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Live, remote access to dynamic weather forecasts from geospatial clients

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This paper describes how researchers at Penn State are processing and serving weather forecast data from the National Weather Service and National Oceanic and Atmospheric Agency via an internet map server to more efficiently accommodate the functional and interoperability needs of the modern geospatial community. Users from within business, agriculture, recreation, and especially time critical arenas such as emergency management and disaster prevention, all have a need for rapid access to current weather forecast data.

Often weather forecast outputs are in unique formats, which require processing and conversion prior to use. The services Penn State has developed provide dynamic access to near real-time forecast data for standard geospatial technologies such as desktop GIS, Open Geospatial Consortium compliant clients (including WMS) and standard Web browsers for non-GIS users. The Penn State system includes a combination of a metadata repository, a spatially-enabled relational database and pre-processing routines, which make the access and use of this data seamless and instantaneous for users.

The services Penn State currently provides include three satellite and radar images, fourteen datasets from the National Digital Forecast Database and four datasets from the National Digital Guidance Database, all provided by the National Weather Service. The forecast data includes elements such as temperature, precipitation, wind speed, and air quality, and shows predictions every three hours extending out seven days in most cases. This paper overviews the system architecture and data flow that provide users with easy access to complex and timely weather forecasts.