



## **Probabilistic forecasts of coupled applications for decision support of testing events at the U.S. Army test ranges**

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A primary responsibility of the U.S. Army Test and Evaluation Command (ATEC) is the testing of military equipment and munitions. In many cases decision support systems (DSSs) are required to help test directors make go/no-go test decisions to ensure no adverse effects to surrounding areas. The ATEC DSSs are based on high-resolution mesoscale NWP model output to drive secondary-application models which depend on meteorological conditions to produce forecasts of quantities of importance for daily decision-making at the test ranges. Examples of specific applications are given, along with accuracy assessments using cases in which observational data are available for verification. An important feature of the DSSs is the inclusion of ensembles of “coupled” forecasts to derive probabilities of exceedence of critical quantities that can be used to help make test decisions. The ensembles can be based on multiple high-resolution mesoscale forecasts if available or on spatial ensembles derived from different soundings extracted from a single meteorological forecast. In most cases, the two approaches give similar results.