

**NATIONAL WEATHER SERVICE INSTRUCTION 10-312
OCTOBER 6, 2008**

**Operations and Services
MARINE AND COASTAL WEATHER SERVICE PROGRAM, NWSPD 10-3**

GREAT LAKES MARINE SERVICES

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SUMMARY OF REVISIONS: This directive supersedes NWSI 10-312, dated October 4, 2007. This directive includes the following changes:

1. Added short sections for the Watch County Notification Product (WCN) (see section 5) and Hazardous Weather Outlook (HWO) (see section 6), as they relate to Great Lakes Marine Services.
2. Removed all mention and inclusion of Valid Time Event Codes (VTEC) in this directive.
3. Removed the Forecast Time Phrases subsection on NSH.
4. Added new marine watches to the Open Lake Forecast (GLF) and Nearshore Marine Forecast (NSH) sections.
5. Wind forecast height for nearshore was changed from 3 meters to 10 meters to represent wind grids (see section 4.3.6).
6. Removed Small Craft Advisory for Hazardous Seas, Small Craft Advisory for Winds, Small Craft Advisory for Rough Bar, Brisk Wind Advisory from the list of optional advisory headlines in the NSH.
7. Removed Freezing Spray Advisory from the list of optional advisory headlines in the GLF and NSH.

Signed

September 22, 2008

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Date

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 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); Chicago, IL (LOT); 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 Interactive Forecast Preparation System (IFPS) 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, or no later than 1 hour after, 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:

<u>Time Period</u>	<u>Scheduled Issuance Times (UTC)</u>			
Standard Time	0300	0900	1500	2100
Daylight Savings	0200	0800	1400	2000

In the GLF, include forecast periods as shown below. Use the day of the week to describe forecast periods beyond the current day. 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)	1 st Period
Tonight	(6PM to 6AM)	2 nd Period
(Next Day)	(6AM to 6PM)	3 rd Period
(Next Day) Night	(6PM to 6AM)	4 th Period
(Day 3)	(6AM to 6AM)	5 th Period

(Day 3) Night (Optional)	(6PM to 6AM)	6 th 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)	1 st Period
(Next Day)	(6AM to 6PM)	2 nd Period
(Next Day) Night	(6PM to 6AM)	3 rd Period
(Day 2)	(6AM to 6PM)	4 th Period
(Day 2) Night	(6PM to 6AM)	5 th Period
(Day 3)	(6AM to 6AM)	6 th Period
(Day 3) Night (Optional)	(6PM to 6AM)	7 th 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 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 Detroit-Pontiac forecasters will issue the Lake St. Clair Forecast following the format of the GLF. Exceptions: During the period when Nearshore Forecasts (NSHs) are issued, these

forecasters should also include sky conditions and Small Craft Advisories in the Lake St. Clair Forecast.

2.3.4 Synopsis. 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. 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. The most significant headline generally should stand alone. However, forecasters may use more than one headline to indicate multiple threats or worsening conditions.

Refer to NWSI 10-301, *Marine and Coastal Services Abbreviations and Definitions* for definitions of Special Marine, 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 winds gust 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 1/4 nm or less in dense fog and dense smoke.*

Great Lake 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. For wind speeds up to 25 knots, use 5 or 10 knot ranges, rounded to the nearest 5 knots. Thereafter, use a single wind speed (e.g., WINDS TO 30 KNOTS). 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 visibility to 1/4 NM or less, or thunderstorms). Forecasters may use precipitation probability terms "CHANCE", "OCCASIONAL", etc., as defined in NWSI 10-503, *WFO Public Weather Products Specification*. Forecasters may include obstructions to visibility ranging between 1/2 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, include headlines for the following warning:

Heavy Freezing Spray Warning

- 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.

2.4 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).

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(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, 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)

$$
&&STORM (If needed, see section 6)
FORECASTER NAME (OPTIONAL)

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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.

