

**New Mexico
Experimental Program to Simulate Competitive Research
Program Year 1 Evaluation Report**

September 1, 2008 to August 1, 2009

**Prepared for:
NM EPSCoR State Office**



**Author:
Kirk F. Minnick**



**Minnick & Associates, Inc.
PO Box 820 Tijeras, New Mexico 87059
505-889-9358 Fax: 505-212-5842
Kminnick@EvalTeam.com**

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Introduction

NM EPSCoR RII3 is funded by the National Science Foundation (NSF) and is designed to fulfill the foundation's mandate to promote scientific progress nationwide. The EPSCoR program is directed at those jurisdictions that have historically received lesser amounts of NSF Research and Development (R&D) funding. Twenty-five states, the Commonwealth of Puerto Rico and the U. S. Virgin Islands currently participate. Through this program, NSF establishes partnerships with government, higher education and industry that are designed to effect lasting improvements in a state's or region's research infrastructure, R&D capacity and hence, its national R&D competitiveness.

This report will attempt to assess the progress of the project by linking the data reported with the project's Strategic Plan, which was developed in January, 2009. The metrics will focus around the following categories:

- People: Participant demographics of faculty, postdocs, undergrads, K-12, collaborators, institutions, and diversity of all the above;
- Material Infrastructure: Equipment purchased & installed, models developed and cyberinfrastructure acquired (number, type, use, results);
- Knowledge generation: presentations, publications, proposals and awards, products and patents
- Discovery Learning: data collected, observations and research (number, type, kind, availability)
- Knowledge generation: presentations, publications, proposals and awards, products and patents
- Outreach/Public Dissemination: Scientific literacy and outreach efforts, curriculum development, public outreach, public presentations, policy and policy makers impacted

Background

NM EPSCoR RII3 was funded in September, 2008 for a period of five years and for \$3million per year. The overarching goal for NM EPSCoR RII3 is to enhance research competitiveness through the acquisition of critical research infrastructure and cyberinfrastructure, and through strategic investment in human infrastructure. Secondly, the goal is to address a critical state problem of worldwide significance of the effects of climate change on water supply and sources in arid regions. Five specific research infrastructure improvement programs are designed to significantly benefit and enhance competitiveness of the NM academic research and education enterprise. These are:

- Major research infrastructure that fills critical infrastructure gaps in monitoring and analyzing climate and hydrological conditions in northern NM;
- Innovative in situ hydrological sensing infrastructure;
- Climate change infrastructure seed grant program;
- Multi-scale and multi-disciplinary model development; and
- Innovation working groups

A focus on improving the cyberinfrastructure (CI) to support these efforts is also included in NM EPSCoRs plans to stimulate innovative uses of CI including:

- Development of efficient data acquisition, processing, and storage models;
- High performance computing;
- Interoperable data discovery and delivery through interfaces based upon open standards;
- Deployment of collaboration tools that facilitate both synchronous and asynchronous knowledge exchange; and
- Development of a project portal that provides a single point of access for project products, services, and information.

Finally, NM EPSCoR RII3 proposes to enhance the human infrastructure in NMs academic and scientific research enterprise with three plans focused on education and outreach. These are:

Education Plan

- Summer Institute focusing on middle school teacher professional development in northern NM;
- Undergraduate Research Opportunities for students at NMs regional non-PhD granting institutions;
- Research Training Group Program that provides interdisciplinary training and develops modeling skills for MS/PhD students;
- Junior Faculty Leadership Training; and
- Informing faculty throughout NM about funding opportunities via NSF Days and other NSF outreach activities.

Outreach and Communication Plan

- Climate Change Exhibit (incorporating Science on a Sphere) to reach 230,000 annual visitors;
- Climate Change Seminar Series to bring nationally recognized experts to the large municipalities throughout the state;

- Science Cafs to communicate climate change science to citizens in rural northern NM;
- Town Hall meeting to provide a forum for scientists, business leaders, and concerned citizens to build consensus and develop practical, actionable solutions; and
- Climate Change Web Portal to provide easy access to news, project information, documents and publications, data and services.

Diversity Plan

- Place-based science education will reach out to community members and provide teachers with locally relevant science for their classrooms.
- Students with diverse backgrounds will be incorporated into all research opportunities through targeted recruitment.
- Faculty and staff will receive training on diversity inclusion in teaching and learning with a diverse student body.
- Diversity will be a theme of the program, addressed with workshops and through outside experts, and reflective study programs.
- Partner with other diversity programs in NM and nationally.

According to the strategic plan developed in October, 2008 and submitted to NSF in January, 2009:

*The overarching **vision** for the NM EPSCoR Program is to enable:*

“An environment in which New Mexico scientists and educators are fully competitive in climate change research and education.”

*NM EPSCoR RII3 is designed to enhance research competitiveness through investment in three strategic areas: (1) critical Research Infrastructure, (2) Cyberinfrastructure, and (3) Human Infrastructure. These investments will help establish NM as a laboratory for climate change research, and as a model for science-based public policy. The multi-disciplinary, multi-scale effort is envisioned to transform climate change science and policymaking in NM by providing the tools required for quantitative, science-driven discussion of difficult water policy options facing the State in the 21st Century. These goals are articulated in the NM EPSCoR **mission**:*

“Provide the critical gap infrastructure, computational support, and education and outreach opportunities to foster excellence in climate change research and education.”

The remainder of this report will examine the data reported for the Year 1 Annual Report and the status of the activities proposed. In this evaluation report and the companion reports on the 14 program areas, the term "component" will be used as opposed to the term "strategic objectives" in the strategic plan. Although the term "strategic objective" is not wrong, it could be confusing when used in an evaluation report where goals and objectives have very different meanings.

People (Human Infrastructure, Collaboration and Diversity)

Diversity and expanding the involvement of women and underrepresented minorities in the sciences is one of the objectives of NSF, EPSCoR and NM EPSCoR. New Mexico had a population of 1.8 million in the 2000 census; 46% White/Anglo, 42% Hispanic, 10% Native American, 2% African American and 1% Asian. NM is a minority majority state, with 54% being a member of a non-Caucasian ethnic group. This section will explore the degree of involvement of different groups of participants by level of participation, component, participant role and participating institutions. The role of collaborators and the nature of their collaborations with the project will also be presented.

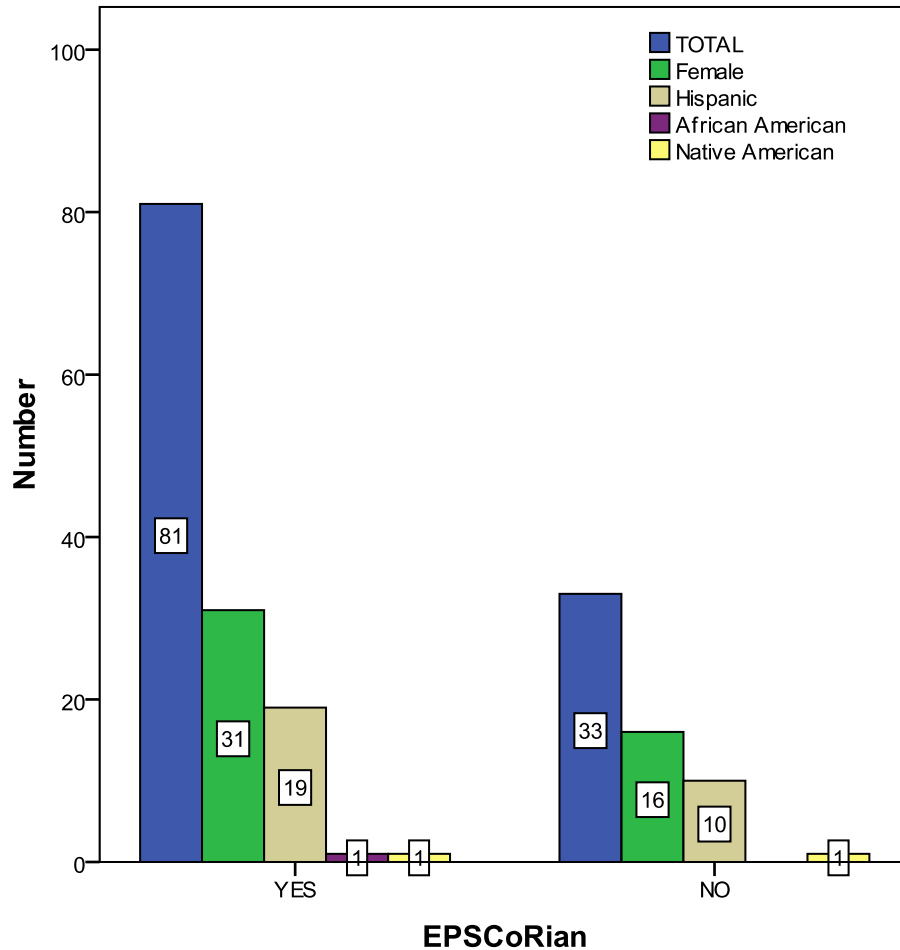
The definitions of participant and collaborator in this report differs slightly from that in the Annual Report submitted to NSF. In that report, participants were defined as those with 160 or more hours of involvement, while those with less than 160 hours were considered collaborators. In this report, participants are defined as those directly contributing to accomplishing the goals of EPSCoR either in one of the three research areas, human infrastructure or cyberinfrastructure, regardless of the number of hours involved. This would also include members of the advisory committee and project management personnel. These participants will be referred to as EPSCoRians. Another type of participant are those that have participated in EPSCoR programs; such as K-12 Teacher Professional Development and Junior Faculty Leadership Program. These participants have received services from the project, but were not direct contributors to accomplishing NM EPSCoR goals.

In this evaluation report, the FastLane definition of collaborators is used. These are scientists, engineers, educators and others who have had significant contacts with EPSCoRians to further the NM EPSCoR goals. Collaborations can be internal to NM EPSCoR where EPSCoRians from two institutions in the state are conducting research together or one can be external to EPSCoR, where an NM EPSCoRian is consulting with a non-EPSCoRian, either within or outside NM.

Participants by Type of Involvement

There were 114 individuals who participated in one or more project activities during the first program year. Figure 1 shows how many of these are female, Hispanic, African American, Native American for EPSCoRians (those directly contributing) and non-EPSCoRians (those receiving services).

