

Experimental Enhanced Wave Terminology
NOAA/National Weather Service Western Region Weather Forecast Office Eureka, CA and
Eastern Region Weather Forecast Offices

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Part I: Mission Connection

A. Overview

The goal of this project is to provide greater wave detail with more clarity for marine users and partners to support better decision making. Multiple coexisting wave systems are common at any point in the ocean, each containing their own unique height, period and direction. Details on each of these wave systems provide valuable input for marine customers. For example, a very short period wave system moving parallel to the coast may provide significant hazards to small and/or flat bottom vessels leaving an inlet. Meanwhile, longer period waves moving towards the shore produce shoaling hazards near the coast. There are a multitude of similar scenarios that are of interest to various marine users. The point is, no two wave systems are created equal, any wave system present may be hazardous or of interest to different marine groups, and therefore we should not ignore them. More specifically, we need to be providing wave height, period, and direction of the main wave systems present in our marine zones. If we are not, we are ignoring fundamental properties of the sea state, which is both hazardous and missing the demands of the modern marine customer. Now that we have tools such as the Nearshore Wave Prediction System (NWPS) at our disposal, we are poised to make significant improvements to our marine products and services.

Western Region (WR) Weather Forecast Office Eureka, CA (Eureka WFO) has been testing an enhancement to the method for communicating wave information in text products such as the Coastal Waters Forecast (CWF), NOAA Weather Radio scripts, and point-and-click forecasts. The initial test period ran from September 19, 2012 to August 30th, 2013, which has been followed by a series of iterations to incorporate partner and user feedback.

Based on feedback and advancements in NWPS, the proposed wave terminology includes both significant wave height and wave detail components, both including local terminology. The most recent experiment by WFO Eureka found that mariners needed significant wave height as a way to quickly gauge the accuracy of a forecast based on buoy observations. In addition, the experiment found that legacy wave terminology is critical in understanding local marine forecasts. The National Weather Service has several different ways of describing waves at present. Our proposal will accommodate all of those legacy methods, while providing offices with a means to provide invaluable wave detail to their customers.

B. Product Description

Sea state will be described by significant wave height accompanied by as much detailed wave information as is useful for the mariner based on the wave conditions and local needs and

conventions. For example, when there are two distinct waves, then the two waves that make up that sea state will also be described along with the significant wave height. When there is only one wave group present, then only that wave's height, period, and direction will be provided with the significant wave height.

Proposed wave terminology framework

Components:

- (1) Overall significant wave height, with optional mention of possible higher waves
- (2) wave detail (height, period, and direction for one to three waves)
- (3) Customer familiarized term (these are regionally specified)

Structure:

Legend

() = optional and regionally specified

| = division of subcomponents

“ ” = explicit text to be used for that subcomponent

(customer familiarized term) overall sig wave height | “with occasional seas to” overall 1/10 wave height | “Wave Detail:” | (customer familiarized term) direction, height, period + (customer familiarized term) direction, height, period + (customer familiarized term) direction, height, period

Possible customer familiarized terms:

- Seas
- Waves
- Wind Waves
- Swell
- Wind Swell

Transitional customer familiarized term:

Combined wind wave and swell (to be replaced by “wind swell” at some point in the future)

Guidelines:

Each region would select to use a subset of all the format elements and comfort terms based on their local wave climate and long standing customer preferences.

C. Audience

The Enhanced Wave Terminology is targeted toward any marine user in the coastal waters. Users include recreational and commercial mariners, and those responsible for protection of life and property and/or enhancement of the national economy. .

D. Presentation Format

The Enhanced Wave Terminology CWF will maintain consistent daily issuance times in accordance with NWS Policy (NWSI 10-310).. Examples of the Enhanced Wave Terminology

CWF can be seen in Part II Section C, below. Due to the leveraging of wave partitioning in current wave models, the Enhanced Wave Terminology may also be displayed through the use of Hanson Plots as seen below in Part II Section C.

E. Feedback Method

WFO EKA is requesting comments and feedback on the change to Enhanced Wave Terminology. Please feel free to contact us through the following methods.

Web survey – <http://www.nws.noaa.gov/SURVEY/NWS-SURVEY.PHP?CODE=EENWT>

Email – troy.nicolini@noaa.gov and brian.garcia@noaa.gov

Telephone – 707.443.6484

Mail – Attn: Troy Nicolini, National Weather Service 300 Startare Drive Eureka, CA 95501

Beginning in 2020, Eastern Region WFOs Wilmington, NC (ILM), Morehead City/Newport, NC (MHX), Wakefield, Va (AKQ), Mount Holly, NJ (PHI), and New York/Upton, NY (OKX) have local webpages displaying legacy CWF format alongside the proposed Enhanced Wave Terminology CWF and collect feedback through links on the aforementioned webpage, which would send an email to local WFO management.

Part II: Technical Description

A. Science and Methodology

Enhanced Wave Terminology will be produced through the use of partitioned wave data from the Nearshore Wave Prediction System (NWPS) which is fed through a Graphical Forecast Editor (GFE) to create a gridded forecast database. Following the graphical forecast, a text forecast will be created for the web and NOAA Weather Radio.

B. Product Availability

The Enhanced Wave Terminology CWF will maintain consistent daily issuance times in accordance with NWS Policy (NWSI 10-310). Forecast will be available via NOAA Weather Radio and on the web..

C. Additional Information

Examples for regions that currently include overall sea height:

Seas 4 to 6 ft.

Seas 6 ft with occasional seas to 8 ft.

Seas 5 to 7 ft. Wave Detail: NE 5 ft at 5 seconds...and SE 3 ft at 15 seconds.

Seas 6 to 8 ft. Wave Detail: Wind waves S 4 ft at 7 seconds...and swell NW 6 ft at 13 seconds.

Examples for regions that currently provide Wind Wave and Swell:

Wind waves S 4 ft at 7 seconds...and swell NW 6 ft at 13 seconds.

Combined wind wave and swell NW 10 ft at 10 seconds. Swell S 4 ft at 18 seconds. (transitional

approach)

Windswell 10ft at 10 seconds. Swell 4 ft at 18 seconds. (final approach)

Example of Gerling-Hanson plot that shows the same information graphically.

