

Minority-Serving Institutions Cyberinfrastructure Institute (MSICI²) Highlight

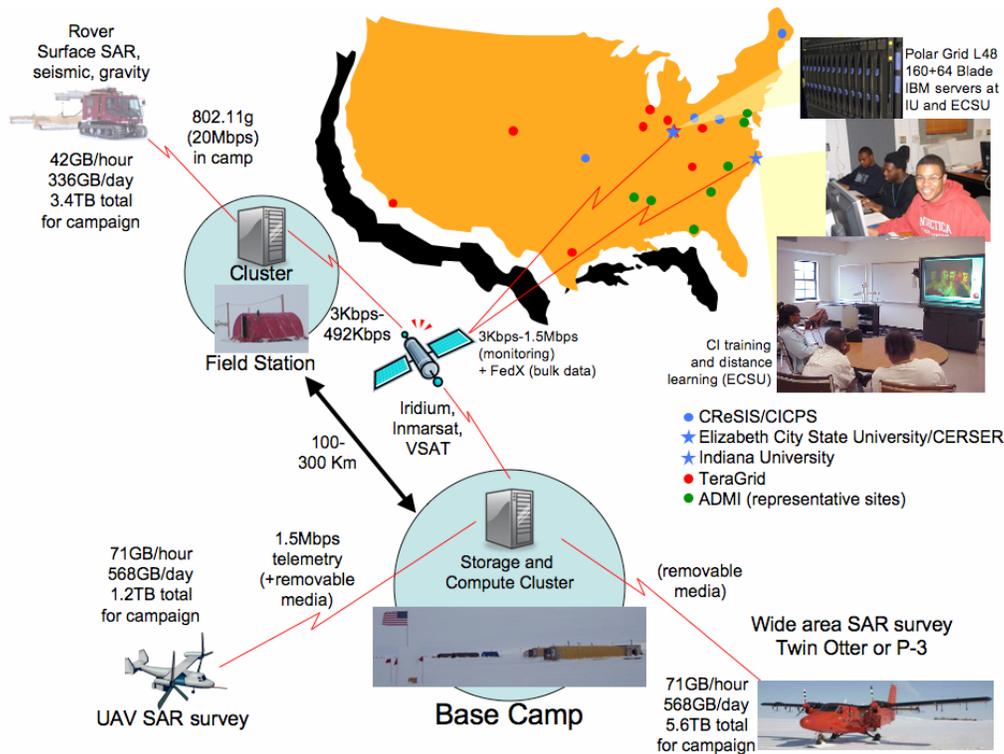


Figure: Polar Grid showing linking of participating institutions to Cyberinfrastructure at ECSU, IU, TeraGrid and (multiple) base and field camps associated with scientific observation expeditions

The Minority-Serving Institutions Cyberinfrastructure Institute (MSICI²) was a NSF CI-Team demonstration project that aimed to broaden participation in Cyberinfrastructure (CI) and use CI as a mechanism to enhance the participation of MSIs in leading edge research and education. We learned several lessons that were described in an article for the TeraGrid06 users meeting and embodied in our follow up proposal, MSI Cyberinfrastructure Empowerment Coalition (MSI-CIEC). Our project was founded on interactions between the leaders of Cyberinfrastructure and the following organizations: the American Indian Higher Education Consortium (AIHEC), the Hispanic Association of Colleges and Universities (HACU), and the National Association for Equal Opportunity in Higher Education (NAFEO). These organizations collectively represent MSIs nationally. Here we describe a particular example illustrating our approach. Elizabeth City State University (ECSU), an HBCU in North Carolina, attended our two meetings hosted at SDSC that described how CI enabled new science. ECSU recognized the value of CI for the collaboration they had with the Center for Remote Sensing of Ice Sheets (CReSIS) which is an NSF Science and Technology center developing new sensors and new models to understand ice sheets. This critical project is motivated by recent polar satellite observations that show disintegration of ice shelves in West Antarctica and speed-up of several glaciers in southern Greenland. The great ice sheets in Antarctica and Greenland interact with the global climate in a complex manner, and the impact on global sea level of their retreat would be profound. Most of the existing ice-sheet models, including those used by the Intergovernmental Panel on Climate Change (IPCC), cannot explain the rapid changes being observed. CReSIS work will enable a new-generation of high resolution ice-sheet models with realistic boundary conditions, but it will

require distributed Cyberinfrastructure to gather and process data and assimilate them with large simulations.

ECSU along with CReSIS and MSI-CIEC collaborators have already taken several steps to develop the PolarGrid CI shown in the picture. A follow up CI-Team proposal has been approved and will develop the PolarGrid Science Gateway linking TeraGrid with CReSIS research. ECSU will offer a CI track in their master's program and their undergraduate and graduate students will be offered CI internships this summer. An ECSU graduate student took the first step with a week at the OGF19 Open Grid Forum meeting during January 29-February 2 of this year. Existing collaborations of ECSU with the Association of Computer/Information Sciences and Engineering Departments at Minority Institutions (ADMI) and MSI-CIEC will bring these opportunities to other MSIs. As a next step, ECSU and Indiana University have proposed an innovative infrastructure that will link intermittently disconnected field and base grids in the polar regions to "lower 48" data and computing resources. This has important hardware and software challenges that will advance CI research and enable new science discoveries. After little more than a year, NSF's MSI CI empowerment program has brought a relatively small HBCU with less than 3000 students to the leadership position in development of CI for an internationally critical science project.