

Western Region Standardized Sky and Wind Grid Resolution Policy and Methodology

History/Background

The Grid Resolution sub-team of the Wind/Sky grid improvement team was tasked with developing a proposal for standardizing grid lengths for both wind and sky. After much discussion with the full team about ways to improve these grids, we determined that one of the biggest issues with these grids is the inability to compare apples to apples when viewing neighboring ISC grids in the GFE grid manager. The only way to resolve this issue is to agree as a Region on standard time steps that everyone will use when saving and sending grids via ISC.

This sub-team started by asking each office what grid resolution their forecasters typically use when editing wind and sky grids. We also asked what size time blocks each office would like to see at various time steps, and if they had to change to some kind of standard, what impact it would be on their operations. Of the 24 offices in WR, 16 responded to the questionnaire. The attached graphs show the breakdown of time steps used by each of the responding offices for both sky and wind prior to the test. Nobody provided a preference except what they were currently doing. For those offices who responded that they vary the time steps depending on the situation, the lower value was chosen and included in the graphs. For example, if an office said they use 3-6 hr time steps for sky in the first 24 hrs, 3 hrs was chosen for the graph. As you can see, there is some variation between offices, but there is actually a lot of commonality.

Taking into consideration what offices were currently doing, written comments and time steps that seemed reasonable based on the current state of the science, a test was conducted with 5 Western Region offices using the following standardized grid lengths for ISC collaboration between adjacent test offices:

SKY

0-78 hrs – 6 hr time steps

78 hrs – Day 7(8) – 12 hr time steps with break points at 18Z and 06Z

WIND

0-72 hrs – 3 hr time steps

Days 4-7 – 6 hr time steps

The test was conducted during April and was designed to determine the impact on formatter output, workload and collaboration (where test sites were adjacent to each other).

At the completion of the test, forecasters provided feedback on the process and in general, the results were as follows:

Workload – Slight increase in workload

Collaboration – Slight improvement in collaboration

Formatter impact – No significant impact on formatters.

Next Step

Based on those results along with recommendations for improvement suggested by individuals, the team recommended a decrease in the time steps to mitigate the workload increase. The team also recommended an expansion of the test to the entire Region to determine if collaboration could be further improved if all sites in the Region used the same time steps. We realized this may not work for offices bordering Central and Southern Region.

The time steps for the Regional test were as follows:

SKY

0-54 hrs – 6 hr time steps

54 hrs – Day 7(8) – 12 hr time steps with break points at 18Z and 06Z

WIND

0-48 hrs – 3 hr time steps

48 hrs – Day 7(8) – 6 hr time steps

Final Regional Sky/Wind Grid Standard Time Steps Methodology:

The Regional test ran during the months of July and August and was extended through October 2009. During the middle of the test, suggestions were collected by MSD for changes to time steps. There was support to leave the time steps as they were, but there was significant support for changing the extended portion of the SKY grid time steps from a diurnal time step (06Z-18Z and 18Z-06Z) to one that changes seasonally to better line up forecast periods.

Based on this input and some end of the test tweaking, the Grid Improvement team recommended the following grid resolution and time steps for all Western Region WFOs.

SKY

Summer (May 1 – Oct 1)

0-54 hrs – 6 hr time steps

54 hrs – Day 7(8) – 12 hr time steps with break points at 18Z and 06Z

Winter (Oct. 1 – May 1)

0-60 hrs – 6 hr time steps

60 hrs – Day 7(8) – 12 hr time steps with break points at 00Z and 12Z

WIND

0-36 (42) hrs – 3 hr time steps

36 hrs – Day 7(8) – 6 hr time steps

These time steps and grid lengths are to ensure all offices are collaborating on the same grids. Forecasters are welcome to edit in any length that they determine beneficial, but they must have their grids in the agreed upon time steps prior to saving and sending the grids to ISC.

To facilitate keeping grids in the agreed upon lengths, a procedure called Standard_Grid_Times was developed by Ken Sargeant of WFO Medford that combines or splits grids into the agreed upon time steps. It will also check to see if all required NDFD grids are available and with forecaster input add any missing grids.