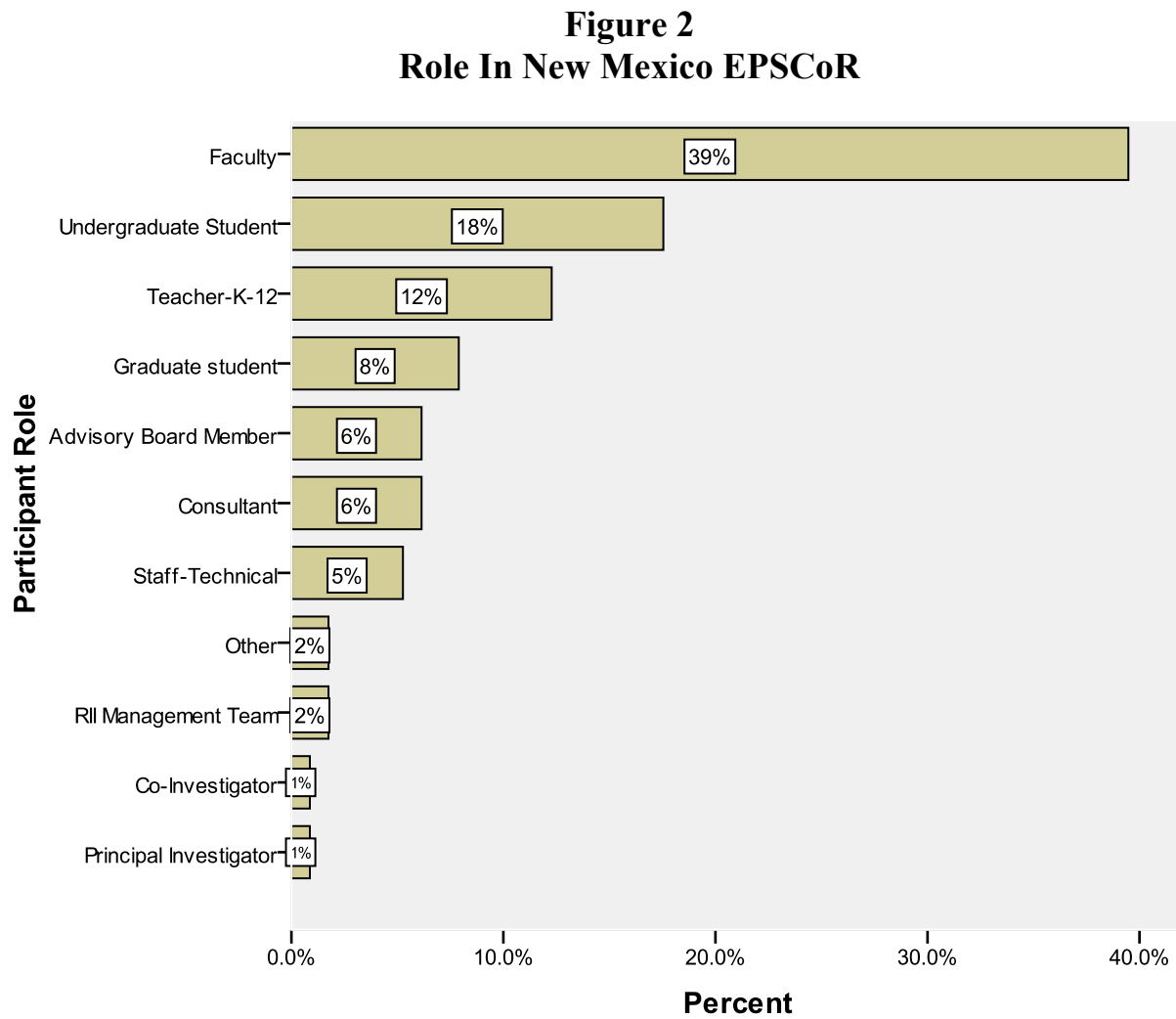
Figure 1
Number of Female, and Underrepresented Minority by
Type of EPSCoR Participant (n=114)



Eighty-one (71%) of all participants were EPSCoRians, directly contributing to the goals of NM EPSCoR during Year 1. Of these, 31 (38%) were female, 19 (23%) Hispanic, 1 (1%) African American and 1 (1%) Native American. Thirty-three (39%) of the participants were non-contributing participants, either K-12 teachers or junior faculty participating in workshops organized by EPSCoRians. Of these, 16 (48%) were female, 10 (30%) Hispanic and 1 (3%) Native American.

Participants by Role in EPSCoR

Figure 2 shows the percentage of participants in NM EPSCoR by role.



Faculty have the largest representation with almost 4 of 10 participants or 39%, followed by undergraduate students (18%), K-12 teachers (12%), and graduate students (8%).

Participants by Component

NM EPSCoR has 14 components ranging from Climate and Hydrological research to Public Outreach. Figure 3 shows the number of participants involved in NM EPSCoR by component for year 1.

Not all components are funded at this time. For instance, NSF Days is an objective in Year 3, and hence there are no participants at this time. The pie chart includes both EPSCoRians (those contributing to EPSCoR goals) and those receiving training and professional development. It does not include collaborators, which for some components are heavily relied upon.

Cyberinfrastructure is a good example of a NM EPSCoR objective where the number of participants is quite low with only 3 individuals. However, they have formed a task force of collaborators to help provide guidance and direction in their efforts. This may be a challenge as the level of effort continues to grow across the program years. About 40% of the year 1 participants were involved in one of the three research components: Climate and Hydrology (18%), Water Quality (14%), and Socioeconomics and Acequia (8%). Education and public outreach combined amount to almost half (47%) of the program participants: Junior Faculty Leadership training (17%), K-12 Professional teacher development (15%), Undergraduate Research Program (12%) and Public Outreach (3%) combined involved almost half (47%). Lastly, Program Review (6%) and Project management (5%) completed the areas that participants were involved in during year 1.

Each component is at a different stage of development at this time and therefore comparisons of participant demographics, including gender, ethnicity/race and role may be premature. However, it also may be helpful for component leaders to examine these data and set goals for the involvement of members of underrepresented groups as the project matures.

Figure 4 presents the demographic data of all 114 participants from program year 1 by component, institution and role in the project. These data do not include collaborators or others who may have been involved with the project but not reported as participants.

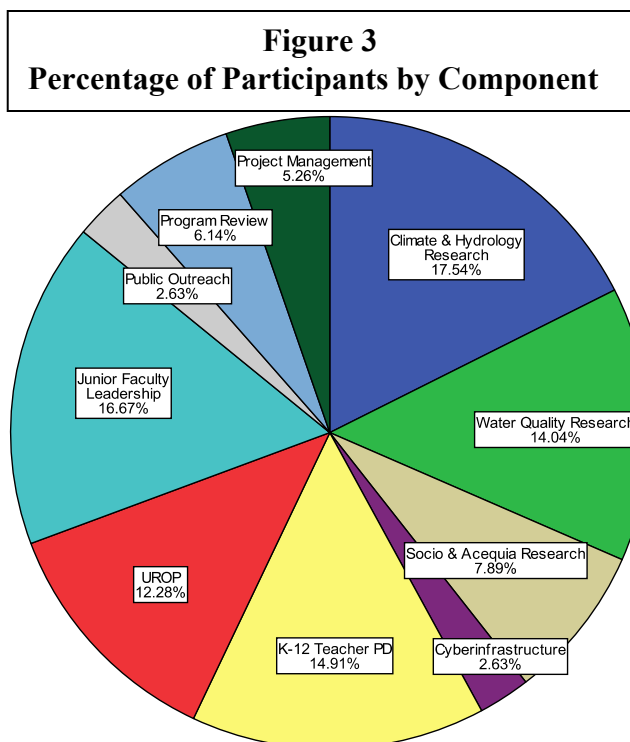


Figure 4
Year 1 Participant Demographics by Component, Campus and Role

Component	Organization	EPSCoR Role	TOTAL	Female	URM	African American	Hispanic	Native American	
1-Climate and Hydrology Research	New Mexico Institute of Mining and Technology	Faculty	1	0	0	0	0	0	
		Graduate student	1	0	1	0	1	0	
		Total	2	0	1	0	1	0	
	New Mexico State University	Faculty	5	2	1	1	0	0	
		Graduate student	1	0	0	0	0	0	
		Other	2	0	1	0	0	1	
		Undergraduate Student	7	1	4	0	4	0	
		Total	15	3	6	1	4	1	
	University of New Mexico	Faculty	1	0	0	0	0	0	
		Graduate student	1	1	0	0	0	0	
		Undergraduate Student	1	0	1	0	1	0	
		Total	3	1	1	0	1	0	
	Total	Faculty	7	2	1	1	0	0	
		Graduate student	3	1	1	0	1	0	
		Other	2	0	1	0	0	1	
		Undergraduate Student	8	1	5	0	5	0	
		Total	20	4	8	1	6	1	
	2-Water Quality Research	New Mexico Bureau of Geology and Mineral Resources	Faculty	1	0	0	0	0	0
			Total	1	0	0	0	0	0
		New Mexico Highlands University	Faculty	1	0	1	0	1	0
Graduate student			2	1	1	0	1	0	
Undergraduate Student			1	1	1	0	1	0	
Total			4	2	3	0	3	0	
New Mexico Institute of Mining and Technology		Faculty	4	0	0	0	0	0	
		Total	4	0	0	0	0	0	
University of New Mexico		Faculty	3	1	0	0	0	0	
		Graduate student	2	1	0	0	0	0	
		Staff-Technical	1	0	0	0	0	0	
		Undergraduate Student	1	1	0	0	0	0	
		Total	7	3	0	0	0	0	
Total		Faculty	9	1	1	0	1	0	
		Graduate student	4	2	1	0	1	0	
	Staff-Technical	1	0	0	0	0	0		

Component	Organization	EPSCoR Role	TOTAL	Female	URM	African American	Hispanic	Native American
		Undergraduate Student	2	2	1	0	1	0
		Total	16	5	3	0	3	0
3-Socio-economics and Acequia Research	New Mexico Acequia Association	Staff-Technical	1	1	1	0	1	0
		Total	1	1	1	0	1	0
	New Mexico State University	Faculty	4	0	0	0	0	0
		Staff-Technical	1	0	1	0	1	0
		Total	5	0	1	0	1	0
	Sandia National Lab	Faculty	1	0	0	0	0	0
		Total	1	0	0	0	0	0
	University of New Mexico	Faculty	2	1	1	0	1	0
		Total	2	1	1	0	1	0
	Total	Faculty	7	1	1	0	1	0
		Staff-Technical	2	1	2	0	2	0
		Total	9	2	3	0	3	0
7-Cyber-infrastructure	University of New Mexico	Consultant	1	0	0	0	0	0
		RII Management Team	1	0	0	0	0	0
		Staff-Technical	1	0	1	0	1	0
		Total	3	0	1	0	1	0
	Total	Consultant	1	0	0	0	0	0
		RII Management Team	1	0	0	0	0	0
		Staff-Technical	1	0	1	0	1	0
		Total	3	0	1	0	1	0
9-K-12 Professional Teacher Development	Northern NM High Schools	Consultant	3	2	1	0	1	0
		Teacher-K-12	14	10	9	0	8	1
		Total	17	12	10	0	9	1
	Total	Consultant	3	2	1	0	1	0
		Teacher-K-12	14	10	9	0	8	1
		Total	17	12	10	0	9	1
10-Undergraduate Research Opportunity Program	Eastern New Mexico University	Undergraduate Student	2	1	0	0	0	0
		Total	2	1	0	0	0	0
	New Mexico Highlands University	Undergraduate Student	3	2	3	0	3	0
		Total	3	2	3	0	3	0
	New Mexico Institute of Mining and Technology	Faculty	2	0	1	0	1	0
		Staff-Technical	1	1	0	0	0	0
		Total	3	1	1	0	1	0
	Northern NM College	Undergraduate Student	1	1	1	0	1	0
		Total	1	1	1	0	1	0

