

Project Summary

Unidata is a community data facility for the atmospheric and related sciences, established in 1984 by U.S. universities with sponsorship from the National Science Foundation. While its founding mission – making atmospheric science data available to university departments in near real time – has remained central to Unidata’s activities, Unidata’s field of endeavor has grown to encompass a wide range of cyberinfrastructure technologies that make geoscience data more useful and easier for scientists and educators to access. Similarly, Unidata’s member community has grown to include over 700 U.S. universities and colleges, forming a solid core of the more than 3000 educational, government, and research institutions that rely on Unidata technologies worldwide.

Intellectual Merit

In this proposal, we have identified four strategic goals: enabling efficient access to geoscience data, developing tools for effective use of geoscience data, providing community leadership on geoscience cyberinfrastructure issues, and building and supporting a diverse geoscience community. This plan extends the work Unidata has done, addressing emerging issues related to ever-growing data volumes, complexity of data-centric scientific workflows, and IT resource constraints at our member universities.

Our approach to address these issues leverages the advantages of the robust cloud-based computing environments that have emerged in recent years. We plan to evolve and augment existing Unidata technologies with the goals of:

- Reducing the amount of data that must be transferred over computer networks,
- Reducing the complexity of the hardware and software environments our community members must maintain, while
- Increasing the flexibility of investigators to conduct science and extract knowledge from the deluge of geoscience data.

Through these efforts, Unidata will empower its users to tackle multidisciplinary grand challenge problems, develop the profession’s human capacity, and transform the conduct of science.

Broader Impacts

Although Unidata’s core activities focus on serving scientists and educators in the atmospheric and related sciences, virtually every project Unidata undertakes has a broader impact on the geosciences community and society at large. Among the many examples:

- Unidata’s impact on research is evidenced by references to Unidata software and services in more than 1100 scholarly articles in the past 5 years alone. Such impact is expected to continue.
- In education, Unidata has worked to encourage participation by a diverse array of academic institutions beyond its traditional constituency of universities granting degrees in the atmospheric sciences. Over 100,000 students in U.S. colleges and universities from all 31 EPSCoR states and numerous HACU and HBCU institutions are expected to use Unidata’s products and services.
- Unidata-developed cyberinfrastructure will continue to be in wide use among U.S. federal agencies, private industry, and non-governmental and international organizations including NOAA, NWS, NASA, USGS, DOE, DOD, ECMWF, EUMETSAT, CMA, and CPTEC.
- Unidata undertakes a variety of activities with the goal of building a vibrant community in the geosciences and beyond, including mentoring undergraduate students at the Unidata Program Center, holding community workshops and attending scientific meetings, and participating in large-scale community projects such as OGC’s GALEON and NSF’s EarthCube. These collaborative efforts will be sustained during the next five years.