<p>OPEN LAKE FORECAST FOR (NAME OF GREAT LAKE)...UPDATED NATIONAL WEATHER SERVICE (CITY)(STATE) (ISSUANCE TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)</p> <p>REASON FOR UPDATE</p> <p>.SYNOPSIS...TEXT.</p> <p>(AREAL UGC CODE[S])-(EXPIRATION TIME)- (FORECAST AREA DESCRIPTOR[S]) (ISSUANCE TIME) AM/PM (LOCAL TIME ZONE) (DAY) (DATE)</p> <p>...HEADLINE(S) (If needed)...</p> <p>.PERIOD 1... etc.</p>
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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 Open Lake Forecast (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 Mass News Disseminator (MND) Broadcast Line. None.

3.3.2 MND Header. The MAFOR will be appended to the Open Lake Forecast, 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.

At the end of the MAFOR, include a range of waves for the 24-hour period. Note wave changes of greater than 5 feet during this period. The final MAFOR group, 2GWvWv, is used only for the Great Lakes Marine Monitoring (MARMON) program. As such, include coded wave height forecasts for the first 6 hours only.

Only one headline is allowed in the MAFOR. See Appendix A, footnote b, for more information.

3.3.4 GLF MAFOR - Forecast Parameters

- a. Wind (sustained). Use the following for conversion from plain language to the MAFOR code:
 1. 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".
 2. Wind Speed: Use the following to convert wind speed, in knots, from the narrative forecast to the MAFOR code:

<u>Narrative Forecast Value</u>	<u>MAFOR Code</u>
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. When precipitation is “categorical” or “likely”, the forecaster should include it as the last digit of a main group. However, the forecaster should denote “chance” precipitation as a “9” (occasional) group or in plain language remarks after the numerical text.

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 MAFORS by adding the letters “AMD” following the effective starting time. WFOs will correct MAFORS 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. 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 IFPS 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.

Nearshore Marine Forecasts may be issued year round. At a minimum, the NSH will be issued throughout the boating season, typically beginning around April 1 and ending around December 31, dependent on ice conditions on the entrances to each individual Lake. Specific dates are determined by responsible Regions.

If needed, forecasters may include, below period 4 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. Nearshore Marine Forecasts 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:

<u>Time Period</u>	<u>Scheduled Issuance Times (UTC)</u>			
Standard Time	0400	1000	1600	2200
Daylight Savings	0300	0900	1500	2100

In the NSH, include forecast periods as shown below. Use the day of the week to describe all forecast periods beyond the current day. For example, a forecast issued Thursday morning will include: TODAY, TONIGHT, FRIDAY, FRIDAY NIGHT.

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

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

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

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

4.2.4 Valid Time. Nearshore Marine Forecasts 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 Universal Geographic Code (UGC). The NSH will contain marine-based zone UGC codes.

4.3 Technical Description. Nearshore Marine Forecasts will follow the format and content described in this section.

4.3.1 Mass News Disseminator (MND) Broadcast Line. None.

4.3.2 MND Header. The Nearshore Marine Forecast 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 forecasters will issue the Lake St. Clair Forecast following the format of the GLF. Exception: WFO Detroit-Pontiac forecasters should include sky conditions and Small Craft Advisories in the Lake St. Clair Forecast.

4.3.4 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.

Refer to NWSI 10-301, *Marine and Coastal Services Abbreviations and Definitions*, for Small Craft Advisories (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.

- 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 1/4 nm or less in dense fog or dense smoke*.

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 Small Craft Advisory 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. 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 or warnings as appropriate. Winds will be considered gusty when gusts are regularly observed over a time period of more than two hours.

4.3.5 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.

4.3.6 NSH - 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. For wind speeds up to 25 knots, use 5 or 10 knot ranges, rounded to the nearest 5 knots. Thereafter, use a single wind speed (e.g., WINDS TO 30 KNOTS). The terms "BECOMING", "INCREASING", AND "DIMINISHING" may be used when appropriate, but not "DECREASING."

