Purpose

Forecasting near term thunderstorm potential has proven challenging among forecasters because both convection-allowing and parameterized models struggle to pinpoint where and when activity will occur. The suite of parameterized models and MOS guidance sources currently used to generate the near-term forecast often underestimate convective coverage. On the other hand, convection-allowing model Probability of Precipitation (PoP) forecast grids often exhibit extremely high values that are usually displaced slightly in time and space from the observed convection. The CamPoP ("convection-allowing model PoP") smart tool was developed to aid forecasters in determining where and when thunderstorms will occur by using a consensus approach. The tool generates PoP forecast grids showing the percentage of convection-allowing models with non-zero Quantitative Precipitation Forecasts (QPF) in any particular grid box at any particular time. For example, 100% would mean all 8 models and 3 time lagged HRRR runs agree on QPF of 0.01" or greater at a given time and location.

This allows forecasters to zero in on areas of maximum threat for daily convection, and anticipate trends and uncertainty that exist within the forecast using a probabilistic approach. Therefore, CWSU forecasters can express greater confidence in thunderstorm potential to FAA customers for safer and more efficient flight planning.

CamPoP Components

The CamPoP tool is generated by using 8 different convection allowing models and three time lagged HRRR runs to create a consensus of precipitation probability.

CamPoP has since been implemented in the Mojave Desert region and is being run out of the NWS Las Vegas office. The CamPoP grids are generated hourly in GFE and are then converted to web-based images so that meteorologists in Los Angeles CWSU can use them as an extra tool for short term thunderstorm forecasting and daily flight planning.

CamPoP Development

Developed in Greenville-Spartanburg, SC forecast office, the tool quickly became a strong utility for forecasts to assess convection potential. For example, CamPoP was used by WFO GSP to support NASA’s IPHEX (Integrated Precipitation and Hydrology Experiment) in 2014 and received very positive feedback from the NASA team and supported their daily flight planning.

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Limitations & Additional Work

Some limitations of the CamPoP tool include lack of differentiation between non-convective and convective precipitation. Therefore some additional interrogation on the meteorologists part is required to assess the thunderstorm threat. Additionally, the number of available models decreases further in time, so the accuracy can become degraded at longer lead times.

Being an experimental forecasting tool, additional case reviews are required to further assess the CamPoP’s performance.

Case Examples

**August 2nd, 2018**

CamPoP accurately forecasted the areas of greatest storm concentration (shaded areas), while also suggesting more isolated activity (dotted areas).

**July 11th, 2018**

CamPoP accurately forecast the areas of greatest storm concentration (shaded areas), along with the terrain-driven activity further north (dotted areas).

**May 9th, 2017**

CamPoP accurately forecasted the precipitation band across NW Arizona (shaded areas), along with the terrain-driven activity further north (dotted areas).

IPHEx (Intergrated Precipitation and Hydrology Experiment)