Component	Organization	EPSCoR Role	TOTAL	Female	URM	African American	Hispanic	Native American
	San Juan College	Undergraduate Student	4	2	0	0	0	0
		Total	4	2	0	0	0	0
	University of New Mexico	Faculty	1	1	0	0	0	0
		Total	1	1	0	0	0	0
	Total	Faculty	3	1	1	0	1	0
		Staff-Technical	1	1	0	0	0	0
		Undergraduate Student	10	6	4	0	4	0
Total		14	8	5	0	5	0	
13-Junior Faculty Leadership Training	Eastern New Mexico University	Faculty	3	1	0	0	0	0
		Total	3	1	0	0	0	0
	New Mexico Institute of Mining and Technology	Faculty	7	1	2	0	2	0
		Total	7	1	2	0	2	0
	New Mexico State University	Faculty	3	1	0	0	0	0
		Total	3	1	0	0	0	0
	Northern NM College	Faculty	5	2	0	0	0	0
		Total	5	2	0	0	0	0
	University of New Mexico	Faculty	1	1	0	0	0	0
		Total	1	1	0	0	0	0
Total	Faculty	19	6	2	0	2	0	
	Total	19	6	2	0	2	0	
14-Public Outreach and Communication	New Mexico Museum of Natural History & Science	Consultant	1	1	0	0	0	0
		RII Management Team	1	1	0	0	0	0
		Total	2	2	0	0	0	0
	University of New Mexico	Consultant	1	0	0	0	0	0
		Total	1	0	0	0	0	0
	Total	Consultant	2	1	0	0	0	0
RII Management Team		1	1	0	0	0	0	
Total		3	2	0	0	0	0	
15-Program Review	New Mexico EPSCoR	Advisory Board Member	7	4	0	0	0	0
		Total	7	4	0	0	0	0
	Total	Advisory Board Member	7	4	0	0	0	0
		Total	7	4	0	0	0	0
16-Project Management	New Mexico EPSCoR	Co-Investigator	1	1	0	0	0	0
		Consultant	1	0	0	0	0	0
		Graduate student	2	2	0	0	0	0
		Principal Investigator	1	0	0	0	0	0
		Staff-Technical	1	1	0	0	0	0

Component	Organization	EPSCoR Role	TOTAL	Female	URM	African American	Hispanic	Native American
	Total	Total	6	4	0	0	0	0
		Co-Investigator	1	1	0	0	0	0
		Consultant	1	0	0	0	0	0
		Graduate student	2	2	0	0	0	0
		Principal Investigator	1	0	0	0	0	0
		Staff-Technical	1	1	0	0	0	0
		Total	6	4	0	0	0	0
All Components	Eastern New Mexico University	Faculty	3	1	0	0	0	0
		Undergraduate Student	2	1	0	0	0	0
		Total	5	2	0	0	0	0
	New Mexico Acequia Association	Staff-Technical	1	1	1	0	1	0
		Total	1	1	1	0	1	0
	New Mexico Bureau of Geology and Mineral Resources	Faculty	1	0	0	0	0	0
		Total	1	0	0	0	0	0
	New Mexico EPSCoR	Advisory Board Member	7	4	0	0	0	0
		Co-Investigator	1	1	0	0	0	0
		Consultant	1	0	0	0	0	0
		Graduate student	2	2	0	0	0	0
		Principal Investigator	1	0	0	0	0	0
		Staff-Technical	1	1	0	0	0	0
		Total	13	8	0	0	0	0
	New Mexico Highlands University	Faculty	1	0	1	0	1	0
		Graduate student	2	1	1	0	1	0
		Undergraduate Student	4	3	4	0	4	0
		Total	7	4	6	0	6	0
	New Mexico Institute of Mining and Technology	Faculty	14	1	3	0	3	0
		Graduate student	1	0	1	0	1	0
		Staff-Technical	1	1	0	0	0	0
		Total	16	2	4	0	4	0
	New Mexico Museum of Natural History & Science	Consultant	1	1	0	0	0	0
RII Management Team		1	1	0	0	0	0	
Total		2	2	0	0	0	0	
New Mexico State University	Faculty	12	3	1	1	0	0	
	Graduate student	1	0	0	0	0	0	
	Other	2	0	1	0	0	1	
	Staff-Technical	1	0	1	0	1	0	
	Undergraduate Student	7	1	4	0	4	0	

Component	Organization	EPSCoR Role	TOTAL	Female	URM	African American	Hispanic	Native American
		Total	23	4	7	1	5	1
	Northern NM College	Faculty	5	2	0	0	0	0
		Undergraduate Student	1	1	1	0	1	0
		Total	6	3	1	0	1	0
	Northern NM High Schools	Consultant	3	2	1	0	1	0
		Teacher-K-12	14	10	9	0	8	1
		Total	17	12	10	0	9	1
	San Juan College	Undergraduate Student	4	2	0	0	0	0
		Total	4	2	0	0	0	0
	Sandia National Lab	Faculty	1	0	0	0	0	0
		Total	1	0	0	0	0	0
	University of New Mexico	Consultant	2	0	0	0	0	0
		Faculty	8	4	1	0	1	0
		Graduate student	3	2	0	0	0	0
		RII Management Team	1	0	0	0	0	0
		Staff-Technical	2	0	1	0	1	0
		Undergraduate Student	2	1	1	0	1	0
		Total	18	7	3	0	3	0
	Total	Advisory Board Member	7	4	0	0	0	0
		Co-Investigator	1	1	0	0	0	0
		Consultant	7	3	1	0	1	0
		Faculty	45	11	6	1	5	0
		Graduate student	9	5	2	0	2	0
Other		2	0	1	0	0	1	
Principal Investigator		1	0	0	0	0	0	
RII Management Team		2	1	0	0	0	0	
Staff-Technical		6	3	3	0	3	0	
Teacher-K-12		14	10	9	0	8	1	
Undergraduate Student		20	9	10	0	10	0	
Total		114	47	32	1	29	2	

Involving participants in NM EPSCoR from diverse backgrounds is an important goal for EPSCoR, both from a programmatic perspective of creating a more diverse workforce and for strengthening the research by including investigators with different life experiences who can observe and interpret data from different perspectives. The goal of NM EPSCoR is a 50% involvement in all its components of female and underrepresented minorities.

The project wide results from the table above show that slightly less than half (41%) of the participants are female, and about a fourth (28%) are members of underrepresented minorities (African American: 1%; Hispanic: 25%; and Native American: 2%). This is a good start, as many of the components have not been fully implemented and researchers need specialize training and education to become productive members of the project.

However, when disaggregating the data by role in EPSCoR and component there are strengths and weaknesses in the current levels of diversity. In the largest role of participants, only about a fourth (24%) of faculty are female, and only 13% are from an underrepresented minority. The diversity of undergraduate participants involved in EPSCoR, however, were quite high where almost half of the females (45%) and underrepresented minorities (50%) participated. Still there were no African American or Native American undergraduates. Participants in the role of K-12 teachers had the highest percentage of females (71%) and underrepresented minorities (64%) of all the participant roles. As a group, over half (56%) of the graduate students are female, while only 22% are from an underrepresented minority.

Geographic and institutional diversity is also an important goal of NM EPSCoR. The project involved participants from 7 institutions of higher education, including PhD and non-PhD granting institutions. These included participants from the following: ENMU (5), NMHU (7), NM Tech (16), NMSU (23), NNMC (6), SJC (4) and UNM (18). In addition the project involved participants from the NM Acequia Association (1), NMMNHS (2), NM Bureau of Geology(1), K-12 high schools (17) and Sandia National Labs (1).

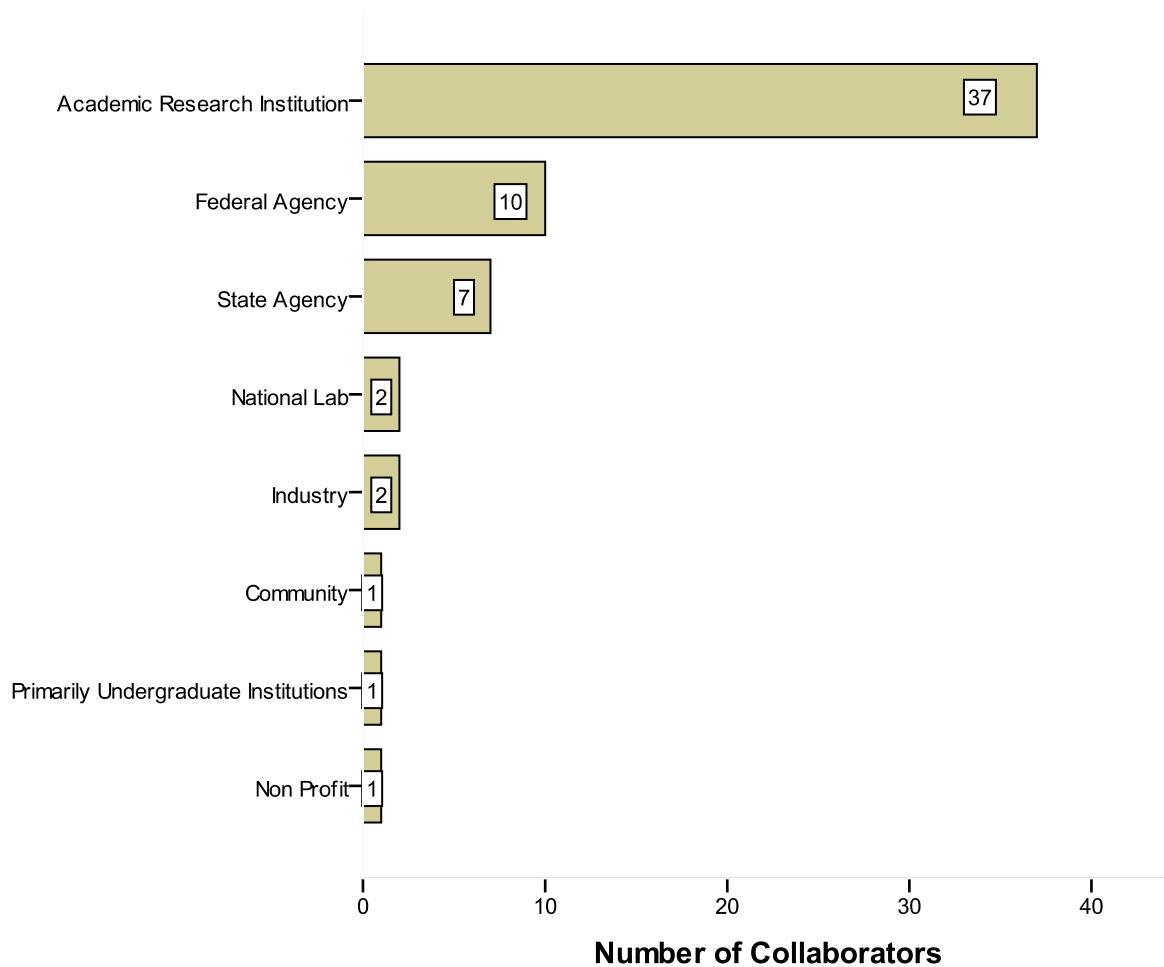
The significant involvement of 7 institutions of higher education is commendable, especially noting the numbers of participants at each. One academic institution that appears missing is WNMU in Silver City. Also, there were no participants from for-profit, state or federally funded agencies. Individuals from these types of institutions may be involved as collaborators in the project, but it may be important to have them involved as participants as the project moves forward.