If wave heights are omitted due to ice coverage, the proper hazard type is Brisk Wind Advisory. The Brisk Wind Advisory should use the same regionally determined wind thresholds as the Small Craft Advisory. Use Gale or stronger wind warnings, not Brisk Wind Advisory, for winds exceeding advisory thresholds.

- 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 ¼ 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 1/2 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 headline:

Heavy Freezing Spray Warning

- 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.

4.4 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)(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)

...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)

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.

<p>(WMO ID)(UTC ISSUANCE DATE TIME) (AWIPS ID)</p> <p>NEARSHORE MARINE FORECAST (+ Optional descriptor) ...UPDATED (or ...CORRECTED) NATIONAL WEATHER SERVICE (CITY)(STATE) (ISSUANCE TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)</p> <p>FOR WATERS WITHIN FIVE NAUTICAL MILES OF SHORE ON LAKE (NAME)</p> <p>(AREAL UGC CODE[S])-(EXPIRATION TIME)- (FORECAST AREA DESCRIPTOR[S]) (ISSUANCE TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)</p> <p>REASON FOR UPDATE (or CORRECTION)</p> <p>...HEADLINE(S)... (If needed)</p>
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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. In addition to normal update criteria noted in NWSI 10-303, *Marine and Coastal Services Standards and Guidelines*, forecasters will update NSHs when a Tornado Watch or Severe Thunderstorm Watch has been issued.

5.0 Watch County Notification (WCN). All WFOs providing Great Lakes marine services will issue the WCN to remove marine zones from a Severe Thunderstorm Watch or Tornado Watch area. When a WFO without GLF (see section 2) responsibilities removes marine zones from a Severe Thunderstorm Watch or Tornado Watch, the WFO will notify the WFO with GLF responsibility for that lake so the GLF can be updated as soon as possible to reflect the content in the latest WCN. See NWSI 10-511 for more information about issuing WCNs. See NWSI 10-302 Great Lakes section for WFO marine areas of responsibility for Special Marine Warning/Severe Local Storm Watch purposes.

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

7.0 Great Lakes Storm Summary - (GLSCLE). WFO Cleveland will produce a GLS covering all of the Great Lakes whenever storm or hurricane force winds are observed on any of the Great Lakes and are expected to continue for 6 hours or more. Forecasters should update these summaries every three hours until the storm conditions have ended. Do not include Lake St. Clair as a separate entity in the GLS.

The GLS follows the format as shown in Appendix B. This product is available in industry standard encoding and languages, and may include, but not limited to, ASCII, XML, WML, FTP, and HTML.

8.0 Great Lakes Marine Alert Message (MAW). WFO Cleveland will compile and transmit a MAW whenever storm force or greater winds are included in any portion of any GLF. The WFO issuing the GLF will indicate such winds by including **&&STORM** on the line after the termination symbol following the extended forecast. WFO Cleveland should produce the MAW no later than 30 minutes after such an indicator is detected. The MAW follows the format as shown in Appendix B. This product is available in industry standard encoding and languages, and may include, but not limited to, ASCII, XML, WML, FTP, and HTML.

9.0 Marine Monitoring Message (MARMON). MARMON is an automated product issued by WFO Cleveland which compares Great Lakes observations with the appropriate MAFORs, highlights significant discrepancies, and forwards these to the responsible WFO. The MARMON follows the format as shown in Appendix B. This product is available in industry standard encoding and languages, and may include, but not limited to, ASCII, XML, WML, FTP, and HTML. WFO Cleveland should coordinate MARMON program changes with the other WFOs responsible of Great Lakes services.

10.0 Great Lakes Weather Broadcasts (LAWEB). The LAWEB is an automated round-up of all Great Lakes weather observations distributed every 3 hours by WFO Cleveland. The LAWEB follows the format as shown in Appendix B. This product is available in industry standard encoding and languages, and may include, but not limited to, ASCII, XML, WML, FTP, and HTML.

