NOAA/National Weather Service
Product Description Document

Maximum Wave Height in Great Lakes Open Lake Forecast (GLF)

Part I. Mission Connection

a. **Product Description –** The Open Lake Forecast (GLF) is a text product issued by five primary Great Lakes Weather Forecast Offices (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 (for Lake Superior), Detroit (for Lake Huron), Chicago (for Lake Michigan), Cleveland (for Lake Erie), and Buffalo (for Lake Ontario). These offices issue a daily GLF that is routinely sent four times per day. It is primarily used as a tool for planning purposes to support and promote safe transportation across the Great Lakes. For more information regarding the GLF product, refer to NWSI 10-312.

   The enhancement (the inclusion of the maximum wave height) is being tested at WFOs Chicago (LOT) and Detroit (DTX). The enhancement may be added to the other three WFOs at a later date.

b. **Purpose -** The purpose of this proposal is to enhance the GLF at the primary offices listed in Ia. with the inclusion of the maximum wave height (expressed as occasional wave height) which is the average of the highest 1/10 waves.

   In general, it is assumed that individual wave heights can be described using this distribution, which accounts for these wave heights.

   - (H_f) Most Frequent
   - (H_{ave}) Average
   - (H_s) Significant (currently forecast in the GLF)
   - ($H_{1/10}$) Highest one-tenth (occasional wave height)

c. **Audience –** The target audience is the marine community in general.

d. **Presentation Format** – These additional wave fields will be disseminated within the GLF text products and made available through NOAA Weather Radio (NWR) broadcast and through the web. Currently the presentation of this data appears on the legacy text version of the GLF, via certain web graphics, and will later be added to the point and click pages.

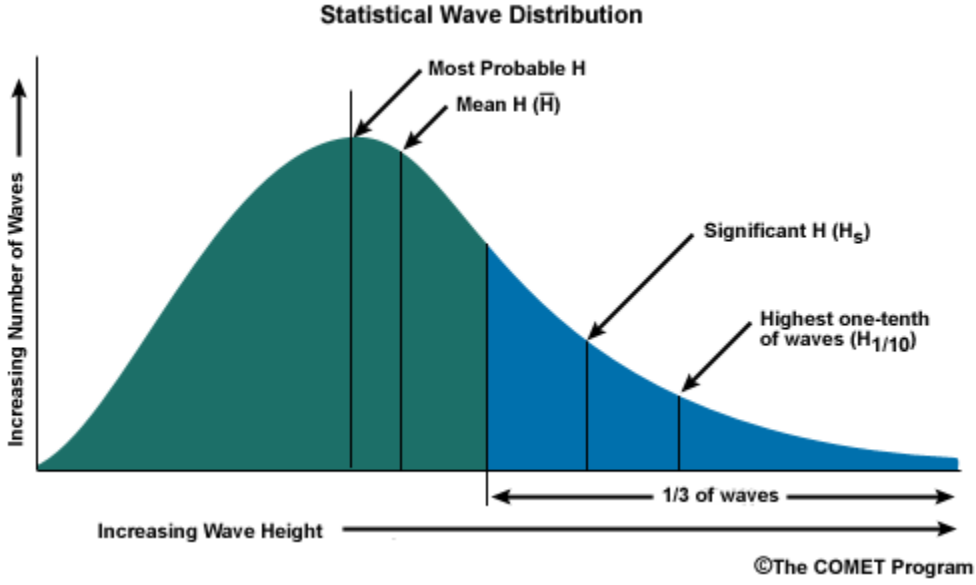
e. **Feedback Method -** Comments regarding this enhancement to the GLF can be provided through the following survey link:
   www.nws.noaa.gov/survey/nws-survey.php?code=EMWHGLF

which will also be advertised in a Public Information Statement. During this experimental period, a proactive effort will be made to educate users and partners of the product availability and use. At the end of the comment period, a decision will be made whether to transition to operational, extend the comment period, or to discontinue the enhancement. If comments are favorable, the GLF will be also evaluated for use at the other primary Great Lakes WFOs and would also be considered for addition to the Great Lakes Nearshore Marine Forecasts (NSH).

Part II. Technical Description

a. Format and Science Basis – Wave Heights in the Great Lakes are modeled according to a wave spectrum. As described above, this distribution accounts for an average value, with most elements or individual wave heights clustered toward the lower values, and only a few exceptionally large values.

Several different wave statistics can be inferred from this distribution. For example, the most frequent wave height (H_f), which is approximately half the value of the significant wave height, and the average wave height (H_{ave}), which is estimated to be about 5/8 the value of the significant wave height.



As shown in Figure 1, the average wave height of the highest 10% of waves observed is approximately ***1.26*** times the significant wave height. The inclusion of H1/10 wave height into the GLF provide a more descriptive and accurate assessment of the wave field expected for any particular time across a given marine zone.

Logistically, this addition could further improve the value of decisions made within the marine community. More important, knowledge of this information could reduce the number of marine incidents and accidents out at sea, saving lives.

b. Product Availability - These additions will be made as part of the routine forecast provided online at the following Central Region WFOs:

WFO LOT http://forecast.weather.gov/product.php?site=lot&product=glf&issuedby=lm
WFO DTX http://forecast.weather.gov/product.php?site=dtx&product=glf&issuedby=lh

and broadcast over the NOAA Weather Radio. The other three WFOs that issue the GLF (Marquette in CR, and Cleveland and Buffalo in ER) may be added at a later date.

c. **Additional Information –** A GFE procedure will automatically create the different statistical gridded wave height information described above from the official NDFD Wave Height forecast. The GLF text formatter also includes the additional wave spectra information. No special software will be necessary to generate these additions.