Geographically, the participants come from across the entire state. There may be a slight bias towards northern NM, which is understandable given that the snow pack under investigation is in the north. However, as this El Nino year has shown, even the Gila in southwest NM can be the recipient of a significant snow pack, which can impact the research.

Collaborators

Recognizing that for NM EPSCoR to be successful in improving its research accomplishments it must maximize the collaboration between its researchers both within and outside the state. Figure 5 presents the number of collaborators across NM EPSCoR components by the collaborator's institution type.

Figure 5
Number of Collaborators by Type of Institution
(Total collaborators=61)



As expected, over half (61%) of the collaborations were with faculty at academic research institutions, although 16% were with individuals working at a Federal agency and another 11% who were working at a state agency. This shows that EPSCoR is involving employees from both Federal and state government in their work, not as participants but as collaborators. There were only 2 (3%) of the collaborators who were associated with industry or a for-profit company. The state of New Mexico has historically suffered from a lack of for-profit business enterprises, especially in the area of basic research.

Figure 6 presents the collaborators that have been involved with NM EPSCoR researchers and components, along with a short description of the nature of the collaboration that occurred. Those collaborations that are between NM EPSCoRians within New Mexico have been highlighted with shading.

Figure 6
Collaborators in Year 1 by Component, Campus and Researchers

Component	#	Campus	EPSCoR Researcher	Collaborator Organization	Collaborator	Description of Collaboration
1-Climate and Hydrology Research	1	NMSU	Bleweiss	Consultant	Kite, Geoff	Developer of the SLURP Model.
	2	NMSU	Bleweiss	NMSU-Physical Science Laboratory	Stein, William	Assisting in the SLURP Model development
	3	NMSU	Rango	Consultant	Martinec, Jaroslav	Developer of the SRM Model
	4	NMSU	Rango	USDA-NRCS	Schiffée, Kenneth	Assisting in the set up of SCAN and SNOTEL Sites
	5	NMSU	Rango	USDA-NRCS	Sleep, Wayne	Assisting in the set up of SCAN and SNOTEL Sites
	6	NMSU	Rango/DeMouche	Elephant Butte Irrigation District	Esslinger, Gary	Assisting in the maintenance of the EBID Weather Stations
	7	NMSU	Rango/DeMouche	University of Arizona	Garfin, Greg	Assisting in the set up of Navajo Nation Weather Stations
	8	NMSU	Rango/DeMouche	Middle Rio Grande Conservancy District	Gensler, David	Assisting in the set up of Weather stations
	9	NMSU	Rango/DeMouche	USDA-NRCS	Gillespie, Mike	Snow Survey Supervisor - Assisting in the set up of SNOTEL sites
	10	NMSU	Rango/DeMouche	Navajo Nation	Leeper, John	Assisting in the set up of Navajo Nation Weather Stations
	11	NMSU	Rango/DeMouche	U.S. Fish & Wildlife Service - Southwestern Region	Maxwell, Chuck	Assisting in the set up of RAWs upgrades
	12	NMSU	Rango/DeMouche	USDA-NRCS	Schaefer, Garry	Assisting in the set up of SCAN sites
	13	NMSU	Rango/DeMouche	USDA-NRCS	Tolsdorf, Tony	Assisting in the set up of SCAN sites
	14	NMSU	Steele	University of Notham, UK	Hann, David	Assisting in the Imaging Analysis of canopy cover.
	15	NMSU	Steele	National School of Surveying, University of Otago	Sirguyey, Pascal	Assisting in the Imaging Analysis of canopy cover.
	16	NMSU	Steele	University of Idaho	Smith, Alistair	Assisting in the Imaging Analysis of canopy cover.
	17	NMT	Wilson	University of Arizona	Brooks, Paul	Snow hydrology and stream chemistry in the Valles Caldera
	18	NMT	Wilson	University of Texas, Austin	Cardenas, Bayani	Field investigations (Valles Caldera), laboratory flume studies, and mathematical modeling of stream hyporheic zones.
	19	NMT	Wilson	University of Arizona	Troch, Peter	Stream hydrology and chemistry in the Valles Caldera
	20	UNM	Galewsky	LANL	Ringler, Todd	Climate modeling research, workshop on climate model downscaling, graduate student training
2-Water Quality Research	1	NMHU	Martinez	University of New Mexico	Dahm, Cliff	Will be working on determining concentrations of various nutrients in the Upper East Fork stream, Valles Caldera Preserve
	2	NMHU	Martinez	Valles Caldera National Preserve	Parmenter, Bob	Impact of cattle on water quality of the East Fork Stream, Valles Caldera

Component	#	Campus	EPSCoR Researcher	Collaborator Organization	Collaborator	Description of Collaboration
	3	NMHU	Martinez	New Mexico Institute of Mining & Technology	Pullin, Mike	Impact of cattle on water quality of the East Fork Stream, Valles Caldera
	4	NMHU	Martinez	University of New Mexico	Van Horn, David	Concentrations of total and dissolved organic carbon post cattle impact to the East Fork Stream, Valles Caldera
3- Socioeconomics and Acequia Research	1	NMSU	Fernald	New Mexico State University	Archuleta, David	Local help and contact establishment in the study sites
	2	NMSU	Fernald	New Mexico State University	Boykin, Ken	Technical advice and collaborator in additional proposals submitted
	3	NMSU	Fernald	New Mexico State University	Cowley, David	Technical advice and collaborator in additional proposals submitted
	4	NMSU	Fernald	Taos-Rio Hondo community	Martinez, Palemon	Community contact in the Rio Hondo site
	5	NMSU	Fernald	Taos-County Agent	Torres, Pat	Local contact in Taos, NM
	6	NMSU	Fernald	NRCS-Taos	Vigil, Peter	Provided mapping of water levels in the Rio Hondo site
	7	UNM	Chermak	Climate Leadership Initiative, Institute for a Sustainable Environment	Dopplet, Robert	Climate Economics Program Steering Committee
7- Cyberinfrastructure	1	UNM	Benedict	Idaho State University	Ames, Daniel	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 2
	2	UNM	Benedict	Idaho NSF EPSCoR	Bohach, Greg	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 3
	3	UNM	Benedict	University of New Mexico	Dahm, Cliff	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 4
	4	UNM	Benedict	University of Nevada, Reno	Dascalu, Segui	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 5
	5	UNM	Benedict	New Mexico State University	DeMouche, Leeann	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 6
	6	UNM	Benedict	University of New Mexico	Gawalsky, Joe	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 7
	7	UNM	Benedict	University of Idaho	Gessler, Paul	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 8
	8	UNM	Benedict	Idaho State University	Glenn, Nancy	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 9

Component	#	Campus	EPSCoR Researcher	Collaborator Organization	Collaborator	Description of Collaboration
	9	UNM	Benedict	University of Idaho	Godfrey, Bruce	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 10
	10	UNM	Benedict	University of Nevada, Reno	Harris, Fred	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 11
	11	UNM	Benedict	Desert Research Institute	Lancaster, Nick	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 12
	12	UNM	Benedict	New Mexico NSF EPSCoR	Mitchell, Katherine	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 13
	13	UNM	Benedict	Idaho National Laboratory	O'Leary, Patrick	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 15
	14	UNM	Benedict	University of Nevada, Reno	Okamoto, Sohei	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 14
	15	UNM	Benedict	Boise State University	Pierce, Jennifer	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 16
	16	UNM	Benedict	Idaho NSF EPSCoR	Schumaker, Rick	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 17
	17	UNM	Benedict	University of Idaho	Smith, Alistar	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 18
	18	UNM	Benedict	Boise State University	Sridhar, Venkat	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 19
	19	UNM	Benedict	New Mexico Institute of Mining & Technology	Wilson, John	Tri-state cyberinfrastructure coordination meeting in conjunction with the tri-state meeting held in Boise, ID, March 29-April 20
10- Undergraduate Research Opportunity Program	1	NMT	Pullin	University of New Mexico	Benedict, Karl	UROP faculty mentor
	2	NMT	Pullin	New Mexico State University	DeMouche, Leeann	UROP faculty mentor
	3	NMT	Pullin	New Mexico State University	Fernald, Sam	UROP faculty mentor
	4	NMT	Pullin	New Mexico Institute of Mining and Technology	Majkowski, Lisa	NMT REU: Interdisciplinary Science for the Environment
	5	NMT	Pullin	New Mexico Highlands University	Martinez, Edward	UROP faculty mentor

Component	#	Campus	EPSCoR Researcher	Collaborator Organization	Collaborator	Description of Collaboration
	6	NMT	Pullin	Valles Caldera National Preserve	Parmenter, Bob	UROP faculty mentor
	7	NMT	Pullin	New Mexico State University	Rango, Al	UROP faculty mentor
	8	NMT	Pullin	University of New Mexico	Sanchez-Silva, Renzo	UROP faculty mentor
	9	NMT	Pullin	New Mexico Institute of Mining and Technology	Wilson, John	UROP faculty mentor
14-Public Outreach and Communication	1	NMMNHS	Sapunar-Jursich	NSF & Association of Science and Technology Centers	Jones, Monica	The New Mexico Museum of Natural History & Science received a sub-award from the Association of Science and Technology Centers for their Communicating Climate Change grant. This grant has provided "se

Examples of some of the collaborations that have taken place in Program Year 1 include: assistance with set up of SCAN sites; RAWs upgrades; working with model developers; field investigations in the Valles Caldera; receiving technical advice and collaborating on proposals; community contacts; tri-state cyberinfrastructure coordination; faculty mentors for undergraduate in research program; and collaborating on how to communicate climate change to the public. Collaborations are occurring both within the state and between NM researchers and those in other states. The tri-state consortium (IA, NM, NV) is helping to facilitate some of the collaborations, although most of these collaborators are involved in the cyberinfrastructure group. However, as the research progresses it is likely that more of the research scientists will also establish collaborations to test their models and verify their findings, as well as determine the most appropriate manner to commonly share their data.

Material Infrastructure (Equipment, Measuring Stations, Models and Cyberinfrastructure)

As the name implies, the Research Infrastructure Improvement (RII) funding is meant to provide jurisdictions with the resources to enhance their research capabilities by purchasing equipment and funding infrastructure necessary for world class research. Figure 7 presents a table of infrastructure purchased during year 1 by component and institution.