11.0 Centralized Dissemination Systems. WFO Cleveland maintains the centralized dissemination systems, as discussed in NWSI 10-304, *Marine and Coastal Services Communication/Dissemination*.

APPENDIX A - NWS MAFOR Code for the Great Lakes
NWS MAFOR Code for the Great Lakes

**MAFOR YYG₁G₁ (Name of Lake^a) (Watches/Warnings^b) 1GDFmW1^c
(Precipitation^d) (Ice Coverage^e) (Wave Forecast^f) 2GWv1Wv2^g**

MAFOR YYG₁G₁ (Name of Lake^a) (Watch/Warnings Headline^b) 1GDFmW1^c										
Keyword (Indicating Marine Forecast)	Day of the 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	G₁ G₁	/	XXXX	Plain Language	1	G	D	Fm	W₁
(Precipitation^d) (Ice Coverage^e) (Wave Forecast^f) 2GWv₁Wv₂^g										
Precipitation ^d		Ice Coverage ^e		Wave Forecast ^f (feet)		@	Forecast Period	Wave Height Range (feet)		
Plain Language		Plain Language		Plain Language		2	G	Wv ₁ Wv ₂		
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 (n mi) 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* - Drizzle 6* - Rain 7* - Snow or Rain/Snow mix 8* - Squally weather with or without showers 9* - Thunderstorms * - precipitation group is only included if there is a ≥70% probability of occurrence				

^a - MAFORS are issued for Lakes Superior, Michigan, Huron, Erie, and Ontario.
^b - Headlines are included in Hurricane Force, Storm, and Gale Warnings, and Tornado and Severe Thunderstorm Watches. Note that warning headlines take precedence over watch headlines.
^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 - Precipitation is included only if there is a 50% or greater chance of occurrence.
^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).
^g - Coded wave height forecast for first 6 hours only.

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

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1. Open Lakes and Coded Marine Forecasts.....B-1
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1. Open Lakes and Coded Marine Forecasts.

FZUS61 KCLE 080725
GLFLE

OPEN LAKE FORECAST FOR LAKE ERIE
NATIONAL WEATHER SERVICE CLEVELAND OH
325 AM EDT TUE MAY 8 2007

FOR WATERS BEYOND FIVE NAUTICAL MILES OF SHORE ON LAKE ERIE

.SYNOPSIS...A LARGE AREA OF HIGH PRESSURE...AVERAGING 30.30
INCHES...EXTENDING FROM THE MID ATLANTIC COAST ACROSS THE
EASTERN GREAT LAKES WILL REMAIN NEARLY STATIONARY THROUGH
WEDNESDAY. THE HIGH WILL MOVE EAST WEDNESDAY
NIGHT...ALLOWING A WEAK COLD FRONT TO CROSS LAKE ERIE
THURSDAY NIGHT INTO FRIDAY.

LEZ162>166-081415-
MAUMEE BAY TO RENO BEACH OHIO BEYOND 5 NM OF SHORE-
RENO BEACH TO THE ISLANDS OHIO BEYOND 5 NM OF SHORE-
THE ISLANDS TO VERMILION OHIO BEYOND 5 NM OF SHORE-
VERMILION TO AVON POINT OHIO BEYOND 5 NM OF SHORE-
AVON POINT TO WILLOWICK OHIO BEYOND 5 NM OF SHORE-
325 AM EDT TUE MAY 8 2007

.TODAY...SOUTH WINDS 5 TO 15 KNOTS BECOMING SOUTHWEST. WAVES
2 FEET OR LESS.

.TONIGHT...SOUTH WINDS 5 TO 15 KNOTS. WAVES 2 FEET OR LESS.

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.WEDNESDAY...SOUTH WINDS 10 KNOTS OR LESS BECOMING EAST.
WAVES 2 FEET OR LESS.

.WEDNESDAY NIGHT...EAST WINDS 10 KNOTS OR LESS BECOMING
SOUTH. WAVES 2 FEET OR LESS.