The best time to split the grids may vary from office to office, or even from forecaster to forecaster based on what methodology they use to edit grids. The grids should be split prior to the midnight and afternoon forecast packages in order to extend the shorter length grids by 12 hours and maintain consistent time steps at all offices. If splitting grids early in a shift results in confusion about whether a grid has already been touched, the best time to run the standard grid length tool may be right before saving the grids and sending them to ISC.

The team recommends that if an office issues routine forecast updates, they not run the tool until after those updates have been issued.

Here are some examples of what the tool will do at various times of the day.

Example 1: The tool is run at 12:01Z on the 4th. You will end up with:

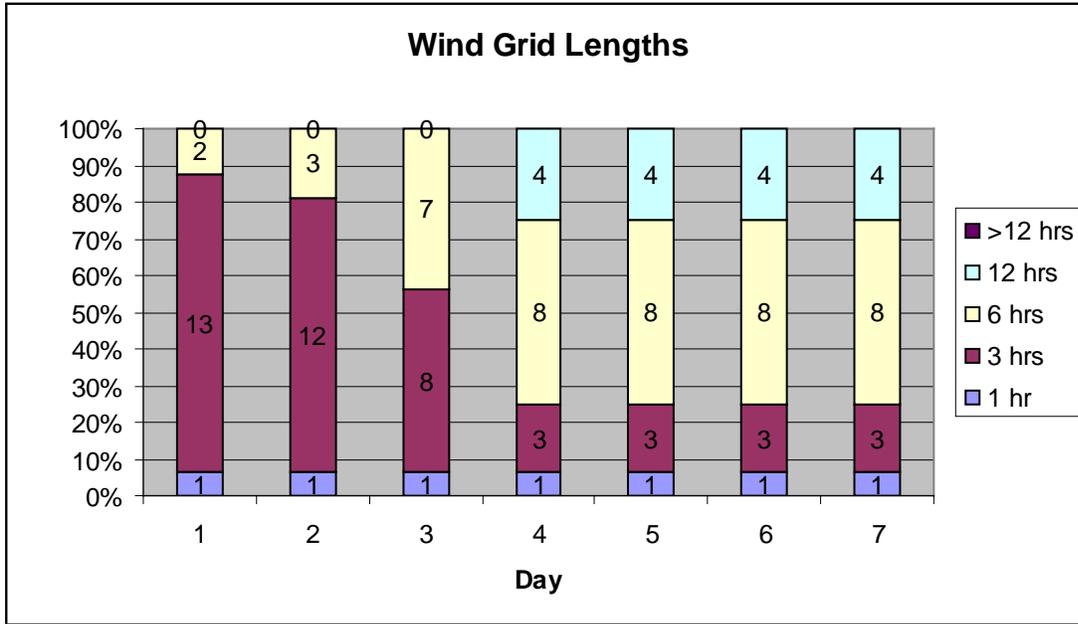
Wind: 48 hrs of 3 hr wind grids (36 hrs from 00Z on the 5th)
Sky (Winter): 60 hrs of 6 hr sky grids (48 hrs from 00Z on the 5th)
Sky (Summer): 66 hrs of 6 hr sky grids (54 hrs from 00z on the 5th)

Example 2: The tool is run at 06Z on the 4th. You will end up with:

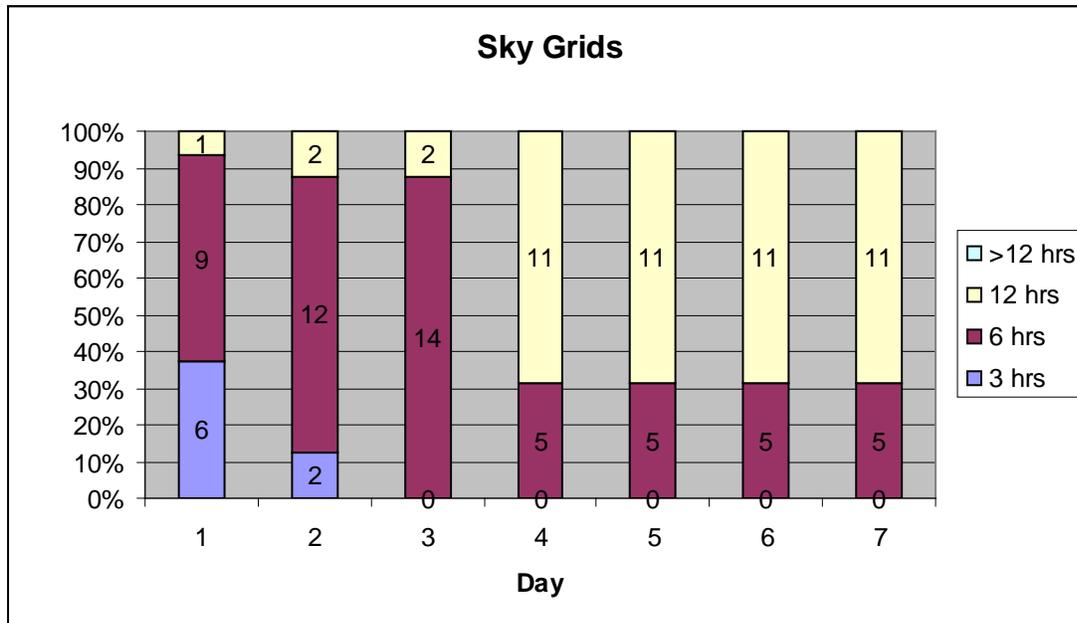
Wind: 42 hrs of 3 hr wind grids (36 hrs from 12Z on the 4th)
Sky (Winter): 54 hrs of 6 hr sky grids (48 hrs from 12Z on the 4th)
Sky (Summer): 60 hrs of 6 hr sky grids (54 hrs from 12Z on the 4th)

The procedure always begins counting at the next 00Z and 12Z to ensure uniform grid length. Forecasters may also want to run the tool after they have stretched or split grids in such a way that those grids no longer conform to the agreed upon time steps.

Additional information on the tool is attached.



The chart above shows the wind (and wind gust) grid lengths currently used by offices around the Region. The color corresponds to the length of grids currently used at various times within the 7 day forecast. The number inside of each bar is an indication of how many offices use that particular grid length.



The chart above shows the sky grid lengths currently used by offices around the region. The color corresponds to the length of grids currently used at various times within the 7 day forecast. The number inside of each bar is an indication of how many offices use that particular grid length.

Standard_Grid_Times Procedure Instructions

The purpose of the Standard_Grid_Times procedure is to set select grids to a standardized time length. The procedure creates shorter grid lengths for the short term forecast and longer grid lengths for the extended forecast. The procedure currently sets the following grids to the following lengths:

Grid	Short Term	Extended
Wind	3 hrs through 48 hrs	6 hrs beyond 48 hrs
Wind Gust	3 hrs through 48 hrs	6 hrs beyond 48 hrs
Sky (Warm Season)	6 hrs through 54 hrs	12 hrs beyond 54 hrs
Sky (Cool Season)	6 hrs through 60 hrs	12 hrs beyond 60 hrs

The start time for the standardized grid lengths show above is always 00Z for the afternoon forecast package and 12Z for the midnight forecast package.

-- Using Standard_Grid_Times --

Standard_Grid_Times is designed to be run prior to the major forecast packages in order to add the next 12 hrs of 3 hr wind grids and 6 hr sky grids. It can and should also be run at any other time where the forecaster wants to ensure their grids meet the standardized grid lengths. To run the procedure;

1. Select "Standard_Grid_Times" from the "Populate" pull down menu.
2. Select either "Scratch" or "Previous Period" for how you want new grids to be created. This mainly applies to grids added to the end of the extended forecast period but will also apply anywhere there are missing grids.
3. Click "Run" or "Run/Dismiss"

-- Standard_Grid_Times Results --

Standard_Grid_Times will split grids that are too long and combine grids that are too short or split at the wrong times. Grids that are combined will contain data from the "left most" grid in time. For example, if two 3 hr wind grids are combined into one 6 hr wind grid, the 6 hr grid will contain the data from the "left most" 3 hr wind grid.

Grids that are altered by Standard_Grid_Times will be marked as edited but not saved. In other words, they will be “green”. It will leave grids that don’t need to be altered alone. This makes it easy for the forecaster to tell which grids Standard_Grid_Times altered. Here is an example:



The wind, wind gust and sky grids should be in the standardized grid lengths anytime the grids are saved and sent to ISC and any time they are sent to the web farm, the backup server or the NDFD.