**Figure 7
Infrastructure Acquired during Program Year 1**

Component	Campus/ Partner	#	Equipment Location	Equipment name	Total Purchase Amount	NSF EPSCoR \$	
1-Climate and Hydrology Research	NMSU	1	NMSU Main Campus	1-Field Laptop	\$7,500.00	\$7,500.00	
		2	South Valley, Albuquerque, NM	3-Weather Stations/ Installation to take place Summer, 2009 in the MRGCD South Valley Area	\$15,000.00	\$15,000.00	
		3	Taos Powderhorn manual snow course at or near San Antonio; Tentative location pending field inspecti	3-USDA/NRCS SNOTEL Sites; 6 Enhanced SNOTEL Sites	\$120,000.00	\$120,000.00	
		4	Tentative location pending field inspection: USDA - ARS Jornada Experiment Range, NMSU AES Alcalde	4-USDA/NRCS Soil Climate Analysis Network (SCAN) Sites (http://www.wcc.nrcs.usda.gov/sca/)	\$76,000.00	\$76,000.00	
					\$218,500.00	\$218,500.00	
	NMT	1	New Mexico Tech, Dept. of Earth & Environmental Science, Stable Isotope Laboratory	Picarro Laser Spectroscopy Water Isotope Analyzer	\$73,625.00	\$54,000.00	
					\$73,625.00	\$54,000.00	
	All				\$292,125.00	\$272,500.00	
	2-Water Quality Research	NMHU	1	Rm 155 Hilton Science Building, New Mexico Highlands University	Graphite Furnace Atomic Absorption Spectrophotometer	\$65,921.00	\$65,921.00
			2	Rm 155 Hilton Science Building, New Mexico Highlands University	Ion Chromatograph System	\$27,735.72	\$27,735.72
3			Rm 155 Hilton Science Building, New Mexico Highlands University	Total Organic Carbon Analyzer	\$31,205.00	\$31,205.00	
					\$124,861.72	\$124,861.72	
UNM		1	not installed during the reporting period	Aqua Sentinel Analyzer System from EnviroTech Instruments	\$21,890.00	\$0.00	
		2	not installed during the reporting period	Yellow Springs Instruments 6920-V2 Sonde	\$7,999.00	\$0.00	
					\$29,889.00	\$0.00	
All					\$154,750.72	\$124,861.72	

Component	Campus/ Partner	#	Equipment Location	Equipment name	Total Purchase Amount	NSF EPSCoR \$
3-Socio- economics and Acequia Research	NMSU	1	Four acequias (Inflow-Outflow locations) in the Rio Hondo site and Two acequias (Inflow-Outflow) in	Supplies for installing 12 Stream Flow stations/ Installation to take place Summer/Fall 2009	\$8,400.00	\$8,400.00
		2	Four acequias in the Rio Hondo study site (inflow)	4-Stream Flow Stations/ Installation to take place Summer-Fall, 2009 in the Rio Hondo study site	\$6,642.00	\$6,642.00
		3	Four acequias in the Rio Hondo study site (outflow)	4-Stream Flow Stations/ Installation to take place Fall, 2009 in the Rio Hondo study site	\$6,642.00	\$6,642.00
		4	NMSU Main Campus	2-Field Laptops	\$7,500.00	\$7,500.00
		5	NMSU Main Campus	Detailed imagery for the Rio Hondo and Rio Truchas study sites	\$10,000.00	\$10,000.00
		6	Tentative location pending field inspection in the Rio Brazos study site.	1-Weather Station with radio comm/ Installation to take place Summer, 2009 in the Rio de Brazos stud	\$4,965.76	\$4,965.76
		7	Tentative location pending field inspection in the Rio Brazos study site.	2-Soil moisture Station/ Installation to take place Fall, 2009 in the Rio de Brazos study site	\$6,136.00	\$6,136.00
		8	Tentative location pending field inspection in the Rio Hondo study site.	1-Weather Station with radio comm/ Installation to take place Summer, 2009 in the Rio Hondo study si	\$4,965.75	\$4,965.75
		9	Tentative location pending field inspection in the Rio Hondo study site.	2-Soil moisture Station/ Installation to take place Summer-Fall, 2009 in the Rio Hondo study site	\$6,136.00	\$6,136.00
		10	Two acequias in the Rio Brazos study site (inflow-outflow)	4-Stream Flow Stations/ Installation to take place Fall, 2009 in the Rio de Brazos study site	\$6,642.00	\$6,642.00
		11	Two locations in the Rio Hondo site and two locations in the Rio Brazos site	Supplies for installing 4 soil moisture stations/ Installation to take place Summer/Fall 2009	\$800.00	\$800.00
				\$68,829.51	\$68,829.51	
All				\$68,829.51	\$68,829.51	
14-Public Outreach and Communi- cation	NMMNHS	1	New Mexico Museum of Natural History & Science	2 Netbook Computers	\$1,000.00	\$1,000.00
		2	New Mexico Museum of Natural History & Science	Desktop Computer	\$1,000.00	\$1,000.00
					\$2,000.00	\$2,000.00
	All				\$2,000.00	\$2,000.00
Total	TOTALS				\$517,705.23	\$468,191.23

Almost, half a million dollars, \$468,191, was used from EPSCoR funds to purchase equipment and other infrastructure needed by NM EPSCoR researcher. More than half (58%) was used for purchasing instrumentation by the Climate and Hydrological research component. The instrumentation acquired by

this group was for equipment to establish and/or upgrade 9 SNOTEL sites (\$120,000); 4 USDA/NCRS SCAN sites (\$76,000), a Picarro Laser Spectroscopy Water Isotope analyzer (\$73,625) and the remaining \$22,500 for weather stations and a field laptop.

The Water Quality Research area had the second highest level of purchases with about a fourth (27%) of the expended funds for infrastructure. Most of these purchases were for instrumentation at NMHU: Graphite Furnace Atomic Absorption Spectrophotometer (\$65,921); Total Organic Carbon Analyzer (\$31,205) and a Ion Chromatograph System (\$27,735). An Aqua Sentinel Analyzer System (\$21,890) and Yellow Springs Instruments (\$7,999) were purchased for installation at UNM, but no NSF EPSCoR funds were used.

The Socioeconomics and Acequia research group expended \$68,829 or 15% of the infrastructure funds. The funding was used for equipment and supplies for installing 12 Stream flow stations (\$28,3264); 4 soil moisture stations (\$13,9072); 2 weather stations (\$9,931); imagery of the Rio Honda and Rio Truchas (\$10,000) and 2 field laptops (\$7,500).

Discovery Learning (Observing, Data Collecting, Research, Funding Sought)

Data collected, observations or field work, research conducted and proposals submitted and awarded provide an indicator of the outputs obtained through the work of the NM EPSCoR researchers. The project had a late start because of the funding cycle and the need to develop a strategic plan and purchase the equipment needed to observe, collect data and conduct research. However, researchers did submit proposals to acquire additional funding to leverage the NSF EPSCoR funding. Figure 8 lists the proposals submitted by component and campus and whether the proposal has been funded at this time.

Figure 8
Proposals Submitted/Awarded

Component	#	Campus	Proposal Status	Funding Agency	Title	PI	CoPIS	Amount
1-Climate and Hydrology Research	1	NMSU	Accepted	USDA-NRI	Small and Medium Size Farm Prosperity	Skaggs, Rhonda	DeMouche, Bleiweiss, Samani, Bawazir	\$375,000
2-Water Quality Research	1	NMHU	Pending Official Award	USDA-CSREES	Focusing Recruitment, Retention and Research Experiences On Increasing Underrepresented Minorities I	Martinez, Edward	Jennifer Lindline	\$299,000
	2	NMHU	Submitted	NSF-GK-12	Research and Education in Conservation and Ecological Restoration in Northeastern New Mexico	Martinez, Edward		\$600,000
	3	UNM	Declined	NSF	"Collaborative Proposal: Track 2: Planning for seven generations: climate change in Indian Country"	Laura, Crossey	Roberto Gonzalez-Plaza	\$331,962
	4	UNM	Declined	NSF	New, GK-12: ENvironmental CHAnge for New Mexico Teaching (ENCHANT)	Laura, Crossey	Scott Collins, Richard Kitchen	\$2,975,222
			All Campuses					\$4,206,184
3-Socioeconomics and Acequia Research	1	NMSU	Submitted	USDA-AFRI	Hydrologic and Socio-Economic Strategies to Enhance Water Savings in Western US irrigated River Vall	Fernald, Alexander	Guldan, Rivera, Hurd, Tidwell, Fleming	\$398,000
6-Critical Infrastructure Gap Seed Awards	1	NMHU	Accepted	NSF-MRI	The Acquisition of a FS3100 Chemistry Auto Analyzer	Martinez, Edward		\$82,000
16-Project Management	1	UNM	Accepted	NSF	Cyberinfrastructure Development for the Western Consortium of Idaho, Nevada, and New Mexico	Michener, William	Mitchell	\$2,000,000
All Components		All Campuses						\$7,061,184

Proposals totaling \$7.0 million were submitted during the first program year. Two proposals represent almost two-thirds (65%) of the total funds sought by NM EPSCoR researchers. One of these, the RII-2 for Cyberinfrastructure, was submitted by Project Management and was awarded \$2 million. The other

submitted by a researcher in the Water Quality group for a GK-12 was for \$2.9 million and was not awarded.

The Water Quality researchers submitted four proposals, all of which were focused on education/outreach and designed to expand the recruitment, retention and research experiences of underrepresented minorities. Two were declined, one accepted awaiting final award and the fourth was still being reviewed. The USDA-CSREES awarded \$299,000 for an EPSCoR proposal to focus recruitment, retention and research experiences on increasing underrepresented minority involvement.

The Climate and Hydrology researchers submitted one proposal which was accepted. It was funded by USDA-NRI for \$375,000 to examine Small and Medium Size Farm Prosperity.

The Socioeconomics and Acequia group submitted one proposal for \$398,000 to USDA-AFRI to explore Hydrologic and Socio-Economic Water Savings in Western US Irrigated River Valleys.

The Critical Infrastructure Gap Seed group was awarded \$82,000 by NSF-MRI to purchase a FS3100 Chemistry Auto Analyzer for NMHU.

Knowledge Generation (Professional Presentations, Publications, Patents)

Professional presentations, posters and invited talks are critical to increasing the visibility and reputations of NM climate change researchers, in addition to disseminating their valuable research findings to their colleagues. Figure 9 lists the presentations by EPSCoR researchers from the first program year.

Figure 9
Professional Presentations, Posters and Invited Talks

Component	#	Presentation Type	Author	Name of Event	Title of Presentation	Audience Type	Audience Size	Audience Scope
1-Climate and Hydrology Research	1	Poster	Bleiweiss, Max	American Geophysical Union Fal	Assimilation of AATSR, MERIS, and MODIS Data in th	Researchers	More than 100	International
	2	Invited Talk	Wilson, John	EPSCoR Western Tri-State Conso	New Mexico Observational Networks	Researchers	26-50	Multi-state
	3	Invited Talk	Wilson, John	Seminar, Department of Civil a	Residence time distributions in dynamic hydrologic	Researchers	51-100	International
3-Socioeconomics and Acequia Research	1	Research	Fernald, Alexander	USDA CSREES National Water Con	Modulation of river flow by irrigation system sur	Researchers	More than 100	National
	2	Education	Fernald, Alexander	Tri-State EPSCoR meeting	Researchers	Researchers	51-100	Regional
7-Cyberinfrastructure	1	Technical Overview	Benedict, Karl	EPSCoR Tri-state Meeting	Geospatial Interoperability Standards	Cyberinfrastructure planning w	20	Multi-state
	2	Technical Overview	Benedict, Karl	EPSCoR Tri-state Meeting	Service Interfaces for Machine-to-Machine Communic	Cyberinfrastructure planning w	1-25	Multi-state
16-Project Management	1	Invited Talk	Jessica, Crespo	Junior Faculty Leadership Trai	Intercultural communication/Intercultural competen	Faculty	1-25	Regional
	2	Invited Talk	Michener, William	Greater Western Library Allian	DataOne: transforming the research paradigm throug	Researchers	51-100	National
	3	Invited Talk	Michener, William	University of Idaho	DataOne: Enabling data intensive environmental res	Researchers	1-25	Regional
	4	Invited Talk	Michener, William	University of Tennessee	DataOne: Enabling data intensive biological and en	Researchers	1-25	Regional
	5	Invited Talk	Michener, William	Duke University	DataOne: a virtual data center for enabling intens	Researchers	1-25	Regional

	6	Invited Talk	Michener, William	Oakridge National Laboratory	DataOne: a virtual data center for enabling intens	Researchers	26-50	Regional
	7	Invited Talk	Michener, William	Incentives for Data Sharing in	history of data management policies	Researchers	1-25	National
	8	Invited Talk	Michener, William	LTER Meeting	Cyberinfrastructure and Climate Change Needs & App	Researchers	26-50	International

The most common form of presentation reported was invited talks. NM EPSCoR researchers and project management were invited to give talks in a variety of settings and on a range of topics. The climate and Hydrology group presented at the Tri-State meeting on the NM Observational Networks, and at the University of Southern California on "Residence time distributions in dynamic hydrologic systems". The later was for an international audience 51-100 researchers. A poster was also displayed at the American Geophysical Union conference on the "Assimilation of AATSR, MERIS and MODIS Data in the Snow Melt Runoff Model (SRM) on the Upper Rio Grande (USA)".

