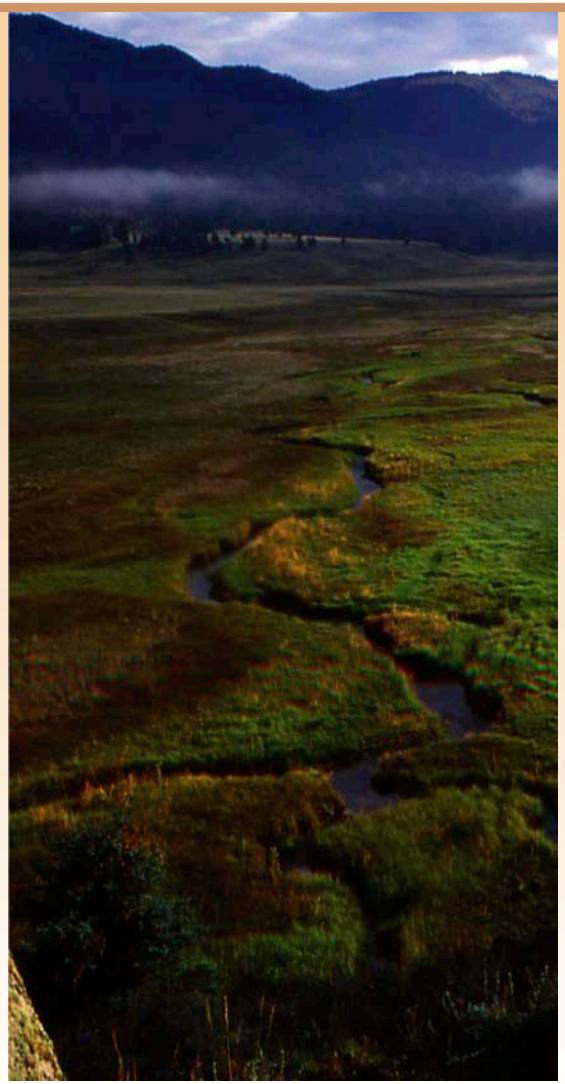
New Mexico EPSCoR



New Mexico EPSCoR

All Hands Meeting

30 September 2011

Bill Michener, PI/Director

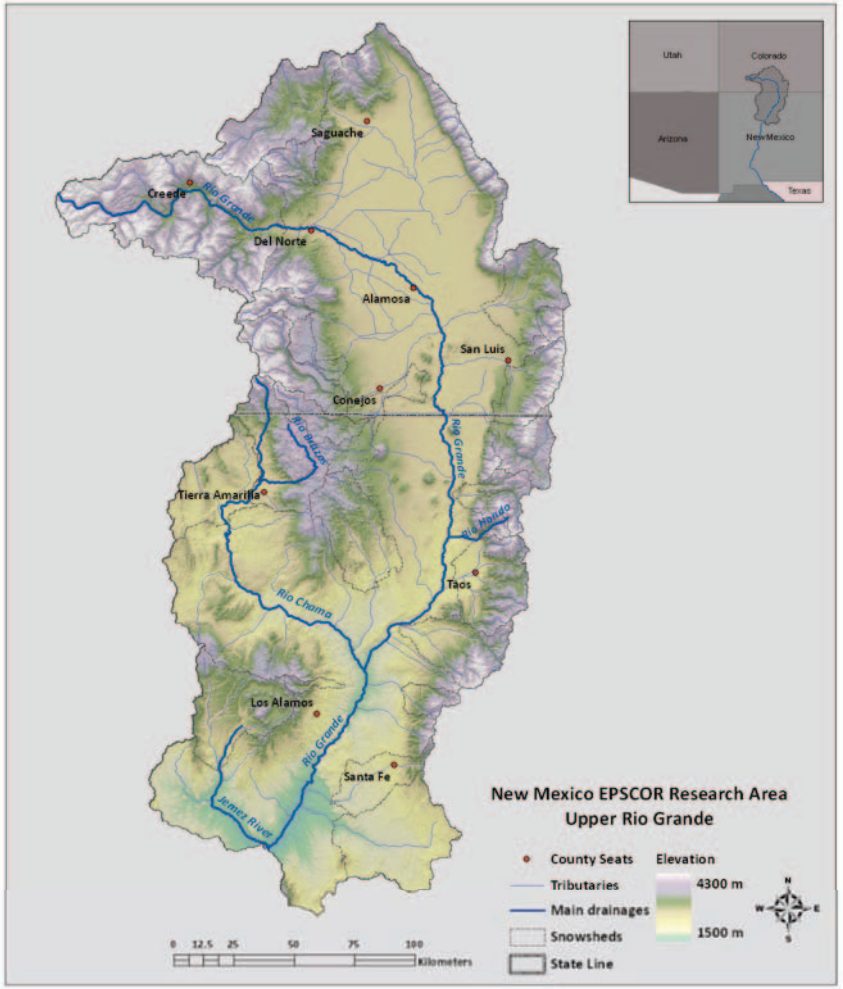
Mary Jo Daniel, Associate Director

Goals of Today's Meeting

- Update on project activities and progress towards strategic objectives
- Promote and enhance inter-disciplinary and inter-institutional collaborations
- Focus on impacts and outcomes of NM EPSCoR investments
- Chart the path forward for next year(s) and review the plan for the next RII proposal

EPSCoR RII 3 Focus: Climate Impacts on New Mexico's Mountain Sources of Water

- Mission: "Provide the critical gap infrastructure, computational support, and education and outreach opportunities to foster excellence in climate change research and collaboration"
- 2008-2013



Strategic Plan-Research Infrastructure

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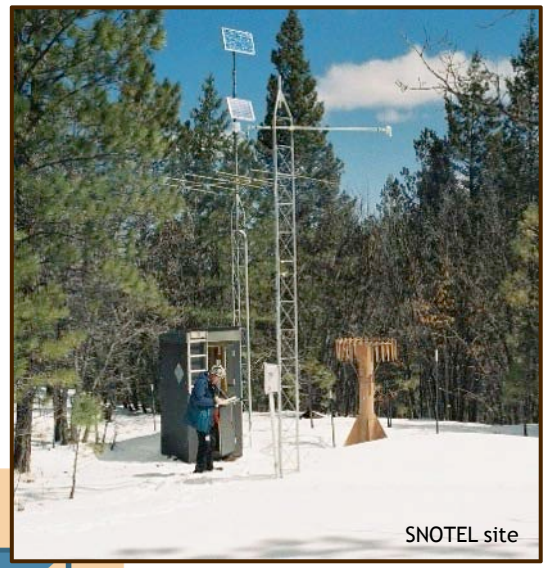
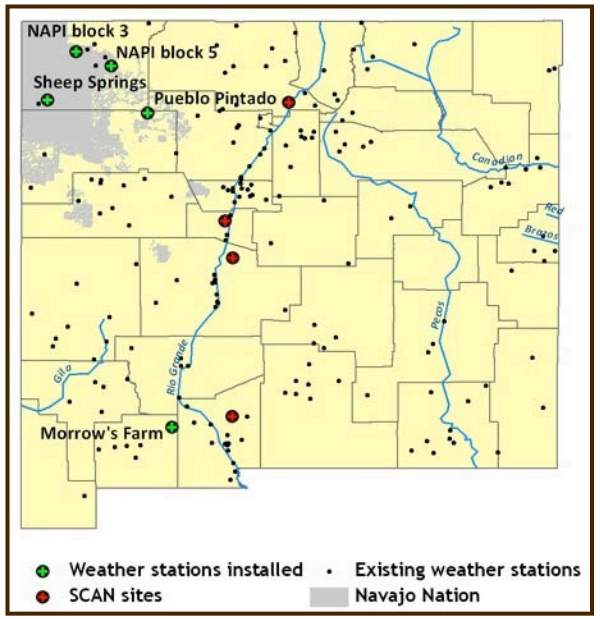
Objective 1: Enhance Climate and Hydrology Research Infrastructure

- Significantly upgraded and/or installed meteorological stations throughout NM, including 4 on the Navajo Nation
- Installed 4 NRCS SCAN sites in the Rio Grande basin
- Upgraded SNOTEL sites and installed Enhanced SNOTEL sites
- Installed a network of precipitation collectors in the Rio Hondo watershed for isotope sampling


SNOTEL site


Weather station near Farmington, NM



Objective 2: Improve Water Quality Monitoring in High Altitude Stream Environments

- Equipping a cargo trailer with water quality sensors to provide continuous, year-round water quality data at the Valles Caldera National Preserve (VCNP)
- The hydrology and water quality groups installed and instrumented a network of 34 shallow monitoring wells with continuous water level data-loggers and selected deployment of real-time nutrient and water quality analyzers
- Constructed and tested a prototype of an autonomous *in situ* iron sensor

