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Development and Application of NMC Operational Verification System

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The NMC Operational Verification System constructs a unified verification data environment to realize the unified management and service of the observe, forecast and verification data. The system establishes a standardized and efficient verification operational data process, compatible with multiple data, including MICAPS data, GRIB2 data, NWFD data, automatic station data and other professional meteorological data. It covers dozens of verification operation such as national provincial intelligent grid forecasting, national cities and towns weather forecast, quantitative precipitation forecast, and the air quality forecast in big cities. The verification products are displayed in the spatial distribution, histogram and data table.
On the one hand, the verification results can be provided to the management departments for assessment and evaluation of forecasters from different departments in order to manage, control and optimize the allocation of resources. On the other hand, the forecasters can be provided with evaluation of the forecasting capacity of different spatial and temporal scales of historical weather processes with reference value for future forecasting, so as to improve the forecasting. At the same time, the forecasting capacity of different models can also be provided to the model developers to improve the model. Regular annual monthly verification reports issued by the government, temporary verification reports required for the assessment and evaluation of forecasters are provided by the inspection system.
The NMC Operational Verification System is based on standardization and planning. In the system construction, it emphasizes the unification of norms and interfaces, so as to standardize the basic functions, operational processes, data models and data coding information standards of the system construction, and enhance the expansibility of the system. The system is deployed on three Linux servers, namely Web server, database server and data processing server. By updating and upgrading the system, the efficiency of statistical query results is improved, the interactive response of the inspection system is faster, and the operational process is more complete and standardized.
The system is divided into four functional modules: forecast verification, analysis of verification documents, query and analysis of verification data and management of verification platform. The system organizes and manages all kinds of data effectively, dispatches the verification algorithm uniformly, and is compatible with the new verification methods in the future. The key technologies include standardized data management, open algorithm module management and scheduling, and visual analysis of verification data.
In order to provide a reference for provincial development of relevant verification systems, the specific verification methods of each module and the detailed processing in real-time operation are also described in particular.At the same time, the system provides intelligent grid forecasting of ten-day, month and year by year, as well as comparison of the results of urban weather forecasting, which strongly supports the operational research and development of intelligent grid forecasting products and operational tests.