The Socioeconomics and Acequia group also presented at the Tri-State EPSCoR meeting and at the USDA CSREES national Water Conference. The later was a presentation on the "Modulation of River Flow by Irrigation System Surface Water-Ground Water Interactions" to over 100 researchers at the national level.

The Cyberinfrastructure group made two technical presentations at the Tri-State meeting: one on Geospatial Interoperability Standards and the other on Service Interfaces for Machine to Machine Communication. These were both part of setting the stage for climate change researchers in the three EPSCoR states to start thinking about how data sharing will take place.

The project PI, Dr. Michener, was invited to make a number of talks on the EPSCoR project and a related DataOne award. These were mostly related to the process of data management, data sharing and virtual data centers. Climate change researchers collect a lot of data and the process of how to make that data available to other researchers and the public continues to be a source of discussion.

Publications

Dissemination of the knowledge and research findings by EPSCoR researchers is an important outcome of the project. Figure 10 lists the presentations by researchers for each component.

Figure 10
Professional and Community Publications

Component	#	Source	Researcher	Citation	Status	Type of Publication	Date Published
1-Climate and Hydrology Research	1	NMSU	DEMOUCHE	Burgess, J. 2009. Water: A most valuable commodity, Las Cruces Magazine, Spring, 2009,	Published	Magazine Article	5/01/2009
	2	NMSU	DEMOUCHE	Las Cruces Sun News., 2009. NMSU Researchers Tracking Water Supply, Las Cruces Sun News, Jan 26, 2009.	Published	Newspaper Article	1/09/2009
	3	NMSU	DEMOUCHE	Olmsted, A., 2009. Mountain Snow Equals River Flow, NMSU Research & Resources, p 22-23.	Published	Magazine Article	3/01/2009
	4	NMSU	DEMOUCHE	Rango, A., Hurd, B., Gutzler, D.S., and Vivoni, E.R., 2009. Effects of Climate Change on Mountain Hydrology and Water Management in the Upper Rio Grande Watershed: Assessment Methods and Strategies, Climate Research, 32pp. In review	Submitted-under review	Journal Article	.
	5	NMSU	DEMOUCHE	Smith, A., Strand, E.K., Steele, et.al. 2008. Production of vegetation spatial-structure maps by per-object analysis of Juniper Encroachment in multitemperol aerial photographs, Canadian Journal of Remote Sensing, Vol. 34, Supplement S2, 2008. pp. S268-S285.	Published	Journal Article	11/01/2008
3-Socioeconomics and Acequia Research	1	NMSU	FERNALD CHERMAK	Burgess, J. 2009. Water: A most valuable commodity, Las Cruces Magazine, Spring, 2009,	Published	Magazine Article	5/01/2009
	2	NMSU	FERNALD	Fernald, A., Y. Cevik, C. Ochoa, C. Cusack., V. Tidwell, P. King, and S. Guldán. 2009. Modulation of river flow by irrigation system surface water-ground water interactions. Proceedings of the USDA CSREES National Water Conference. St. Louis, MO, February 8-12, 2009.	Accepted Awaiting Publication	Conference Proceedings	.
	3	NMSU	FERNALD	Las Cruces Sun News., 2009. NMSU Researchers Tracking Water Supply, Las Cruces Sun News, Jan 26, 2009.	Published	Newspaper Article	1/09/2009
	4	NMSU	FERNALD CHERMAK	Smith, A., Strand, E.K., Steele, et.al. 2008. Production of vegetation spatial-structure maps by per-object analysis of Juniper Encroachment in multitemperol aerial photographs, Canadian Journal of Remote Sensing, Vol. 34, Supplement S2, 2008. pp. S268-S285.	Published	Journal Article	11/01/2008
9-K-12 Professional Teacher Development	1	UNM	MITCHELL	"Rim to River": The Valles Caldera Field Experience Manual for High School Teachers	Published	Technical Report	6/01/2009
16-Project Management	1	UNM	MITCHELL	Climate Change Impacts on New Mexico Water Resources	Published	Poster	3/09/2009
Total	8	Unduplicated count of publications					

A total of 8 articles, reports and conference proceedings were reported for program year 1. Two journal articles appeared in Climate Research and Canadian Journal of Remote Sensing. Newspaper articles on

NMSU Researchers Tracking Water Supply appeared in the local newspaper, as well as a magazine article "Water: A Most Valuable Commodity". The K-12 Professional Teacher Development group produced a technical report called 'Rim to River', described the Valles Caldera field experiences for high school teachers. Project management put together a poster entitled Climate Change Impacts on NM Water Resources".

Patents

Since this was the first year of the initiative, there were not patent application submitted or awarded.

Outreach/Public Dissemination (Scientific Literacy, Public Presentations, Policymakers, Education)

Increasing the scientific literacy and understanding of scientific research in all levels of society is important to increasing the diversity of the scientific workforce. This includes all segments of society; including the general public, undergraduates, graduate students, junior faculty, and K-12 teachers. Each group needs different strategies and approaches which is evident from the education and public outreach activities conducted by the different component teams. Figure 11 lists the activities, types of activity/audience, and the actual/estimated numbers of participants involved by component.

**Figure 11
Education and Public Outreach Activities**

Component	#	Campus	Activity Contact	Type of Activity	Activity Name	Actual# or estimated# of Participants	Actual# or estimated# of Female Participants	Actual# or estimated# of Black, Hispanic, Native American Participants
1-Climate and Hydrology Research	1	NMSU	DeMouche	Community event	Integration of Hydrology and Meteorological Data for Small and Medium Size Farm Application	25	7	4
	2	NMSU	Steele	Education	Utah State: Spring Runoff Conference, Logan, Utah	100	50	7
	3	NMSU	Steele	Education	UROP Student Workshop	30	15	15
	Total						155	72
2-Water Quality Research	1	NMHU	Edward Martinez	PD workshop	Instrument Use	6	2	5
	2	NMHU	Edward Martinez	PD workshop	Instrument Use	6	2	5
	3	NMHU	Edward Martinez	PD workshop	Instrument Use	6	2	5
	Total						18	6
3-Socioeconomics and Acequia Research	1	NMSU	Fernald	Education	UROP Student Workshop	20	10	10
	2	NMSU	Fernald	Community event	Meeting with water managers and local producers of the Rio Hondo study site	20	10	10
	3	NMSU	Fernald	Community event	Meeting with water managers and local producers of the Rio Truchas study site	20	10	10
	4	NMSU	Guldan	Community event	Meeting with Alcalde Acequia Commission	20	10	10
	Total						80	40

7-Cyberinfrastructure	1	UNM	Renzo	UROP Student Data acquisition,	UROP	20	10	10
	Total					20	10	10
9-K-12 Professional Teacher Development	1	UNM	Mitchell	Summer Academy	Teacher Summer Institute	17	10	10
	Total					17	10	10
10-Undergraduate Research Opportunity Program	1	NMHU	Edward Martinez	REU	Instrument Use/Sample Analyses	2	2	5
	2	NMT	Majkowski	REU	Eastern New Mexico University UROP Recruiting Visit/Presentation	52	30	8
	3	NMT	Majkowski	REU	Northern New Mexico College UROP Recruiting Visit/Presentation	5	2	3
	4	NMT	Majkowski	REU	Southwestern Indian Polytechnic Institute UROP Recruiting Visit/Presentation	3	1	2
	5	NMT	Majkowski/Pullin	REU	Southwestern Indian Polytechnic Institute UROP Recruiting Visit/Presentation	40	10	40
	6	NMT	Pullin	REU	Dine College UROP Recruiting Visit/Presentation	55	25	50
	7	NMT	Pullin	REU	New Mexico Highlands University UROP Recruiting Visit/Presentation	20	10	15
	Total					177	80	123
13-Junior Faculty Leadership Training	1	UNM	Mitchener	Faculty Professional Development	Junior Faculty Leadership	11	3	0
	2	UNM	Mitchener	Faculty Professional Development	Junior Faculty Leadership	8	3	0
	Total					19	6	0
14-Public Outreach and Communication	1	NMMN HS	Everett	Community event	BioBlitz (a community biomonitoring event, "citizen science" program)	150	75	75
	Total					150	75	75
Total	All Components					636	299	299

Overall, approximately 600 participants were involved in one or more educational or public outreach activity supported by NM EPSCoR. It is estimated that half of these 600 were female and an equal number were a member of an underrepresented minority group in the sciences. The components approached their education/public outreach unique to their objectives. For instance, the Climate and Hydrology research component was involved in a community event demonstrating the integration of hydrology and

meteorological data in small and medium farms to 25 participants. This research group also conducted education training for 100 faculty at Utah State and a workshop for undergraduates during the UROP program.

The Socioeconomics and Acequia research group met with water managers and local producers in the study site areas to explain the purpose of the research and to involve them in the process. This group also provided training to undergraduates during the UROP summer workshop.

The Cyberinfrastructure team provided training and mentoring for two undergraduate students on the process of data acquisition in the context of climate change.

Seventeen K-12 teachers participated in a week long field experience at the Valles Caldera where they learned how scientific data is collected, analyzed and reported. They will be able to take these skills back to their classrooms which are all located in predominately Hispanic majority schools.

The component leaders of the UROP program conducted site visits to multiple undergraduate institutions around the state to inform faculty and students about the opportunity for undergraduates to participate in a research based program where they would gain skill in conducting research and learn about climate change, graduate education, scientific research and how they can be successful in graduate school. The UROP team made presentations to almost 200 faculty and undergraduates in non-PhD institutions to inform them about the UROP program.

Graduate students in the Graduate Research Training Group participated in multiple sessions on how to use instruments commonly used in climate change research.

The Junior Faculty Development component held its first three-day workshop for 19 junior faculty In January 2009. Specific focal areas included communication with decision-makers and the media, proposal development, management of large research projects, meeting facilitation, “broadening impacts” through education and outreach, community science to decision-makers and evaluation and assessment.

