Dynamic Ensemble-based Scenarios for IDSS (DESI): A new decision support tool for fast and meaningful interrogation of ensemble-based numerical weather data

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Ensemble-based numerical weather Prediction Systems (EPS) have been around for decades, and have provided forecasters with a wealth of information that can be used to communicate uncertainty, confidence, and other meaningful attributes when providing forecast and decision support information. However, forecasters have rarely been able to take full advantage of this EPS information due to a number of factors including limitations of operational tools, access to the EPS data, as well as cultural and policy-related constraints.

The Dynamic Ensemble-based Scenarios for IDSS (DESI) application has been developed to address the limitations of forecast tools and data access to evaluate Ensemble-based numerical weather Prediction Systems (EPS) information, and in turn can enable a shift in the cultural and policy-related constraints through increased usage of EPS data in operations.

DESI has been designed to handle large EPS datasets and to produce a variety of visualizations of probabilistic information. DESI is web-based and cloud-based, and allows any user with a web browser to slice, dice, and inspect data in meaningful ways. This includes but is not limited to basic statistics, percentiles, probability of exceedance, timing information, uncertainty plots, and paintball plots, all of which are customizable and packed into a variety of point and plan view charts. DESI can also identify and distinguish clusters of ensemble solutions to present to the forecaster for evaluating various scenarios found within the EPS members.

Our talk will focus not only on how we developed and designed such an efficient tool, but how DESI is currently being used and evaluated within the National Weather Service. We will also discuss the findings from the NWS's Operations Proving Ground experiment on DESI and how this tool can benefit decision support services provided by operational forecasters. DESI is one of the newest multi-year research to operations projects within the NOAA/NWS and NOAA/OAR and is currently being evaluated at 48 test offices across the country.