

Baseline Warn-on-Forecast System (WoFS)

WoFS is a rapidly-updating, short-term ensemble analysis and forecast system designed to make predictions of individual thunderstorms. This approach consists primarily of 18 forecast members with 3km horizontal resolution, in what is considered the baseline WoFS.

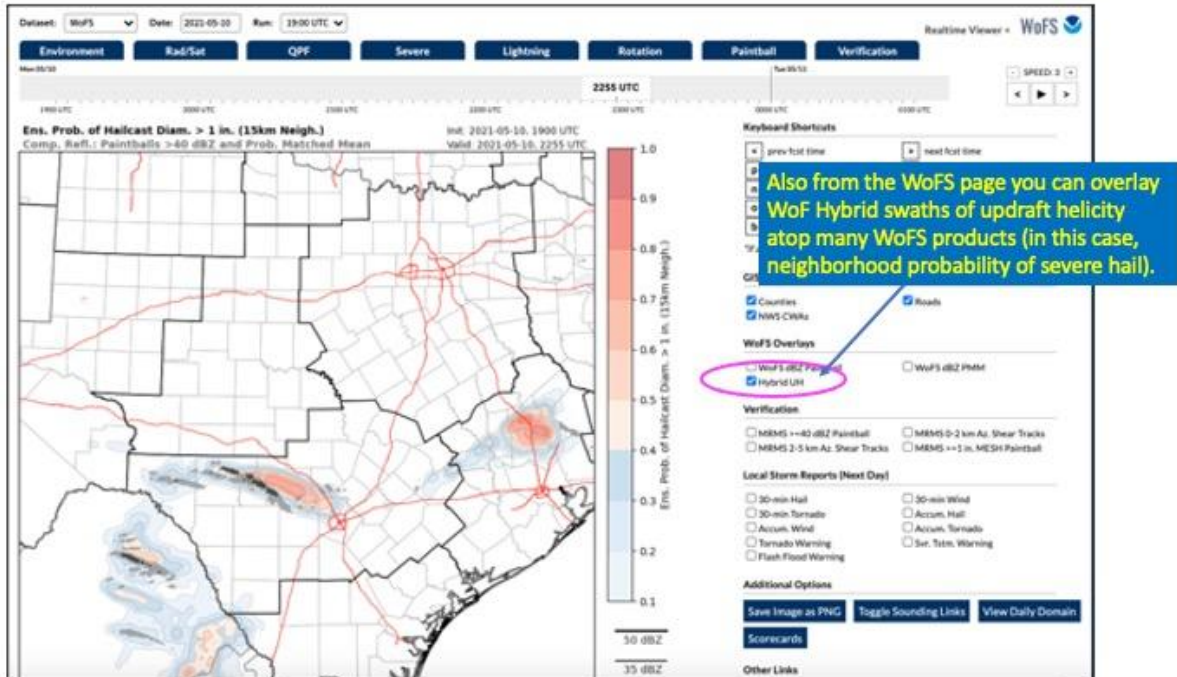
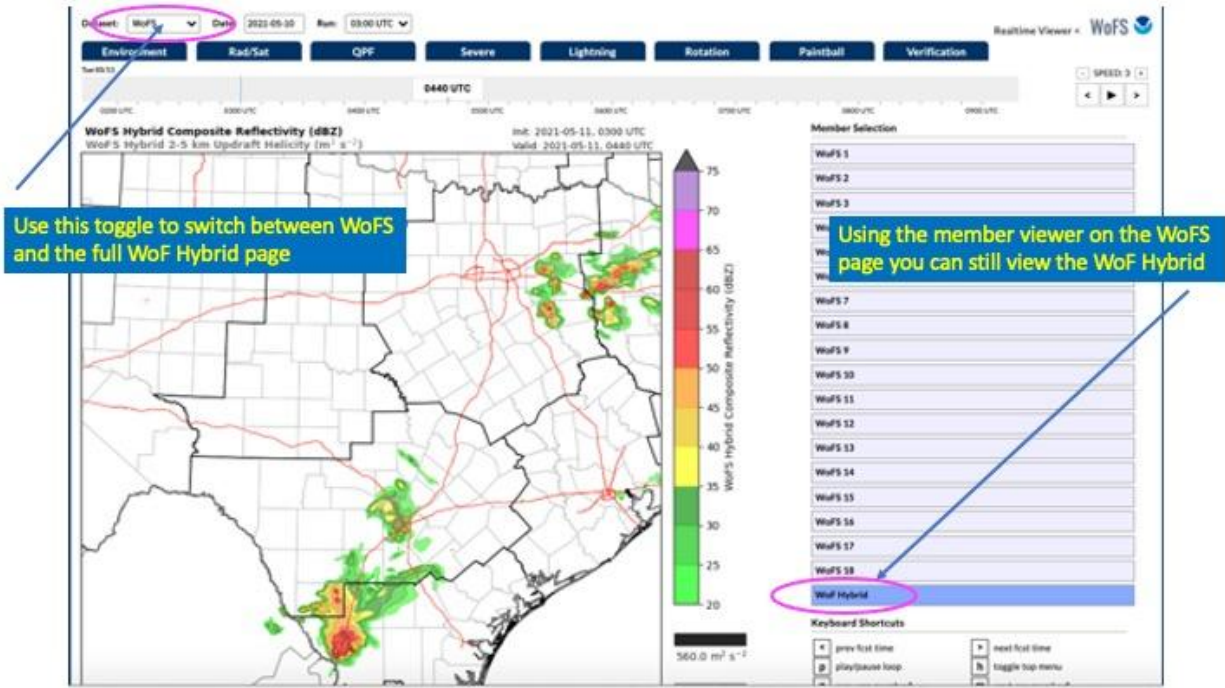
Hybrid Warn-on-Forecast System (WoF Hybrid)

