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Building and Sustaining International Scientific Partnerships Through Data Sharing

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Increasingly, the conduct of science requires strong international scientific partnerships and sharing of knowledge, information, and other assets. This is particularly true in the geosciences where the highly coupled nature of the earth system and the need to understand global environmental processes and their regional linkages have heightened the importance of strong collaborations across national and continental boundaries. The climate system, for example, is far too complex a puzzle to be unraveled by individual investigators or nations. As atmospheric science becomes increasingly global in nature and a team effort of networked scientists (e.g., IPCC assessments, THORPEX, and IPY), it is crucial that focus is placed on full, open, reliable and easy access to and sharing of earth system science data.

For the past two decades, the NSF-sponsored Unidata Program Center (UPC) of the University Corporation for Atmospheric Research (UCAR) has been providing the data services, tools, and cyberinfrastructure leadership that advance Earth system science, enhance educational opportunities, and broaden participation.. In an era of increasing data complexity, accessibility, and multidisciplinary integration, Unidata provides a rich set of data services and tools. Beginning as a collection of US-based, mostly atmospheric science departments, the Unidata community has grown to include government agencies and private sector entities, and today that community also transcends international boundaries. The primary reason for the community broadening, which has in large part occurred organically through the free and open exchange of near real-time geo-scientific data and related software, is a recognition that most of today's formidable scientific problems in the geosciences are inherently multidis-

ciplinary and global in character. As articulated in the draft NSF Strategic Plan: FY 2006-2011 (NSF, September 2006), “discovery increasingly requires expertise of individuals from different disciplines, with diverse perspectives, and often from different nations, working together to accommodate the extraordinary complexity of today’s science and engineering challenges.” The document further states, “. . . the ability to develop collaborations that create new value for the partners is often the limiting factor for progress in critical areas of science, engineering and technology.”

The Internet and its myriad manifestations, including the World Wide Web, have amply demonstrated the compounding benefits of a global cyberinfrastructure and the power of networked communities as institutions and people exchange knowledge, ideas, and resources. The Unidata Program recognizes those benefits, and over the past several years it has developed a growing portfolio of international outreach activities, conducted in close collaboration with academic, research and operational institutions on several continents, to advance earth system science education and research. The portfolio includes provision of data, tools, support and training as well as outreach activities that bring various stakeholders together to address important issues, all toward the goals of building a community with a shared vision. The overarching goals of Unidata’s international activities include:

- democratization of access-to and use-of data that describe the dynamic earth system
- building capacity and empowering geoscientists and educators worldwide
- strengthening international science partnerships for exchanging knowledge and expertise
- fostering sustainable cultural changes and regional coalitions that recognize the benefits of data sharing, and

The Unidata Program continues to place high value on the transformational changes and the increasing importance of international scientific partnerships and proposes to continue fostering such collaborations and related efforts toward the building of a globally-engaged community of educators and researchers in the geosciences. The vision for Unidata and the strategic plan that was recently developed are informed by these trends and emphasize the need for continual organic growth of the community both internationally and into other geoscience disciplines.

In this talk, I will present an overview of the scientific, technological, and educational landscape and discuss the how these developments in cyberinfrastructure and data

services are enabling new approaches to solving geoscientific problems and advancing student learning.