Objective 3: Develop interdisciplinary socioeconomics and acequia research capacity

- Employed a full time hydro-meteorological technician
- Hydrologic instrumentation of acequias
- Field campaigns in acequias for gathering streamflow data

Flume installed in an acequia off the Rio Hondo to measure acequia flow

Objective 4: Provide Critical Gap Infrastructure for New Mexico Highlands University

- Upgraded the aquatic chemistry laboratory for water quality analysis:
  - Automated water chemistry analyzer
  - Ion Chromatograph
  - TOC Analyzer
  - Graphite Furnace Atomic Absorption
  - Water quality sonde
  - Undergrad and Grad student support
- Four graduate student research projects
- Four undergraduate research projects
- Four UROP research projects

Objective 5: [illegible]

- *Natural and Human Dynamics of Acequia Systems*
  - Sam Fernald, NMSU
- *Identifying the Most Relevant Spatial and Temporal Scales of Climate Change with Respect to Hydrologic Processes*
  - Amanda White, NMT (Post-doc)
- *The New Mexico STEM Higher Education Diversity Network*
  - Mike Pullin, NMT; Marnie Carroll, Dine College; Edward Martinez, NMHU

- *Bridging the Gap Between Data and the 6-12 Science Classroom*
  - Matthew Nyman, UNM
- *Applications of Distributed Temperature Sensing for Climate Change Research in NM*
  - Jevon Harding, NMT (Graduate Student)

Objective 6: Provide Critical Infrastructure Gap Seed Awards to NM's non-PhD granting universities

- The Whiskey Creek Educational Watershed: A Collaboration between Dine College and NM Tech
  - Marnie Carroll, Diné College
- Late Pleistocene to Holocene Paleoclimate of Northern New Mexico: a Multidisciplinary Science Educational Endeavor
  - Edward Martinez, NMHU

Whiskey Creek, looking East from Navajo Route 12

Wallace Lake, Las Vegas National Wildlife Refuge

Newest Infrastructure Seed Awards (Sept. 2011)

- Synergistic effects of climate change and invasive species on native fauna in a highland aquatic ecosystem
  - Jesus Rivas, NMHU
- Tracing the Impacts of Prehistoric Climate Change: Eastern New Mexico's Water Resources across the Pleistocene-Holocene Transition
  - David Kilby, ENMU
- Bringing Climate Research to UNM Los Alamos: Development and Infrastructure Improvement for the Environmental Science Program
  - Donald Davis, UNM Los Alamos