In parallel with the baseline WoFS, there is an additional deterministic forecast member, called WoF Hybrid, which is of higher resolution and is built from a different modeling approach. WoF Hybrid is an efficient, weather-adaptive, hybrid three-dimensional variational and Ensemble Kalman Filter analysis and forecast system ([Gao et al. 2013](#); [Wang et al. 2019](#)). The system incorporates flow-dependent background error covariances estimated from the ensemble forecasts of the baseline WoFS, but provides a 1.5km deterministic analysis and forecast component that can be regarded as a complement to the baseline WoFS. One can think of this as mirroring the way that other coupled model systems attempt to provide one high-resolution, skillful, control forecast member to complement the associated ensemble (e.g., GFS and GEFS).

New on the Web Viewer This Year

In 2021, NSSL would like to raise the visibility of WoF Hybrid and solicit feedback as to the impact of this single, 1.5km deterministic model run on forecast and warning operations. WoF Hybrid, which in past years had a separate home on the WoFS viewer, will this year be incorporated into the baseline WoFS viewer in the following ways:

- WoF Hybrid is Member # 19 on the member viewer (labeled “WoF Hybrid”)
- Contoured updraft helicity swaths from WoF Hybrid may be toggled on or off atop certain plots (use the check boxes on the right-hand side of the viewer).
- Note that WoF Hybrid output is available in 10-minute increments, whereas baseline WoFS plots are available in 5-minute increments.
- You may still use the toggle switch at the upper left to access additional plots from WoF Hybrid. Just remember to toggle back when seeking the complete baseline WoFS plots.

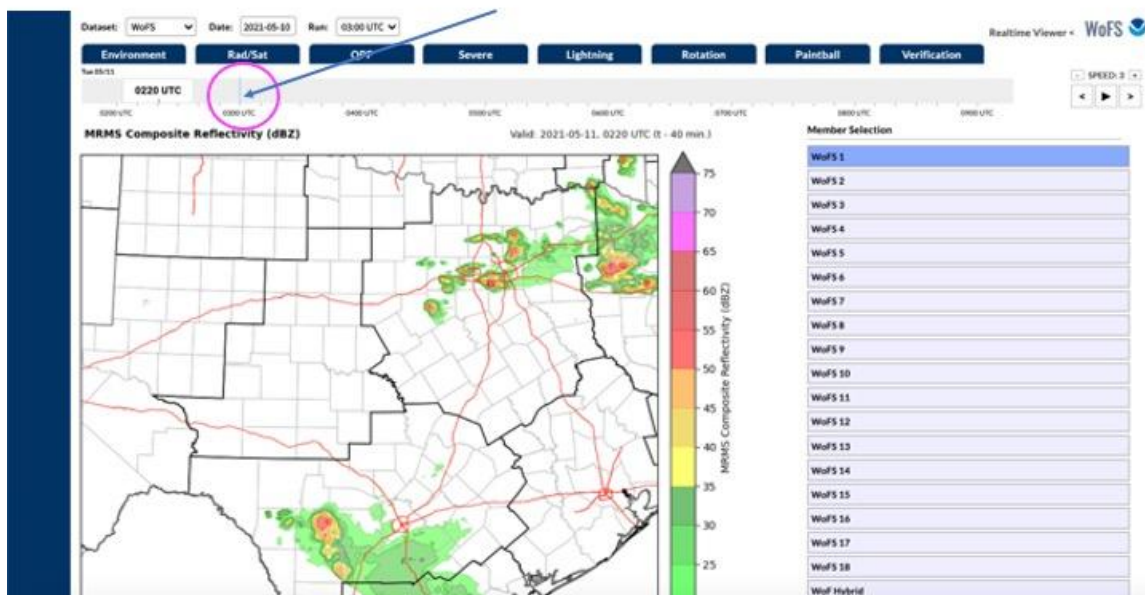


Again, keep in mind that WoF Hybrid is produced in a different manner than the baseline WoF System, and its output is not incorporated into probabilistic fields from the baseline system.

Other changes to the web viewer in 2021, include the following:

- Overlays of the probability matched mean of reflectivity as well as reflectivity paintballs, which traditionally have been hard-wired into many plots, are now optional overlays which the user may choose from the check-box menu on the right-hand side of the page.
- The member viewer includes a backfill of 1-hour of observed radar data from the NSSL Multi-Radar, Multi-Sensor (MRMS) dataset leading up to the time of WoFS initialization. One can scroll along the time bar or press play to watch the real-world storms transition to their projected depiction in the model.

Note that a vertical blue line is located along the timeline / scroll bar at the time of the model run initialization. Images of observed radar data transition to simulated radar data from WoFS as one moves from left to right across that blue line:



- There is now an ability to compare the current WoFS run with the run that occurred 1-hour prior. The method is among the keyboard shortcuts noted on the right-hand side of the web viewer. Press and hold “b” to see data from the previous run (note: does not yet work for the member viewer).
- Overlays of verification data have become more numerous. We hope to make them available more rapidly than in the past, but please check back on a given event during the 1 or 2 days immediately following the event as the National Weather Service receives more storm reports, and they become added to the WoFS viewer.

Please also note, if you are a National Weather Service forecaster the WoFS team will very much appreciate your answering a few simple questions in the [NWS Forecaster Feedback survey](#) at the end of each WoFS day. Thank you!