Finally, the Public Outreach and Communication team held a community event called BioBlitz, which was a citizen science program, attended by about 150 people.

Although there was an initial delay in receipt of funds and project activities were delayed by the need for a strategic plan, NM EPSCoR was able to accomplish most of their year 1 goals. Equipment for monitoring snow pack and streams were purchased and installed over the summer. The water sheds and streams for instrumentation were investigated for suitability and local support was garnered. Researchers began recruiting graduate students for their teams and the logistics of data storage and sharing was initiated by the cyberinfrastructure group. Education and outreach activities met their participant targets and were successfully implemented and evaluated.

Findings and Recommendations

The strategic plan that was developed in Year 1 for each component should be kept in the fore front. This does not mean to say that the original plan should not be changed as reality warrants. However, changes should be made explicit and considered in light of unintended consequences or implications with another component. There is a lot of integration between and among the research areas and education, which could get out of balance if the component leaders are not careful about following their strategic plan. The accompanying evaluation reports for each component will hopefully assist the project management team and the component leaders in keeping true to the strategic plan. Findings and recommendations for each component are presented below.

Component 1: Climate and hydrology

Overall, seven faculty were involved in the Climate and Hydrology research, including 1 female and 1 underrepresented minority. In addition, 3 graduate students and 8 undergraduates were also involved. Two of the students were female, while 6 were from an underrepresented minority group. The research team involved at least two UROP students in their work. There were a number (20) of collaborations occurring between the research team and others.

The acquisition of \$200K of equipment by NMSU for SNOTELL, SCAN and MRGCD stations. In addition, NMT acquired a Picarro Laser Spectroscopy and Water Isotope Analyzer, portable field laptop and a distributed temperature sensing system (DTA) for \$74k.

An additional, \$375K of funding was secured from USDA to support the research. The researchers also produced a journal publication with an article in the Canadian Journal of Climate Research. In addition, researchers gave two invited talks and presented one post to professional colleagues. Another journal article has also been submitted and is under review. Presentations were also made to both national and international researchers about their work.

Education and public outreach was undertaken by the research group during the first program year with the publication of an article in the local newspaper. In addition, there were two community magazine articles about water and mountain snows published. A community event on the integration of hydrology and meteorological data was also held. A workshop for undergraduates at the UROP/REU program at NMT was provided on the research being done.

The Climate and Hydrology research appears to be proceeding according to the strategic plan in most areas. The team could strengthen, or make more apparent, the collaborations that exist between the climatologists and hydrologists at the various institutions in New Mexico. It would be useful to report what was accomplished by these groups being able to work together with the EPSCoR funding. It will be important to begin documenting how climate and hydrology research in New Mexico is improved as a result of the data being collected with the EPSCoR funded instrumentation.

Component 2: Water Quality

This component involved 9 faculty, 2 undergraduates, 4 graduate and 1 staff-technical person in research, including 31% female and 19% URM. Almost \$125K of equipment was ordered for NMHU, including Absorption Spectrophotometer, Ion Chromatograph and \$30K for equipment at UNM, including an Aqua Sentinel Analyzer and Yellow Springs. A total of 4 proposals requesting \$4.2million were submitted by researchers and USDA awarded funding of \$300K for recruiting and retention of URM

The water quality researchers accomplished their objectives for the year and are working with other researchers in the Valles Caldera to establish a protected research study site. The component researchers in Year 2 should continue monitoring the data from the VCNP and begin looking at other sites for sensor deployment. Implement the activities and deliverables stated in the Strategic Plan for Year 2, especially the conference presentations and peer reviewed journal articles to begin disseminating their findings from the initial deployment of instrumentation in this watershed.

Component 3: Socioeconomics and Acequia Research

The research on socioeconomics and Acequia involved 7 faculty and 2 staff-technical persons, including 22% female and 33% URM. These included faculty from 3 NM universities and Sandia National Lab. They collaborated with 7 other researchers on additional proposals and community contacts

Ordered almost \$69K of equipment for 16 stream flow stations, 2 field laptops, detailed imagery of the Rio Hondo and Rio Truchas study sites, 2 weather stations, 4 soil moisture stations and all necessary supplies for Rio Hondo and Rio Brazo sites

Researchers submitted two proposals: “Hydrologic and Socio-Economic Strategies to Enhance Water Savings in Western US irrigated River Valleys” and “Multi-disciplinary Approach for a Better Understanding of the Hydro-socio-economic Relationships of Traditional Irrigation System Communities in Northern New Mexico” .

The researchers gave two presentations to professional colleagues. One at a national meeting of the USDA CSREES National Water Conference and the other at the Tri-State EPSCoR meeting. Education and public outreach was undertaken by the research group during the first program year with multi-meetings with water managers and local produces in the water basin study areas.

The component researchers appear to be on track, with equipment being purchased and installation occurring during the summer. The group has made good progress in establishing relationships with the water managers and local producers in the study areas, but will need to move slowly. Water is sacred in rural New Mexico and relationships take time to develop. The process of how scientists develop working relationships with local water managers is critical to the success of this group. It is important to document these activities and report the success and failures that occur along the way. Increase the professional presentations, publications and public outreach.

Component 4: Critical Gap Infrastructure for NMHU

Approximately \$125k of water quality testing equipment was purchased and installed in the Hilton Science building on the NM Highlands University campus. This included a Graphite Furnace Atomic Absorption Spectrophotometer, Ion Chromatograph System and a Total Organic Carbon Analyzer. In addition, a Automated Chemistry analyzer, Programmable Digestion System Hydrolab and Water Quality Sonde were purchased with NSF-MRI funding and installed. Training was also provided for the PI and graduate students.

The researchers have made good progress in filling the critical gap in water quality equipment at NMHU. They even leveraged RII funding with funding from the NSF-MRI program to purchase additional equipment. The lab technician hired during Year 1 should be continued and additional training should be provided in Year 2 in the use and maintenance of the equipment. As the EPSCoR water quality research proceeds it will be important to highlight the role that this equipment makes in the research and the education of students at NMHU.

Component 5: Innovation Working Groups

While no IWGs were held, two IWGs were awarded during Program Year 1. It will be important to assess the success of these first awards and make any changes to the process that may be necessary. In future program years, after there has been more IWG activities, EPSCoR may want to look at ways to sustain the process with non-EPSCoR funding. However, since the success of an IWG is partially based on the submission and funding of a proposal, a complete assessment of this process should not occur until there has been adequate time to receive a funding decision. A review of the IWG component should probably take place in Year 3 and include feedback from IWG recipients and participants, as well as the success rate of proposals submitted as a result of an IWG.

Component 6: Critical Infrastructure Gap Seed Awards

While no awards were planned for this program year, progress on developing the award template was made. When further developing the proposal template and RFP in subsequent program years, project staff may want to include faculty from the 4 year institutions in crafting these documents. The time constraints at the undergraduate institutions can be quite different from those at the PhD granting institutions and can vary widely from institution to institution.

Component 7: Cyberinfrastructure Improvements

The cyberinfrastructure group involved 1 RII management team member, 1 staff-technical person and 1 consultant, including 0% female and 33% URM. Two undergraduate students were hosted during the summer. The group collaborated with 19 researchers and technical people from across the Tri-state initiative on cyberinfrastructure; 3 of which are involved in the NM project

The CI component members were heavily involved in the development of the Track 2 "Cyberinfrastructure Development for the Western Consortium of Idaho, Nevada and New Mexico" proposal. The NM CI team has also been the lead in facilitating the development of data standards across the Tri-State Western Consortium.

Dr. Benedict made two presentations at the EPSCoR Tri-state meeting in Boise; one entitled "Geospatial Interoperability Standards" and "Service Interfaces for Machine to Machine Communication were produced for the Tristate CI meeting". The group also hosted two undergraduate students from San Juan College in Farmington, NM as part of the UROP. These students worked with EDAC staff in evaluating NM EPSCoR data products and developing FGDC metadata for products that meet criteria for long-term retention and delivery through the planned NM EPSCoR data portal.

The cyberinfrastructure component for the most part conducted their Year 1 activities and achieved the milestones proposed in the Strategic Plan. The CI group may want to examine the way it works with NM EPSCoR researchers, as separate from the Tri-State working group, to ensure that their CI needs are addressed. This group may want to consider expanding to include CI professionals from other NM universities and partners involved in climate change research.

Component 8: Enhance Diversity

The diversity component directly involved 2 faculty and 1 staff-technical person in activities, including 67% female and 0% URM and included faculty from 2 NM universities and the state office. This does not include the researchers and leaders in the other NM EPSCoR components who are also striving to increase the diversity of their programs, and include women and underrepresented minorities in all their activities.

The faculty submitted an IWG to NM EPSCoR and was awarded \$10k in funds to convene a working group on the issue of diversity in Program Year 2.

The project reported diversity statistics in its annual report and has shown strong efforts in promoting diversity. While the proposed component lead was not hired, leadership has been assumed by two faculty members; one of whom has a long term appointment at a tribal college. Both faculty members have extensive expertise in diversity issues and have been involved in the training of undergraduates researchers. The IWG to be held during Year 2 should help provide a more detailed plan for NM EPSCoR with regards to the steps it needs to take to address this critical area.

Component 9: Professional Teacher Development Program

This activity was led by 3 consultants and served 14 K-12 teachers, including 71% female and 59% URM. Ten (71%) are female and the other four (29%) are male. They were all science teachers in middle or high school in the school year prior to the institute. The participants' ethnic distribution included 8 (57%) Hispanic, 5 (36%) White and 1 (7%) Native American.

An analysis of teacher pre-post-followup surveys found the following results:

The percent of teachers who responded that their skill/knowledge was 'Some' or 'A lot' increased 40 percent points from Pre to Post institute in the following areas: 'Conducting field observations for research' (Pre: 42%; Post: 100%); 'Knowing techniques of water testing' (Pre: 42%; Post: 100%); 'Knowing techniques used in forest evaluation' (Pre: 52%; Post: 100%); 'Incorporating field experiences in my teaching' (Pre: 58%; Post: 100%); 'Identifying limitations of research methods and designs (Pre: 58%; Post: 100%); 'Knowing the science content of plants' (Pre: 42%; Post: 83%); and 'Knowing techniques of soil testing' (Pre: 42%; Post: 83%).

There was very little change in the percentage of teachers who 'Agree' or 'Strongly Agree' to the statements on climate change between the pre and post survey. There was higher percentage of teachers on the post survey that felt 'The Earth's temperature has been constant over geologic time' (Pre: 15%; 38%). However, that percentage reverted back to 13% on the followup survey. There was also a decrease in the percent who agreed with the statement that 'Better understanding of snow-melt hydrology will allow for better climate model' (pre: 92%; Post: 77%; Fup: 73%). But in general, teachers knowledge/attitudes about climate change did not change as a result of the institute.