.THURSDAY...SOUTH WINDS 10 KNOTS OR LESS BECOMING NORTHWEST.
CHANCE OF SHOWERS AND THUNDERSTORMS. WAVES 2 FEET OR LESS.

.FRIDAY...NORTH WINDS 10 KNOTS OR LESS BECOMING NORTHEAST.
CHANCE OF SHOWERS AND THUNDERSTORMS. WAVES 2 FEET OR LESS.

.SATURDAY...NORTHEAST WINDS 10 TO 15 KNOTS. WAVES 2 FEET OR
LESS.

\$\$

LEZ061-167>169-081415-

WILLOWICK TO GENEVA-ON-THE-LAKE OHIO BEYOND 5 NM OF SHORE-
GENEVA-ON-THE-LAKE TO CONNEAUT OHIO BEYOND 5 NM OF SHORE-
CONNEAUT OHIO TO RIPLEY NY BEYOND 5 NM OF SHORE-
RIPLEY TO BUFFALO NY BEYOND 5 NM OF SHORE-
325 AM EDT TUE MAY 8 2007

.TODAY...SOUTH WINDS 5 TO 15 KNOTS BECOMING NORTHWEST. WAVES
2 FEET OR LESS.

.TONIGHT...SOUTHWEST WINDS 10 KNOTS OR LESS BECOMING SOUTH
10 TO 15 KNOTS. WAVES 2 FEET OR LESS.

.WEDNESDAY...SOUTH WINDS 10 KNOTS OR LESS BECOMING
NORTHWEST. WAVES 2 FEET OR LESS.

.WEDNESDAY NIGHT...NORTHEAST WINDS 10 KNOTS OR LESS BECOMING
SOUTHEAST. WAVES 2 FEET OR LESS.

.THURSDAY...SOUTH WINDS 10 KNOTS OR LESS BECOMING NORTHWEST.
CHANCE OF SHOWERS AND THUNDERSTORMS. WAVES 2 FEET OR LESS.

.FRIDAY...NORTH WINDS 5 TO 10 KNOTS BECOMING NORTHEAST.
CHANCE OF SHOWERS AND THUNDERSTORMS. WAVES 2 FEET OR LESS.

.SATURDAY...NORTHEAST WINDS 10 TO 15 KNOTS. WAVES 2 FEET OR
LESS.

\$\$

LEZ161-081415-

MAFOR 0809/

ERIE WEST 1/2 12410 11400 11500 13400 11410. WAVES 2 FEET OR
LESS. 220002.

ERIE EAST 1/2 12410 11510 11710 12500 11400 11410. WAVES 2
FEET OR LESS. 220002.

\$\$

2. Nearshore Marine Forecasts:

FZUS53 KMKX 220222
NSHMKE

NEARSHORE MARINE FORECAST
NATIONAL WEATHER SERVICE MILWAUKEE/SULLIVAN WI
922 PM CDT THU APR 21 2005

FOR WATERS WITHIN 5 NAUTICAL MILES OF THE SHORE ON LAKE MICHIGAN

LMZ643>646-220940-
SHEBOYGAN TO WINTHROP HARBOR IL-
922 PM CDT THU APR 21 2005

...SMALL CRAFT ADVISORY REMAINS IN EFFECT THROUGH FRIDAY MORNING...

.TONIGHT...NORTHWEST WIND 15 TO 25 KNOTS BECOMING NORTH.
CLOUDY...THEN BECOMING PARTLY CLOUDY TOWARD MORNING. WAVES 2 FEET
BUILDING TO 2 TO 4 FEET BY MORNING.

.FRIDAY...NORTH TO NORTHEAST WIND 15 TO 25 KNOTS EARLY....THEN
NORTHEAST 10 TO 20 KNOTS. MOSTLY SUNNY. WAVES 3 TO 4 FEET.

.FRIDAY NIGHT...NORTH WINDS 10 TO 15 KNOTS. CLEAR. WAVES 2 TO 4
FEET.

