 Nearshore forecast with the headline "SMALL CRAFT SHOULD EXERCISE CAUTION"

FZUS53 KGRB 122102
NSHGRB

Nearshore Marine Forecast
National Weather Service Green Bay WI
402 PM CDT Sun May 12 2024

For waters within five nautical miles of the shore on Lake Michigan.

LMZ521-522-130100-
Green Bay south of line from Cedar River to Rock Island Passage and north of a line from Oconto WI to Little Sturgeon Bay WI-Green Bay south of line from Oconto WI to Little Sturgeon Bay WI-
402 PM CDT Sun May 12 2024

...SMALL CRAFT SHOULD EXERCISE CAUTION THROUGH THIS EVENING...

.REST OF THIS AFTERNOON...S wind 10 to 20 kts with a few gusts to around 25 kts. A chance of showers and thunderstorms. Waves 2 to 4 ft.
.TONIGHT...S wind 10 to 15 kts veering NW 5 to 10 kts after midnight. A chance of showers and thunderstorms in the evening. Waves 1 to 3 ft.
.MONDAY...NE wind 5 to 10 kts. Partly cloudy. Waves 2 ft or less.
.MONDAY NIGHT...NE wind 10 to 20 kts. Mostly cloudy in the evening then becoming partly cloudy. Waves 1 to 3 ft.
.TUESDAY...NE wind 10 to 20 kts. Sunny. Waves 1 to 3 ft.