Strategic Plan-Cyberinfrastructure

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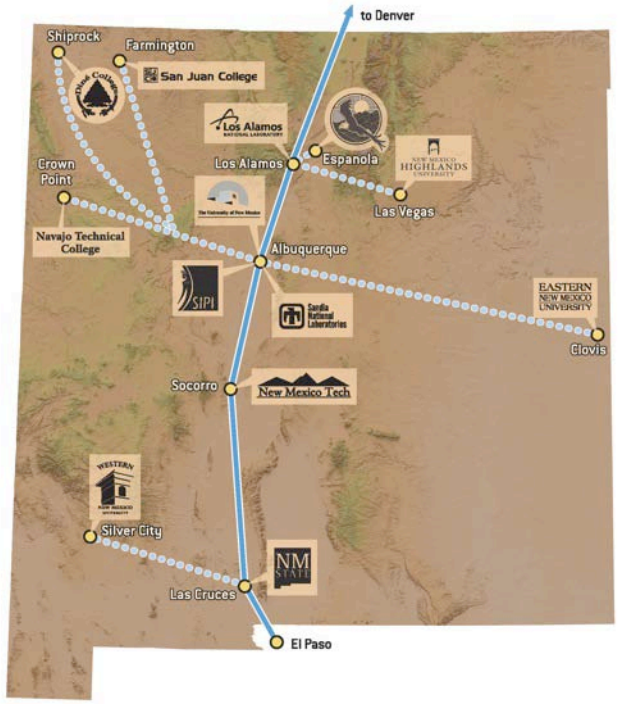
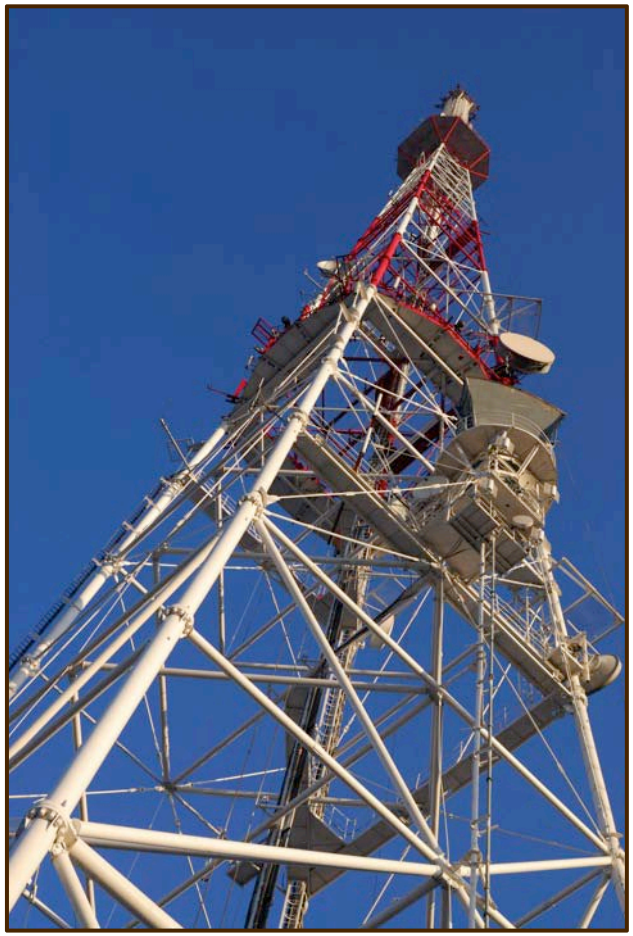
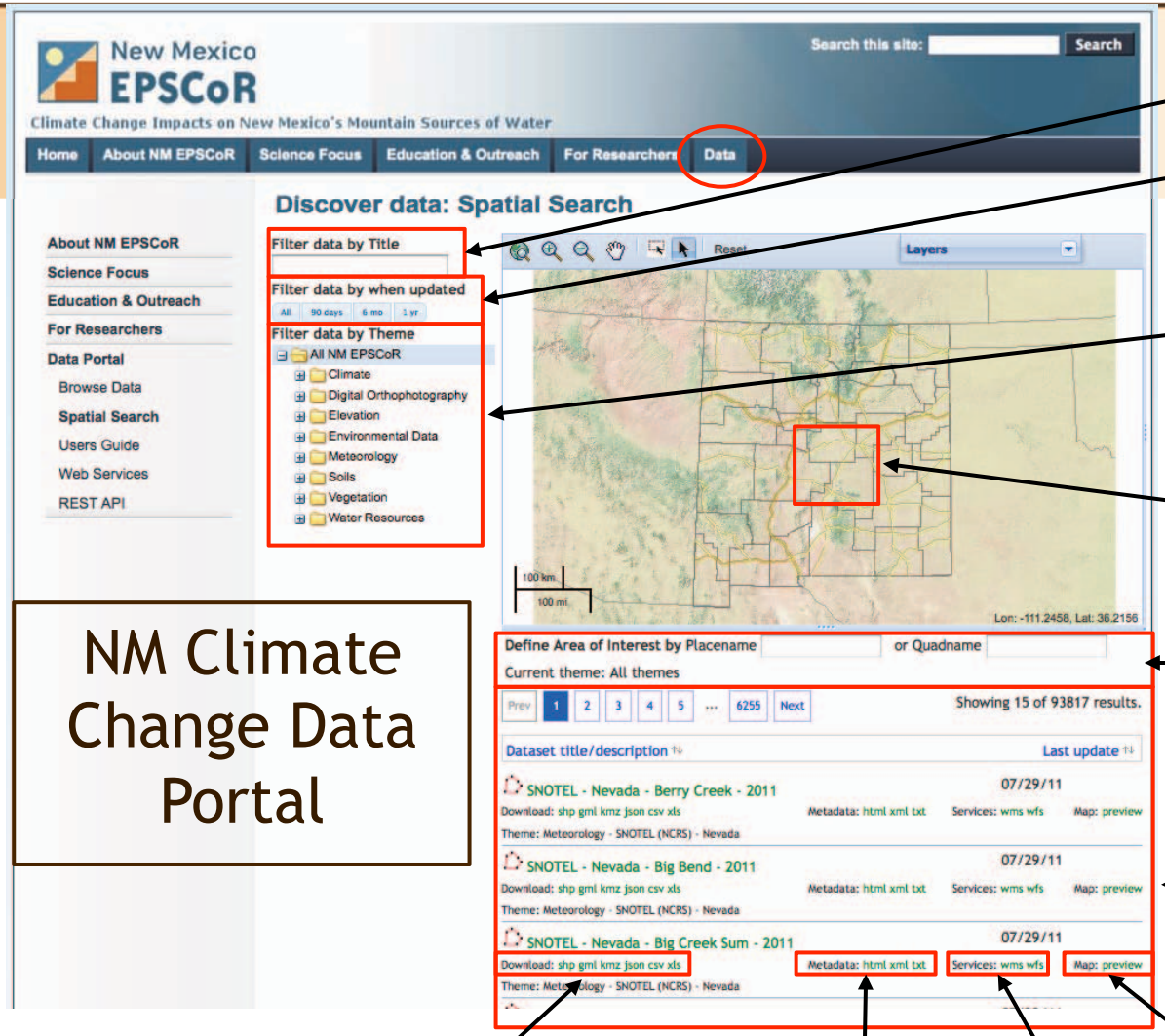