.SATURDAY...NORTH WIND AROUND 10 KNOTS. PARTLY CLOUDY. WAVES 1 TO 3
FEET.

\$\$

SEE LAKE MICHIGAN OPEN LAKE FORECAST FOR SUNDAY THROUGH TUESDAY.

HENTZ

3. Great Lakes Storm Summary:

FZUS71 KCLE 022133
GLSCLE

SPECIAL GREAT LAKES MARINE STORM REPORT
NATIONAL WEATHER SERVICE CLEVELAND OH
1030 AM EST SUN JAN 16 2000

STORM REPORT NUMBER 3...1030 AM EST JAN 16

A...STORM LOCATION
STRONG STORM 45.2 N 74.4 W (NEAR OTTAWA)

B...STORM MOVEMENT
LOW MOVING NE 20 KT

C...HIGHEST REPORTED SUSTAINED WINDS OVER THE LAST 3 HOURS
AS OF 10AM EST/9AM CST

LAKE	LAT	LON	LOCATION	DIR/SPD	GUST
SUPERIOR	4655	8738	MARQUETTE CG MI	330/50	65
MICHIGAN	4375	8769	SHEBOYGAN BRKWTR WI	330/40	50
HURON	4472	8327	STURGEON PT MI	280/35	45
	4374	8173	GODERICH ONT	340/30	39
ST CLAIR	4230	8270	BELLE RIVER ONT	320/23	
ERIE	4255	8005	LONG POINT ONT	240/30	
ONTARIO	4322	7922	PORT WELLER ONT	210/20	
	4380	7690	CANADIAN BUOY	270/23	

D...STORM INTENSITY TREND
LITTLE CHANGE NEXT 3 HOURS

E...CURRENT WARNINGS
LAKE SUPERIOR...WARNING - STORM
LAKE HURON...WARNING - STORM
LAKE MICHIGAN...WARNING - GALE

F...REMARKS
NEXT STORM REPORT WILL BE ISSUED BY WFO CLEVELAND AT 1:30 PM EST.
\$\$
GARNET

4. Great Lakes Marine Alert Message:

FZUS61 KCLE 170230
MAWCLE

GREAT LAKES MARINE WEATHER BROADCAST
NATIONAL WEATHER SERVICE CLEVELAND OH
1029 PM EDT WED APR 16 2003

ALERT...STORM FORCE WINDS (48 KNOTS OR GREATER) ARE POSSIBLE IN
LAKE(S):

SUPERIOR
MICHIGAN

SEE THE LATEST OPEN LAKES FORECAST.

\$\$

5. Great Lakes Weather Broadcast:

SXUS20 KCLE 071002
OMRGL2

GREAT LAKES MARINE WEATHER BROADCAST
NATIONAL WEATHER SERVICE CLEVELAND OH
459 AM EST WED MAR 7 2001

WIND SPEED IN KNOTS..WAVE HEIGHT IN FEET..VISIBILITY IN MILES
F=FOG H=HAZE R=RAIN S=SNOW L=DRIZZLE T=THUNDERSTORM D=DUST
Z=FREEZING LAKE

ST.CLAIR	0400 EST	0300 EST
STATION	WIND GUST WAVE VSBY/WX	WIND GUST WAVE VSBY/WX

LAKE ERIE	0400 EST	0300 EST
STATION	WIND GUST WAVE VSBY/WX	WIND GUST WAVE VSBY/WX
Dunkirk Beach NY	240/11 11	240/11 12
Clevlnd Lakeft AP OH	310/15	320/16
Lorain Lighthouse	MMM/MM 0	
South Bass Island OH	320/15 16	320/17 19
Fairport Lighthouse	MMM/MM 0	
Rondeau ONT	320/ 8	320/ 9
Long Point ONT	290/13	320/16
London ONT	330/ 8	310/ 8

LAKE ONTARIO	0400 EST	0300 EST
STATION	WIND GUST WAVE VSBY/WX	WIND GUST WAVE VSBY/WX
Galloo Island NY	360/16 20	020/14 17
Burlinton Pier ONT	250/ 4	240/ 4
Cobourg ONT	340/ 3	360/ 3
Trenton ONT	320/ 3	330/ 4
Point Petre ONT	350/10	360/10

...BUOY & SHIP OBSERVATIONS, 0400 EST...

