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WORKING PROTOTYPE - EARTH SCIENCE INFORMATION PARTNERS WILL
PROTOTYPE ENVIRONMENTAL INFORMATION FEDERATION CONCEPTS

Working Prototype Earth Science Information Partners (WP-ESIPs) Selected

NASA's Office of Earth Science (OES) has selected two dozen proposals, in two categories, to develop working prototypes of innovative uses and applications of Earth science data and related research. Twelve each of Type 2 and Type 3 Working Prototype Earth Science Information Partners (WP-ESIPs) were selected for the experimental phase of defining, demonstrating and validating the federation approach to performing selected major functions of the EOS Data and Information System (EOSDIS). Selection in both categories was made by Bill Townsend, then Acting Associate Administrator. Awards were announced in December 1997. As of early February of 1998, Cooperative Agreement negotiations for all projects were proceeding quickly.

NASA concluded that ESIPs can best be described as belonging to three types. Type 1 ESIPs are responsible for standard data and information products whose production, publishing/distribution, and associated user services require considerable emphasis on reliability and disciplined adherence to schedules. Type 2 ESIPs are responsible for data and information products and services in support of Earth system science (other than those provided by the Type 1 ESIPs) that are developmental or research in nature, where emphasis on flexibility and creativity is key to meeting the advancing research needs. Type 3 ESIPs are those providing data and information products and services to users beyond the global change research community who enter into joint endeavor agreements with OES.

The WP-ESIP awards respond to a July 1996 National Research Council recommendation that NASA evaluate an alternative implementation of product generation, publication and user services for possible future evolution of EOSDIS, and reflect two of the three envisioned types of ESIPs. (Type 1 ESIP functions are currently performed by the existing Distributed Active Archive Centers for EOS, or, in some cases and for other Earth Science missions, by other NASA-supported project teams.) The evaluation of the federation concept will be initiated beginning with this limited set of prototype projects operating in a federated, rather than a centrally-managed architecture. These Type 2 and 3 WP-ESIPs, together with NASA, will determine the management, system interoperability and organizational interfaces necessary to establish the Working Prototype-Federation. The future-oriented strategy proposed by the NRC is just becoming possible because of the tremendous pace of information technology innovation, and can be seen as comparable to our move toward principal investigator-driven spacecraft.

Type 2 WP-ESIPs are focused on new data and information products or services in support

of global change research that are developmental or research-oriented, with emphasis on flexibility and creativity in meeting advanced scientific applications. The Type 2 ESIPs concept is, in a way, a further development of the evolution of the Pathfinder Data Sets concept, with the additional feature of providing the stewardship for the near-term storage, distribution, and user services portion of the data product management cycle.

The Type 2 WP-ESIPs also have the objective of enhancing innovation and creativity in the provision of environmental information services, and of identifying and testing new or emerging information technologies, techniques and/or approaches which offer promise of significantly reducing the future costs of EOSDIS. It is hoped that marrying these science and technology objectives within the Type 2 WP-ESIPs will promote very close teamwork and interactions between scientists, and system designers and implementers, resulting in highly effective science data centers.

From 50 Type 2 proposals submitted, NASA has selected three proposals focusing on land-cover and land-use change issues, three proposals focusing on oceanography or hydrology, three proposals concentrating on atmospheric research data, and three proposals that integrate interdisciplinary issues, including one on environmental factors in public health. Two proposals have a U.S. regional focus.

Type 3 ESIPs will be responsible for extending the benefits of NASA Earth science data and information beyond basic research to a broader user community including private industry, value-added companies, state and local governments, and non-profit organizations. NASA required that all for-profit organizations must cost-share at at least the 50% level. Successful Type 3 ESIP organizations are expected to become financially self-sustaining by the end of their nominally 5-year projects. The participation of Type 3 WP-ESIPs in the Working Prototype-Federation will test the flexibility and extensibility of such a system.

From 65 Type 3 proposals submitted, NASA has selected 12 proposals that cover roughly 15 scientific disciplines: Five proposals deal with regional applications; three proposals focus on agriculture; two proposals focus on coastal and marine applications; three proposals deal with education and public outreach; and two proposals provide special applications to extend MTPE data to non-Earth science research communities.

NRC to hold Federation Workshop in late February

The National Research Council's (NRC's) "Workshop on a Federated EOSDIS" will be held on February 23 -25, 1998 in the Washington D.C area. There will be about 70 participants in the 3-day workshop, including invitations for all Project Leaders of the 24 projects selected to participate in NASA's Working Prototype Earth Science Information Partners resulting from the peer-review process of two Cooperative Agreement notices. The NRC has sought a rich range of expertise to be represented in the workshop, including earth scientists, political scientists, social scientists, organizational experts, information scientists, management and organization specialists. Other attendees will include senior NASA management, and representatives of industry, government and academia that have dealt with federation approaches.