Objective 7: Cyberinfrastructure

- NM EPSCoR Program portal established and maintained with regular updates from NM EPSCoR Staff
  - News
  - Events
  - Focus Areas
  - Data
  - Connections to social media and mailing list

http://nmepscor.org/



NM Climate Change Data Portal

Search by text in title

Search by update date

Select by thematic category

Spatial search by map location

Spatial search by place/quad name

Result of data product search

Multiple download formats

Multiple metadata formats

Available web services

Interactive live data preview

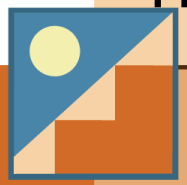
Strategic Plan-Human Infrastructure

8. Enhance diversity in all elements of the EPSCoR Program
9. Enhance professional teacher development for STEM areas in northern New Mexico
10. Develop an Undergraduate Research Opportunity Program that increases the exposure of students at non-PhD granting institutions to high quality, relevant, hypothesis-driven research
11. Design and develop graduate research training group opportunities
12. Inform faculty about funding opportunities via NSF Days
13. Enhance leadership skills for faculty via a Faculty Leadership Workshop Program
14. Create a citizenry that is informed about climate change and its impact on NM's natural resources via public outreach and communication

Source: NM EPSCoR Strategic Plan

Objective 8: Enhance Diversity in EPSCoR Program

- Diversity embedded in all elements of EPSCoR Program
  - UROP
  - Summer Teacher Institute
  - Junior Faculty Leadership Workshop
- Revised NM EPSCoR Diversity Plan to support leadership development of women and URM
  - Innovation Working Groups
  - Seed Award Proposals
  - Encouraged to make presentations at science meetings
  - Formed Diversity Leadership Team
- Best Practices for Faculty Diversity Guide
- Tri-State Diversity Strategic Plan



Objective 9: Enhance Teacher Professional Development

- Annual Summer Teacher Institute
  - 5-day field course, Valles Caldera National Preserve
    - Engaged in experiential learning and field research
    - Worked with EPSCoR water quality scientists
  - Saturday sessions through school year
  - Developed classroom materials
  - Student/Class Field Trips
  - Teachers from 18 Northern NM districts have participated
  - Classroom support by “Circuit Riders”

2011 Summer Teacher Institute participants conduct water quality experiments at the VCNP

Objective 10: Undergraduate Research Opportunity Program (UROP)

- Focused on underrepresented minority students, recruited from NM non-PhD granting schools
  - 10 students per year in teams of 2 with faculty mentor
    - Students have been from 9 different institutions
    - 2011 Cohort: 70% URM and 60% female
  - One week introductory classes and workshops at NMT
  - 8-week summer research experience
  - Culminates in a research conference

2011 UROP Participants

Objective 11: Graduate Research Training

- Fund students in hydrology, biology, chemistry, earth and planetary sciences & natural resources
  - Number of graduate students has increased from 10 to 21
  - Number of undergraduates has increased from 20 to 44
- Interdisciplinary Modeling: Water-Related Issues and Climate Change
  - 3 week workshop summer 2010—Tri-State Consortium
  - 7 students from NM (3 instructors from NM)
- Funded student professional development
  - CUAHSI HIS training
  - Introduction to Climate Modeling Workshop
  - Fall GSA & AGU
  - Parallel Programming and Cluster Computing

