



Unidata: A cyberinfrastructure for the geosciences

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Data are the lifeblood of the geosciences. Rapid advances in computing, communications, and observational technologies — along with concomitant advances in high-resolution modeling, ensemble and coupled-systems predictions of the Earth system — are revolutionizing nearly every aspect of our field. The result is a dramatic proliferation of data from diverse sources; data that are consumed by an evolving and ever-broadening community of users and that are becoming the principal engine for driving scientific advances. Data-enabled research has emerged as a Fourth Paradigm of science, alongside experiments, theoretical studies, and computer simulations

Unidata is a data facility, sponsored by the NSF, and our mission is to provide the data services, tools, and cyberinfrastructure leadership that advance Earth system science, enhance educational opportunities, and broaden participation in the geosciences. For more than thirty years, Unidata has worked in concert with the atmospheric science education and research community to develop and provide innovative data systems, tools, techniques, and resources to support data-enabled science to understand the Earth system. In doing so, Unidata has maintained a close, synergistic relationship with the universities, engaging them in collaborative efforts to exploit data and technologies, and removing roadblocks to data discovery, access, analysis, and effective use. As a community-governed program, Unidata depends on guidance and feedback from educators, researchers, and students in the atmospheric and related sciences.

The Unidata Program helps researchers and educators acquire and use earth-related data. Most of the data are provided in "real time" or "near-real time" — that is, the data are sent to participants almost as soon as the observations are made. Unidata also develops, maintains, and supports a variety of software packages. Most of these packages are developed at the Unidata Program Center (UPC), while a few others originated externally, but are modified, maintained, and supported at the UPC. Software provided by Unidata is available at no charge.

The overarching goal embodied in Unidata's strategic plan is the creation of a scientific ecosystem in which "data friction" is reduced and data transparency and ease-of-use are increased. In such an environment, scientists will expend less effort locating, acquiring, and processing data and more time interpreting their data and sharing knowledge.

To accomplish the goals set forth in our strategic plan, Unidata has been working to build and provide cloud-based infrastructure that makes it easy to discover, access, integrate and use data from disparate geoscience disciplines, allowing investigators to perceive connections that today are obscured by incompatible data formats or the mistaken impression that the data they need for their investigations do not exist.