The statements where the percent of participants who indicated the statement would 'Often' or 'Almost Always' occur in the scientific process changed 10 percentage points or more from pre to post surveys on the following: 'Scientific observations are affected by scientists' values and beliefs' (Pre: 25%; Post: 50%); 'Scientific inquiry starts with observations of nature' (Pre: 100%; Post: 75%); 'Scientific knowledge is tentative' (Pr: 42%; Post: 63%); 'When making observations, scientists eliminate their beliefs and values' (Pre: 42%; Post: 25%); 'Intuition plays a role in scientific inquiry' (Pre: 25%; Post: 38%) and 'Scientific knowledge is influenced by myths' (Pre: 0%; Post: 13%).

There were only two statements where the percentage of respondents changed more than ten percentage points from pre to post on questions about attitudes/beliefs about teaching. The percent who agreed that 'Using inquiry methods to teach math and science is hard' decreased from 64% on the pre to 18% on the post; while a similar pattern was exhibited in the response to 'My students take the initiative to observe and question phenomena' (Pre: 55%; Post: 36%).

Over 90% of participants reported their skills increased 'A lot' or 'A great deal' on the following skills: 'Your science content knowledge' (100%); 'Your field observation skills' (100%), 'Skill in water testing' (100%), 'Using environment as an outdoor classroom' (93%), 'Developing curricula integrating science and math' (93%), and 'Skill in soil testing' (93%).

The component that received the highest rating for contributing 'A lot' or 'A great deal' to the overall institute was 'Conducting field work with scientists, in general, during Valles' (100%). The components that were rated least highly had to do with the lesson plans. Fewer than three-fourths rated the following as contributing 'A lot' or 'A great deal': 'Implementation of lessons developed as a result of Valles' (57%); 'Interaction with other participants after Valles' (64%) and 'Curriculum and lesson plan development after Valles' (71%). However, 86% felt the 'Curriculum development during the week at Valles' did contribute to the overall program and their learning.

Teachers overwhelmingly felt the Institute met and in most cases exceeded their expectations. "Went beyond my expectations, created a cohort of peers that can be used to develop curricula and solve issues that arise. Also, presented curriculum ideas that can be used as in

Program participants found little fault with the program. The design and content of the program appears to be meeting the needs of teachers. However, the curriculum development aspect could be the weakest area, with some concern from participants about its usefulness. The program leads may want to revisit the purpose and implementation of this aspect. There was a lack of EPSCoR scientist involvement in the Institute and this should be rectified in coming years. Although the scientists that were involved were well respected and taught the teachers similar content and equipment use, NM EPSCoR scientists should be able to expand the linkage between the equipment use and its relationship with climate change research.

The proposed concept of identifying teams of teachers to participate was not implemented during this first year. The original concept was to include teachers from different disciplines so that the teaching of the science related to climate change could have the benefit to students of integrating science, math, history, social studies, etc. in the understanding of the implications. NM EPSCoR has four research component, some of which are looking at the economic and cultural impacts of climate change. The expansion of this program to include these other research areas could excite students from Northern NM communities.

Component 10: Undergraduate Research Opportunity Program

UROP was managed by 3 faculty, 1 staff-technical and served 10 undergraduate program participants. The faculty/staff gender and ethnic breakdown was 50% female, 25% URM, while the undergraduate diversity was 60% female and 40% URM. The undergraduate participants were from 4 different (SJU, NNMC, NMHU, ENMU) institutions. UROP collaborated with a variety of EPSCoR researchers as presenters and mentors for students. These included faculty at 5 different campuses and in almost all EPSCoR research areas.

An analysis of UROP student responses on a 6-month followup survey compared to a pre-survey found the following:

Students' self reported level of confidence increased most from pre-UROP to 6 months after UROP in the following areas: 'Finding trends in data' (Pre: 57%; Post: 86%); 'Designing questions for investigations' (Pre: 43%; Post: 86%); 'Writing clearly and concisely' (Pre: 57%; Post: 100%); and 'Defining problems' (Pre: 71%; Post: 100%).

Students' understanding of climate change was little changed from pre-UROP to 6 months after UROP. A smaller percentage reported that they 'Agree' or 'Strongly Agree' with the following statements: Climate change models predict that the 'Earth's temperature will rise up to 6 degree C over the next 100 years' (Pre: 71%; Post: 43%) and 'There are long-term environmental effects caused by climate change' (Pre: 100%; Post: 71%).

Students' knowledge of aspects of high education changed some from pre-UROP to 6 months after UROP. A higher percentage agreed with the statement 'All PhD graduates must complete a post-

doc before getting a job as a research scientist' (Pre: 14%; Post: 43%) after the program as before. There was also some slight increases in knowing that research departments pay graduate students to attend school; graduate degrees require fewer credit hours than undergraduate degrees and a PhD is required to be a university professor.

Students' opinions about science and scientific inquiry also changed from the Pre-UROP survey to the 6 month followup. A higher percentage of students, on the 6 month followup than the pre-survey, had the opinion that each of the following statements occurred more 'Often' or 'Almost Always': 'Scientific inquiry involves challenging other scientists' idea' (Pre: 43%; Post: 71%); 'Intuition plays a role in scientific inquiry' (Pre: 43%; Post: 71%); 'When making observations, scientists eliminate their beliefs and values' (Pre: 14%; Post: 43%) and 'Scientific knowledge is tentative' (Pre: 14%; Post: 43%).

Students were more likely to be 'Pretty Sure' or 'Very Sure' on the followup survey on the following questions about their future: 'I know the field I want to major in in graduate school' (Pre: 50%; Post: 83%) and 'I know what type of school I would like to attend for graduate school' (Pre: 50%; Post: 83%). They drastically less likely to be 'Pretty Sure' or 'Very Sure' with respect to the following: 'If I want to go to graduate school, I will find a way to pay for it' (Pre: 100%; Post: 17%).

On questions that were only asked on the six-month post survey. We found the following:

The UROP experience increased their skill 'A lot' or 'A Great Deal' in all areas surveyed, more than 50% reported an increase in skill in the following: 'Analyzing Data' (71%); 'Working effectively with others' (71%); 'Conducting observations' (57%); 'Using specialized software' (57%); 'Writing clearly and concisely' (57%) and 'Finding trends in data' (57%).

Students reported the UROP experience increased their understanding 'A lot' or 'A Great Deal' in all areas surveyed, with more than 80% reporting an increase in the following: 'Impact of climate change on New Mexico' (86%) and 'Importance of snow melt on climate change models' (86%). the two areas with the least reported increase in understanding were: 'The graduate school application process' (57%) and 'Career opportunities in science' (57%).

More than 80% of the students reported that they 'Agree' or 'Strongly Agree' with following questions about their mentors: 'Explained to you the expectations, goals, responsibilities?' (86%); 'Presented information/tasks appropriate to your level of understanding?' (86%) and 'Was available for you to ask questions when needed?' (86%). Mentors were reported to have least likely 'Provided opportunity for you to talk about graduate school, careers and being a research scientist?' (43%).

The UROP staff did a good job of recruitment in visiting multiple schools around the state and receiving applications from many of the four year, non-PhD granting institutions. The URM distribution would have been better, but two Native American students were accepted into another NMT REU program. Students who participated in UROP noted the quality of NMT as one reason for applying. They also wanted an opportunity to learn about research and climate change. Most expressed an interest in the environment and climate change. The following response is typical: "This program allows me to work with real scientists and conduct real research, rather than a lab experiment that has a known end".

Program participants found little fault with the program, other than a slight lack of organization, which they attributed to being the program's first year. The design and content of the program appears to be

meeting the needs of students. Mentors in most situations were well liked and supportive. They were also rated well in explaining expectations, presenting information and being available to ask questions. One area of mentorship that might be improved is to provide opportunities for UROP students to talk about graduate school, careers and being a research scientist.

Component 11: Graduate Research Training

A 3-day summer workshop in mesoscale climate modeling was held in the summer of 2009. The workshop is titled: “*Simulating the Spatial Temporal Patterns of Anthropogenic Climate Change: A Workshop in the Bridging Disciplines, Bridging Scale Series*”, and was supported by the Los Alamos Institute for Advanced Studies, Los Alamos National Laboratory Center for Nonlinear Studies and New Mexico EPSCoR Program. Presenters and attendees were nationally-known experts, in addition to scientists from the Western Tri-State Consortium – New Mexico, Idaho and Nevada.

The workshop on modeling at LANL during the summer should help in the development of the graduate research training course to be offered in subsequent years. Ensure that graduate students from across the state have ample notice of when the Climate Change Graduate Seminar Course will be available. How credit for the course will be assigned at each institution may be a challenge for the project. It may take longer than anticipated to implement the course, as NM institutions have not worked well in the past regarding incorporating courses from another institution.

Component 12: NSF Days

The state office has begun working with NSF to establish a date for NSF Days. The project is dependent on when NSF program officers and staff are available before establishing a date for the event. These events can be time consuming to plan and conduct, and can also include visitors from the National Science Board. Once a date is established, EPSCoR researchers should be made aware of the opportunity to showcase their research.

Component 13: Faculty Leadership Program

The first Junior Faculty Leadership Program had good attendance of faculty from a variety of institutions. The program was rated very well by the participants, with few negatives identified. There a few suggestions for improvement, such as shortening the day, add name tags, add more interactive programs, and more on proposal development and project management.

Participants highly rated the **quality of the content** for nine of the ten presentations. The presentation of 'Building and maintaining a laboratory web site' by Marshall received the lowest rating, with only two-thirds (67%) of the participants giving it a rating of 4 or 5.

Similarly, to the prior question, participants highly rated the **quality of the presentations** for nine of the ten presentations. The presentation of 'Building and maintaining a laboratory web site' by Marshall again received the lowest rating, with 83% of the participants giving it a rating of 4 or 5.

Participants did not rate the **visuals/materials/handouts/activities** as highly as they did the content and presentation. Three of the presentations were rated relatively low for their materials: 'Writing successful proposals and managing research projects' (79%); 'Building and maintaining a laboratory web site' (79%) and 'Best data practices and solutions for office and lab cyberinfrastructure' (80%).

Overall, the participants rated the program very highly, with almost 90% agreement on all aspects of the program. The lowest rated question was 'the program increased my leadership skills in the area of management of research projects' (84%).

The presentation 'Building and maintaining a laboratory web site' was not well received. Participants do not need the level of technical expertise provided in the presentation. It may be more helpful to focus on the design of web sites, as opposed to how to build and maintain a site. Also, provide more interactive activities and less presentations. Topics to consider may be: proposal development and writing, collaborative research and how to manage, how to collaborate with other faculty in NM, and interdisciplinary collaboration.

Component 14: Public Outreach and Communication

The outreach component involved 2 consultants and 1 RII management team member, including 67% female and 0% URM. They collaborated with the Association of Science and Technology Centers. About \$1k of computer equipment was expended for managing outreach activities.

BioBlitz, a community bio-monitoring event, or "citizen science" program was held in partnership with Communicating Climate Change grant from the Association of Science and Technology Centers. The event was attended by approximately 150 people.

The component worked on planning the Climate Change Exhibit for the museum. This included the involvement of a well respected climate change researcher from UNM who is able to communicate the material well with the general public. An outreach coordinator was hired at the end of Year 1 and the museum can begin planning and offering the science cafes and seminar series in Year 2.

The museum may want to consider involving more EPSCoR research faculty in their future outreach activities. By the end of Year 2, faculty will begin to have locally relevant climate data that may be of interest to New Mexicans.