Objective 12: NSF Day

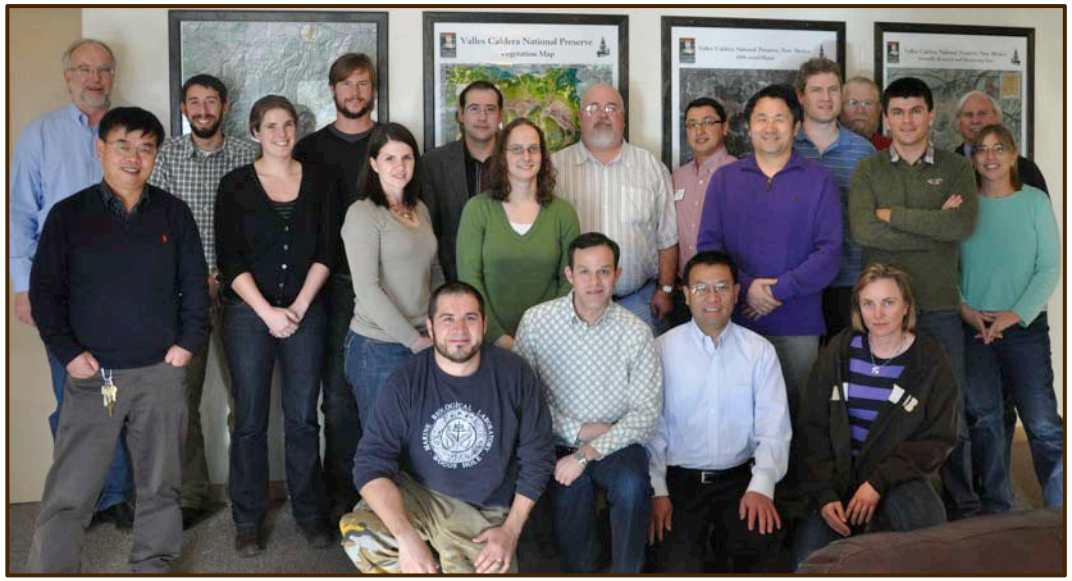
- March 17, 2011
- >150 Participants
- 9 NSF Programs
- Sessions Included:
  - NSF Proposal and Merit Review Process
  - Proposal Writing
  - Concurrent Directorate Sessions
  - Session for Community and Tribal Colleges

NSF Day participants listen to the Welcome speaker

Attendees of the Education session share a laugh

Objective 13:Junior Faculty Leadership Program

- Intense 3-day program offered annually
- Expanded to include Tri-State partners
- Very highly rated by participants
- Evaluation results used to improve content each year



Objective 14: Public Outreach and Communication

- "Degrees of Change: New Mexico's Climate Future" opened May 2011
  - 800 sq. ft. exhibit
  - Features "Magic Planet" dynamic earth processes projection
  - New prototype "Ambient Table" uses visualization technology
  - Focuses on EPSCoR research and researchers

NM EPSCoR Successes

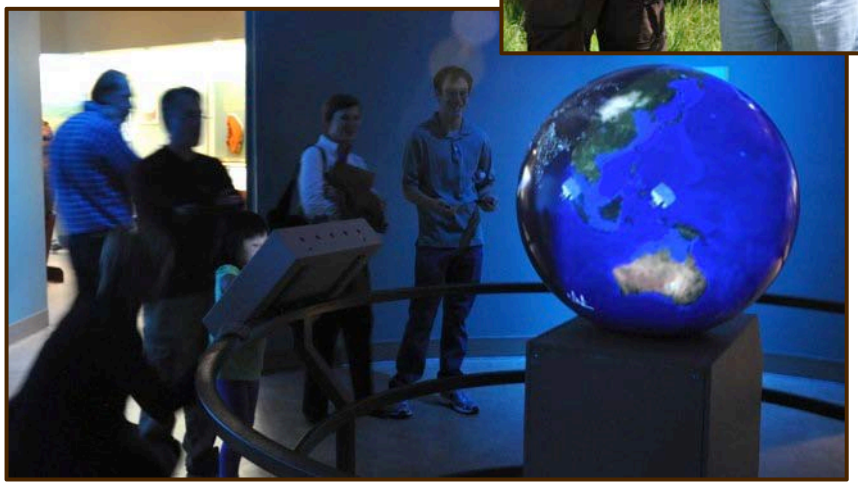
- Research Infrastructure
  - Hydrologic and meteorologic observation network on a par with other Western states
  - Upgraded chemistry laboratories at NMHU and NMT providing enhanced research and education opportunities for students
  - Real-time, continuous water chemistry monitoring network

