

# A Portal for Predicting Tornadoes

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**Middleware Technology to Support Science Portals: a Gateway to the Grid**

Tornadoes, hurricanes and other mesoscale weather events exact a large cost in terms of human life and property damage every year. Our current ability to predict these events is not very great. However, recent advances in networking, large-scale simulation capability and radars are about to change all of this. The NSF “Linked Environments for Atmospheric Discovery” (LEAD) project headed by Kelvin Droegemeier of the University of Oklahoma is building a distributed collaboratory to design and test adaptive workflows that will link realtime observations directly with large supercomputer simulations that focus computational power adaptively on very focused regions where important weather events seem likely to occur. Eventually these simulations will be able to dynamically retarget the radars to provide the most accurate data possible back into the simulations. The goal is to use the resources of the computing and instrument Grid well enough that we can predict the exact location of tornadoes well before they happen.



A central component of this is a portal, which allows the researcher to analyze and catalog data, compose experimental and production workflows, launch simulations, and track the progress of computations. According to Droegemeier, “The portal research and development being done by Indiana University, under support from the Department of Energy, is an essential underpinning of the LEAD project. Because LEAD is targeted toward a highly diverse community consisting of researchers, students in grades 6-20, and operational practitioners, it requires a flexible yet powerful portal framework to support a broad spectrum of user needs.”

