Unidata Equipment Awards Proposal to NSF/GEO/ATM

A. Project Summary

Unidata is a program within the University Corporation for Atmospheric Research (UCAR) Office of Programs whose mission is facilitating research and education in the atmospheric and related sciences by providing software and data. Its community comprises a significant number of research and teaching departments in colleges and universities throughout North America. The Unidata Equipment Grants Program, formerly administered by the National Science Foundation (NSF), has promoted growth of the Unidata community and has helped departments throughout this community use Unidata data and software. Because NSF can no longer administer the grants process, the Unidata Program Center proposes to assume this function.

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C. Project Description

What is Unidata?

The Unidata Program Center (UPC) offers software and services that enable universities to acquire and use atmospheric and related data on their own computers, often in real time. The UPC's software and services are available to any US college or university at no cost. Member institutions provide their own computers, network connections, human resources, and other requirements for participation.

Unidata participants are members of a mutually supportive "virtual community"—a nationwide collection of electronically-linked individuals who hold common academic interests in the atmospheric and related sciences and who share similar needs for data and software. These common needs and interests give direction to the UPC, which assesses them through direct exchanges with users, feedback from a users committee (two meetings per year), and occasional surveys of the community. In addition, Unidata's actions and policies are reviewed by a senior advisory committee of community members, the Policy Committee (three meetings per year).

Especially illustrative of Unidata as a community endeavor is the Internet Data Distribution (IDD) system, in which data from various sources are relayed through a network of computers at colleges, universities, and research institutions. Only through cooperation does this system deliver data to all academicians who need them. More than 130 institutions now participate in the IDD. Each day more than 10 GB of data are injected at the sources. Several products per second pass through the relay nodes.

The number of students benefiting from Unidata's resources grows each year, not only because new students cycle through the community's classrooms, but also because the community continues to expand. Results extrapolated from the latest community survey

indicate that tens of thousands of undergraduate and graduate students use Unidata tools in classrooms and research labs each year.

Unidata's primary funding source has always been, the National Science Foundation's Directorate of Geosciences, Division of Atmospheric Sciences (ATM). The connection has been fruitful and productive not only in leveraging use of resources but in creative and scientific realms as well. Among those is the Unidata Equipment Grants program whose emphasis has been the wise use of resources to support research and education in the atmospheric sciences.

What are the Unidata Equipment Grants?

Responding to a request from the Unidata Policy Committee, ATM initiated a grants process in 1989, and in the early 1990s the first grants were awarded. The grants were intended to help Unidata community members make the transition to new ways of receiving and manipulating meteorological data products.

During the 10 years that the grants program existed, nearly 100 institutions requested funds, in amounts as small as $1,200 and as great as $160,000. ATM encouraged universities to provide some amount of matching funds. In addition, recipients were expected to provide adequate administration for maintaining the Unidata systems on their campuses so that the equipment would be adequately maintained to provide services to the recipient institution, as well as the greater Unidata community.

For ten years from 1990 to 2001 (with the exception of 1994), NSF issued RFPs targeting academic institutions engaged in teaching and research in the atmospheric and related sciences asking them to join the Unidata community, or enhance existing Unidata-supported systems on campus by participating in the grants process.

Grant awards have altered the community's structure in substantial ways. These include, but are not limited to:

- Enabling sites to act as IDD data relay nodes. In this role they contribute to the community's infrastructure by distributing data in innovative new ways.
- Creating new or improving existing teaching methodologies. (Reference to Clark *BAMS* article, Using GEMPAK/GARP in Undergraduate Research)
- Creating electronic weather "laboratories" consisting of multiple workstations all running software provided by the UPC.

The above illustrates a few ways in which equipment grant monies have encouraged new members to join and existing members to enhance the community process. This process has contributed in no small measure to the growth and vitality of the Unidata community, which is widely recognized as a model for strong discipline-oriented communities. The Digital Library for Earth-system Education (DLESE) and the National Science Digital Library (NSDL) are examples of communities following in the UPC's footsteps.