NASA asked the NRC to conduct the workshop to explore possible approaches to establishing a "federated" structure for managing the EOSDIS. The NRC suggested that the

federation may be a means to empower new levels of achievement in Earth science research, applications, and data stewardship, and in a wide range of activities in both private and public sectors. The NRC agreed to conduct the workshop to educate current and potential future users and producers of EOSDIS data about federations, and to evaluate the strengths and weaknesses of different governance models for such an environmental information federation.

The workshop report, which the NRC will put through a "fast-track" publication process, will describe the governance scenarios considered and summarize the presentations and discussions. The report will not include policy or research recommendations.

The Federation Experiment

Both the NRC and NASA have acknowledged that there are indeed serious risks involved with this nascent federated approach, which would transfer major scientific functions outside the Government. As the Earth Science program office has stated, NASA has a continuing responsibility to ensure that EOSDIS is operated fairly and provides the highest levels of support to the diverse interests of the research community, while pursuing attractive ideas, such as this one, which might make EOSDIS more useful to and integrated with its users. NASA's OES has resolved to make peer-review and competition a more recurrent feature in all our projects, including our data centers' activities. It is useful to examine where the best level in an organization really is for salient types of decisions to be made. By their submission of proposals, these projects have expressed an interest in prototyping how a move to a federated environmental data system might occur. Since this experiment is organized through **working prototype** data centers, which are all mandated to make their services available on a non-discriminatory basis, it is an experiment in which NASA's user community can all participate.

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Selected Type 2 WP-ESIP Projects' Titles and Project Leaders

* "The Distributed Oceanographic Data System: A Framework for

Access to Scientific Data in the EOS Federation," led by Peter

Cornillon, University of Rhode Island, Narragansett.

* "The Earth System Science Workbench: A Scaleable Infrastructure

for ESIPs," led by James Frew, University of California, Santa

Barbara.

* "Seasonal to Interannual Earth Science Information Partner

(SIESIP)," led by Menas Kafatos, George Mason University, Fairfax,

VA.

* "Progressive Mining of Remotely Sensed Data for Environmental and Public Health Applications," led by Chung-Sheng Li, International Business Machines, Yorktown Heights, NY.

* "A Web-Based System for Terrestrial Environmental Research," led by Berrien Moore, University of New Hampshire, Durham.

* "ESP2Net: Earth Science Partners' Private Network," led by Richard Muntz, University of California, Los Angeles.

* "Evolution of Snow Pack in the Southwestern United States: Spatial and Temporal Variability from a Remotely Sensed and In Situ Data Set," led by James J. Simpson, Scripps Institute of Oceanography, University of California, San Diego.

* "Tropical Rainforest Information Center," led by David L. Skole, Michigan State University, East Lansing.

* "An On-Demand Data Processing and Delivery System for Climate Studies Using Passive Microwave Data Sets," led by Roy W. Spencer, Marshall Space Flight Center, Huntsville, AL.

* "A Landcover Earth Science Information Partnership," led by John R. G. Townshend, University of Maryland, College Park.

* "GPS Environmental & Earth Science Information System: GENESIS," led by Thomas P. Yunck, Jet Propulsion Laboratory, Pasadena, CA.

* "Improved Ocean Radar Altimeter and Scatterometer Data and Atmosphere-Ocean Model Simulation for Coastal and Global Change

Studies," led by Victor Zlotnicki, Jet Propulsion Laboratory, Pasadena, CA.

Selected Type 3 WP-ESIP Projects' Titles and Project Leaders

*"Institutionalizing MTPE Data for Land and Environmental Management," led by Thomas Burk, University of Minnesota, St. Paul.

*"California Land Science Information Partnership," led by Gary Darling, California Resources Agency, Sacramento.

*"Performing a Regional Assessment and Prototyping Internet Accessible MTPE Products for the Upper Rio Grande Basin," led by Stanley Morain, University of New Mexico, Albuquerque.

* "Integrating Environmental and Legal Information Systems," led by Konstantinos Kalpakis, University Space Research Association (USRA), Greenbelt, MD.

* "A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS Phase III Operations," led by George Seielstad, Upper Midwest Aerospace Consortium (UNAC), University of North Dakota, Grand Forks.

*"WeatheRoute," led by Kevin Meagher, Reading Information Technology, Inc., Reading, PA.

*"MTPE Education Series," led by Catherine Gautier, Planet Earth Science, Inc., Santa Barbara, CA.

*"Integration and Application of MTPE Data and Information to the San Francisco Bay Area and Monterey Bay Region," led by David Etter, Bay Area Shared Information Consortium (BASIC), Mountain

View, CA.

*"Museums Teaching Planet Earth," led by Patricia Reiff, Rice University, Houston, TX.

*"Terrain Intelligence Products from EOS Sensor Data," led by Douglas Kliman, MRJ Associates, Tucson, AZ.

*"NBC News and Information: Extending MTPE Data to the World," led by David Jones, WRC-TV4, Washington, DC.

*"MTPE-Derived Data Products for the Fisheries," led by Patrick Simpson, Scientific Fishery Systems, Inc., Anchorage, AK.