



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
1325 East-West Highway
Silver Spring, Maryland 20910-3283

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MEMORANDUM FOR: NWS Regions

FROM: W/OS22 Eli Jacks, <signed>

THROUGH: Digital Services Planning and Action Committee (DSPAC)

SUBJECT: Implementation of Operational Wind Gust Grids

The NWS will transition the NDFD Wind Gust grid to operational status on September 20, 2007 in all CONUS WFOs, and WFOs in Puerto Rico/Virgin Islands, Hawaii, and Guam. This decision was based on an internal technical assessment and customer feedback during the 6 month evaluation period which concluded on March 6, 2007. The information below describes the definition, grid creation methodology and smart tools for the wind gust grids.

WIND GUST DEFINITION

The American Meteorological Society's Glossary of Meteorology defines a wind gust as a sudden brief increase in the speed of the wind. More specifically, the NDFD Wind Gust grid definition accepted by the DSPAC is defined as, **the maximum 3-second wind speed (in knots) forecast to occur within a 2-minute interval at a height of 10 meters. Wind gust forecasts are valid at the top of the indicated hour.** The new definition for NDFD Wind Gust supersedes the definition currently in NWSI 10-506, Digital Data Products/Services Specification.

This new definition has been coordinated across the Public, Marine/Tropical, Aviation and Fire Weather service areas to best meet our diverse user needs. For example, with regard to tropical winds, the 3-second gust definition is preferred by wind engineers for use in building designs. The definition has also been coordinated with the IFPS Science Steering Team (ISST) to ensure technical challenges were addressed, and the National Smart Tools and Smart Initialization Team (STSIT) to guarantee smart tools would be made available to help populate the grids.

The definition is aligned (i.e., on average a near zero bias in most cases) with observational intervals of current wind sensor algorithms. ASOS and buoys employ a 3-5 second average over a 2-10 minute interval. The wind gust forecast is only valid about the top of the indicated hour (i.e., nearest to the time of the hourly observation against which it will be verified). However, the highest temporal resolution in NDFD is 1-hour; therefore, the value is applied to the entire previous hour to ensure there is temporal continuity in the forecast. The new definition will be included in future policy documents.

GRID CREATION METHODOLOGY AND CHANGES FROM NWSI 10-506

The new definition requires 72 hours of Wind Gust grids be populated each hour in the local database with values that equal or exceed the value of the sustained wind speed forecast. **When wind gusts are not forecast for a particular hour, the Wind Gust grid will assume the value of the sustained wind forecast grid.** In other words, the maximum 3-second wind speed is equal to the mean wind speed during that 2 minute interval. This is a change from the current definition in NWSI 10-506 which states the following: “the database will be populated with a zero value and nothing will be displayed in graphic representations if particular gust criterion are not expected”.

Operationally, if a forecaster created a sustained wind speed grid of 10 kts and expected no wind gusts, the Wind Gust grid would assume the value of the sustained wind grid and be populated with a total wind of 10 kts. Conversely, if a forecaster created a sustained wind speed grid of 10 kts , but expected wind gusts up to 25 kts, the Wind Gust grid would be populated with the total wind speed of 25 kts.

GRID POPULATION ASSISTANCE TOOLS

Wind Gust grids have been created by most WFOs for some time. In order to streamline Wind Gust grid production and introduce additional consistency, the following assistance tools are available to the WFO:

1. **National Smart Tool for the Wind Gust Grid** - The STSIT has provided recommended smart tools to correctly populate the Wind Gust grid and perform quality control. WFOs who wish to use this application may download from the National Smart Tool Repository at the following URL: http://www.mdl.nws.noaa.gov/~applications/STR/nstsit_rcmnd.php3
2. **Gridded Model Output Statistics (GMOS)** - GMOS guidance is available to help populate the database with wind gust values utilizing the National Digital Guidance Database. Forecasters can view GMOS wind gust images at <http://www.weather.gov/mdl/synop/gridded/sectors/>
3. **Training** - A training module is available for creating wind gust grids with access on the following DOC Learning Center web site:

<https://doc.learn.com/learncenter.asp?id=178409&page=1&sessionid=3-02003DDB-B8C3-437B-81BF-84EEA97137EF>

4. **NDFD Centralized Grid Integrity Check** - A centralized grid integrity check on the NDFD server has been implemented. The central server sends alerts to the WFOs whenever wind speeds exceed wind gusts.