Given the importance of the grants program to its community, the Unidata Program Center proposes to assume the role of administering the distribution of funds through a process resembling, but not duplicating, the grants process formerly administered by the National Science Foundation. Its governing committees (see attached members list) strongly supported and encouraged this step.[*]

The UPC will call its process the Community Equipment Awards, and proposes to administer it as follows:

- Issue a Request for Proposal (RFP)
  1. Universities will submit a short proposal and budget justification to the Unidata Program Center on or before a well-publicized deadline.
  2. We anticipate that proposals will be in the $5,000 to $25,000 range.
  3. The RFP will identify the award target or "theme" for that year's awards. (An example might be sites wishing to make their data holdings available by acquiring equipment enabling them to become THREDDS servers.)

- The UPC will appoint an evaluation panel of up to five qualified people to evaluate and rate award proposals based on the pre-determined criteria. The evaluation committee will consist of:
  1. One Unidata staff member
  2. One or two User Committee members
  3. At least one previously successful award recipient
  4. Two from the active community, or groups within UCAR who collaborate closely with Unidata and its community, (COMET, DLESE, NSDL).
- Panel members will be selected based on the "theme" of the given year's RFP.
- Panel membership will remain confidential.
- Panel members will be ineligible for awards during the year of service.
- The preferred method for conducting the evaluations will be by remote interaction (e-mail or telephone-conference); however, should that process prove too cumbersome, the panel will convene in person.

  Proposals will be judged on:

  - **The intellectual merit of the proposed work**. The importance of the proposed activity to advancing knowledge and understanding within the Earth-sciences.
  - **The broader impacts of the proposed activity**. The importance of the activity in promoting teaching, training, and learning within the Earth-sciences.
  - **Contribution to Unidata Community Capabilities.** Potential for the equipment and any associated developments in concepts and software it makes possible to contribute to the enhancement of community capabilities. Commitment to

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[*] Action Item from the October 2001 Policy Committee meeting: The Policy Committee recommends that the UPC write an unsolicited proposal to the National Science Foundation to administer internally the Unidata Equipment Grants process following a careful cost analysis of impacts to the Program.
The Users Committee strongly supported Unidata's implementing the grants process in its October 2001 meeting and again in its February 2002 meeting.

participate in Unidata's community-based support efforts, including but not limited to enhancing or augmenting the IDD system. This includes sites already acting as relay nodes that may need equipment upgrades as well as sites that are well-connected on the network and have the willingness, expertise, and staff to act as relays but lack adequate equipment.

- **Contribution to the advancement of technology.** The UPC may request that proposals show emphasis toward a particular technological advancement that it is working to deploy. For example, it may request proposals that allow users to better access data from community servers using a given methodology such as remote data access methodologies embodied in THREDDS servers.
- **Contribution to Education.** Potential that the proposed equipment will enhance and contribute to local and possibly community education efforts in the atmospheric and related sciences by providing new approaches to classroom and individual instruction.
- **Contribution to Research.** Potential that the proposed equipment will enhance and contribute to local and possibly community-based research programs in progress or being developed; potential for the equipment to support innovative and significant research.
- **System Management Competence.** Technical soundness of the proposal with respect to equipment selection and integration with existing local systems; capability of faculty and staff involved to manage and utilize the proposed equipment; adequacy of the institutional commitment to assist in obtaining, managing, and maintaining the proposed equipment.

With all else being judged equal, small, minority, and first-time requests will be viewed most favorably. While informal cost sharing is desirable, it will not be among the criteria for a successful proposal.

Once decisions are made, the Unidata Director will notify all applicants of the success or failure of their proposals. Reviewers' comments will be distributed to successful and unsuccessful proposals alike.

Funds will be distributed to successful applicants by a sub-contract award process, and recipients will be responsible for purchasing the equipment described in their proposals.

Within a year of receiving equipment funds, recipients will be required to submit an article to the UPC for publication either in the Unidata newsletter, or on the Unidata website. The intent is to encourage others to participate in the Community and the Equipment Awards program by showing the benefits of participating, as well as ensuring compliance with the original intent of the awards.

Failure to submit the requested article will result in ineligibility for future funding.

Timeline:

The RFP will be posted in January with a March 1st deadline. Reviewers will make award decisions prior to the end of spring semester (mid-May). Final awards will be made in September.