LAT	LO	LOCATION	WIND	GUST	WAVE	VSBY	WX
43.8	76.9	11 WSW Main Duck Island	340/14	16	01	3/F	

\$\$

6. Marine Monitoring Message (MARMON):

NOUS71 KCLE 161917
ADAGLM

GREAT LAKES MONITORING MESSAGE
NATIONAL WEATHER SERVICE CLEVELAND OH
217 PM EST THU MAR 16 2006 (1918 UTC 03/16/06)

Message(s) for Lake Erie

THRO1 "Maumee Bay"
1700Z 3/16/6

Wind speed observed at 28 knots gusting to 79 knots
MAFOR forecast: 5-15 knots (code 1)
(The observed wind direction was 360 degrees.)

AWIPS product: CLEBOYCM3. The C-MAN observation is shown here:

THRO1 46/// ///// 10020 40218 58012 91900=

Plain language forecast for this lake:

LEZ160-162145-

OPEN LAKE FORECAST FOR LAKE ERIE
NATIONAL WEATHER SERVICE CLEVELAND OH
925 AM EST THU MAR 16 2006

.SYNOPSIS...A RIDGE AVERAGING 30.10 INCHES OVER THE GREAT LAKES WILL MOVE ACROSS LAKE ERIE TODAY WHILE DISSIPATING. LOW PRESSURE 29.80 INCHES WILL MOVE QUICKLY ACROSS SOUTHERN OHIO THURSDAY NIGHT AND MOVE OFF THE MIDDLE ATLANTIC COAST ON FRIDAY. A LARGE AREA OF CANADIAN HIGH PRESSURE AVERAGING 30.30 INCHES WILL BUILD ACROSS THE GREAT LAKES FRIDAY THROUGH MONDAY.

.THIS AFTERNOON...MAINLY NORTH WINDS 5 TO 15 KNOTS. A CHANCE OF SNOW WEST HALF. WAVES IN ICE FREE AREAS 1 TO 3 FEET.

.TONIGHT...NORTHEAST WINDS 5 TO 15 KNOTS BECOMING NORTH AT 15 TO 20 KNOTS. CHANCE OF SNOW. WAVES BUILDING TO 3 TO 5 FEET.

.FRIDAY...NORTH WINDS 15 TO 20 KNOTS. WAVES 3 TO 5 FEET.

.FRIDAY NIGHT...NORTHWEST WINDS 15 TO 20 KNOTS. CHANCE OF SNOW SHOWERS. WAVES BUILDING TO 3 TO 5 FEET.

.SATURDAY...NORTHWEST WINDS 15 TO 25 KNOTS. CHANCE OF SNOW SHOWERS. WAVES 4 TO 6 FEET.

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.SUNDAY...NORTHWEST WINDS 10 TO 20 KNOTS. WAVES SUBSIDING TO 3 TO 5 FEET.

.MONDAY...NORTHWEST WINDS 5 TO 15 KNOTS BECOMING NORTHEAST AND INCREASING TO 10 TO 20 KNOTS. WAVES 2 TO 4 FEET.

\$\$

MAFOR 1616/

ERIE 11810 11700 12810 13810 12820. A CHANCE OF SNOW WEST HALF THIS AFTERNOON AND A CHANCE OF SNOW FOR THE ENTIRE LAKE TONIGHT INTO FRIDAY MORNING. WAVES IN ICE FREE AREAS 1 TO 3 FEET BUILDING TO 3 TO 5 FEET BY FRIDAY. 220103.

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