

PRODUCT DESCRIPTION DOCUMENT

Experimental Tropical Cyclone Surface Wind Speed Probabilities for the North Pacific Ocean in the National Digital Forecast Database

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**Experimental Tropical Cyclone Surface Wind Speed Probabilities (TCSWSP) for the
North Pacific Ocean in the National Digital Forecast Database (NDFD)**

Part I - Mission Connection

- a. Product Description - The NWS provides access to operational and experimental gridded forecasts of weather elements (e.g., maximum temperature, sky cover) through the NDFD. The NDFD contains a seamless mosaic of digital forecasts from NWS field offices working in collaboration with the National Centers for Environmental Prediction (NCEP). The TCSWSP is an NCEP-generated product and is available via the NDFD.

The TCSWSP elements depict probabilities, in percent, of sustained surface wind speeds. These probabilities are provided for wind speed thresholds equal to or exceeding 34-, 50-, and 64-knots. These wind speed probabilities are based on the track, intensity, and storm structure (size in terms of wind radii) uncertainties in the official tropical cyclone forecasts. As of May 15, 2008, TCSWSP elements covering the North Pacific Ocean are available in NDFD in experimental status. Similar elements for the continental U.S. are available in NDFD in operational status. Refer to the Product Description Document entitled “Tropical Cyclone Surface Wind Speed Probabilities in the National Digital Forecast Database” (<http://products.weather.gov/PDD/TCWindSpeedProbNDFD032007.pdf>)

- b. Purpose – These probability elements are used to better convey the uncertainty in forecasts. Customers have requested additional tropical cyclone probabilistic information and the National Research Council’s (NRC) Fair Weather Report encourages probabilistic products.

- c. Audience – A major audience for NDFD gridded data includes large volume users of forecast information, such as utilities, emergency managers, businesses/industry, academia, and any others who wish to decode and explore various potential applications of the NWS digital data.

- d. Presentation Format - The TCSWSP elements in experimental status for the North Pacific Ocean are available through 120 hours at 6 hour temporal resolution and 10 kilometer spatial resolution. A total of six elements are available:

- Tropical Cyclone Wind Speeds >34 kts (incremental)
- Tropical Cyclone Wind Speeds >34 kts (cumulative)
- Tropical Cyclone Wind Speeds >50 kts (incremental)
- Tropical Cyclone Wind Speeds >50 kts (cumulative)
- Tropical Cyclone Wind Speeds >64 kts (incremental)
- Tropical Cyclone Wind Speeds >64 kts (cumulative)

As with all NDFD elements, the TCSWSP elements are available in Gridded Binary Data Edition 2 (GRIB2) via hypertext transfer protocol (http) and file transfer protocol (ftp); eXtensible Markup Language (XML); Geographic Markup Language (GML); and images via web browser, as described below.

1. GRIB2 format: The GRIB2 files can be decoded and converted to other formats, such as shapefiles, netCDF files, etc. A tutorial to download NDFD elements, decode them and generate images is posted online at:

http://www.weather.gov/ndfd/gis/ndfd_tutorial.pdf

The GRIB2 files are available from the NWS ftp server and/or the http server via the Internet. High volume users can also choose to subscribe to the [Server Access Service](#) of the [Family of Services](#) (ftp via dedicated line—cost-recovery fee).

ftp server: http://www.weather.gov/ndfd/anonymous_ftp.htm

http server: http://www.weather.gov/ndfd/access_http.htm

Server Access Svc: <http://www.weather.gov/datamgmt/fos/fospace.html>

A user-defined GRIB2 access method is also available. That service allows the user to input latitude/longitude points for two corners to define an area and select a single weather element. The resulting GRIB2 message is built “on-the-fly” and downloaded by the user. For more information about User Defined GRIB2 access, please refer to the Service Description Document at:

http://products.weather.gov/PDD/User_Defined_Grib2.pdf

2. Extensible Markup Language (XML): Users can request NDFD elements over the Internet using the NDFD XML Simple Object Access Protocol (SOAP) server. The response to the user request is returned in XML format. For more information, please refer to the NDFD XML Service Description Document online at:

http://products.weather.gov/PDD/Extensible_Markup_Language.pdf

and the NDFD SOAP web service web page at:

<http://www.nws.noaa.gov/forecasts/xml/>

3. Geography Markup Language (GML): Users can request NDFD elements over the Internet using the NDFD Web Feature Service (WFS). The response to the user is returned in GML. For more information, please refer to the WFS Service Description Document online at:

http://products.weather.gov/PDD/SDD_NDFD_WFS.pdf

and the NDFD WFS web page at:

http://www.weather.gov/forecasts/xml/OGC_services/

4. NDFD graphics via web browser: During times of tropical cyclone activity, TCSWSP images may be accessed from the NWS homepage (www.weather.gov) by clicking on the “Graphical Forecasts” tab, clicking on the large map of the U.S., then clicking on the

“Tropical” tab in the upper right corner, or *directly* at the following URL:

<http://www.weather.gov/forecasts/graphical/sectors/npacocnTropicalDay.php>

A static example is available at:

<http://www.nhc.noaa.gov/aboutnhcgraphics.shtml>

To access the TCSWSPs and other NDFD elements, or for further technical information (e.g., temporal and spatial resolutions, forecast projections, and geographic coverage), please visit the following URL:

<http://www.weather.gov/ndfd/technical.htm>

e. Feedback Method - The NWS is requesting your comments and feedback from May 15 to November 30, 2009, about this experimental Tropical Cyclone Surface Wind Field product for the North Pacific Ocean. Please feel free to use the links below for submitting comments.

GRIB2 users:

<http://www.weather.gov/survey/nws-survey.php?code=tswd-ndfd-np>

users of XML SOAP service:

<http://www.weather.gov/survey/nws-survey.php?code=xmlsoap>

GML users via Web Feature Service:

<http://www.weather.gov/survey/nws-survey.php?code=ndfd-wfs>

NDFD graphics: <http://www.weather.gov/survey/nws-survey.php?code=gfp>

Technical questions about this probabilistic product may be addressed to:

National Weather Service
Attn: Dr. Richard Knabb
Central Pacific Hurricane Center
2525 Correa Road
Honolulu, HI 96822

or e-mail: richard.knabb@noaa.gov

For general or technical questions or comments regarding the NDFD, please e-mail:
nws.ndfd@noaa.gov .

Technical questions regarding the NDFD may be addressed to:

National Weather Service Headquarters
Attn: David Ruth, W/OST21

1325 East West Highway, SSMC2
Silver Spring, MD 20910

Part II - Technical Description

a. Format & Science Basis - The TCSWSP for NDFD contain two types of probability values: cumulative probabilities and incremental probabilities. Cumulative probabilities are defined as the overall probability the event will occur sometime during the specified *cumulative* forecast period (0 – 6 hours, 0-12, 0-18, etc.) at each specific point. Incremental probabilities are defined as the probability the event will occur sometime during the *specified* forecast period (0 - 6 hours, 6-12, 12-18, etc.) at each specific point. The TCSWSP are based on the track, intensity, and wind structure uncertainties in the official tropical cyclone forecasts. The product provides probabilities of sustained wind speeds equal to or exceeding three wind speed thresholds: 34-, 50- and 64- knots, valid for the cumulative and incremental forecast periods specified above. The product will be updated with each advisory package for each active tropical and/or subtropical cyclone in the North Pacific hurricane basins, which occurs every six hours (except if a special advisory is issued). Probabilistic values change with each forecast advisory package.

b. Product Availability – Products are available no earlier than 15 minutes following the issuance deadlines for routine tropical cyclone advisories (03, 09, 15, and 21 Coordinated Universal Time – UTC) and after special advisories for all tropical and/or subtropical cyclones. These products are sent to the NDFD Central Server and are disseminated from there.

NOTE: Files received at the NDFD Central Server by 45 minutes past the hour will be updated in NDFD near the top of the following hour. Files received after H+45 will be updated in NDFD one hour later.

c. Additional Information

A full description of this and other NWS Tropical Cyclone Weather Services Program products is provided in NWSI 10-601, which is available online:

<http://www.nws.noaa.gov/directives/sym/pd01006001curr.pdf>