NM EPSCoR Successes

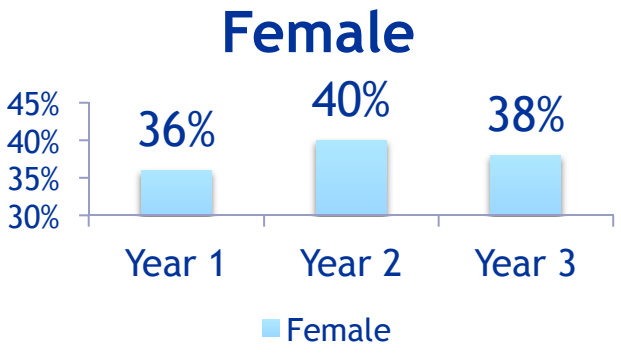
- Cyberinfrastructure
  - Scalable infrastructure for flexible data/information delivery
  - Leadership role in developing interoperability standards for Western Tri-State Consortium
  - Coordination between researchers for enhanced data management and sharing

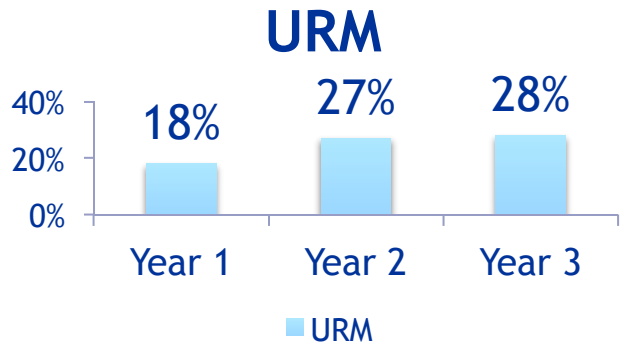
NM EPSCoR Successes

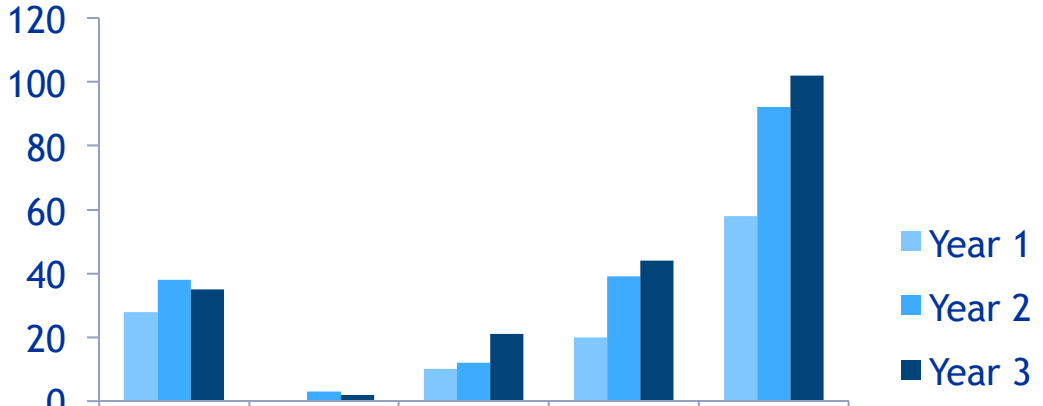
- Human Infrastructure
  - Teachers from 27 schools in Northern NM received professional development in experimental field methods and climate science
  - 30 undergraduate students in UROP with EPSCoR mentors
  - “Degrees of Change: New Mexico’s Climate Forecast” opened; 250,000 annual visitors
  - Best Practices Guide for Faculty Diversity created and approved by the Council of University Presidents



Participants in NM EPSCoR RII3







	Faculty	Post Docs	Grad Students	Undergrad	Total
Year 1	28	0	10	20	58
Year 2	38	3	12	39	92
Year 3	35	2	21	44	102

Project Timeline (original proposal)

Research
Install climate stations
Upgrade chemistry labs
Deploy hydrometeorological stations and water quality sensor systems
Infrastructure seed grant program
Multi-scale model development
Innovation working groups

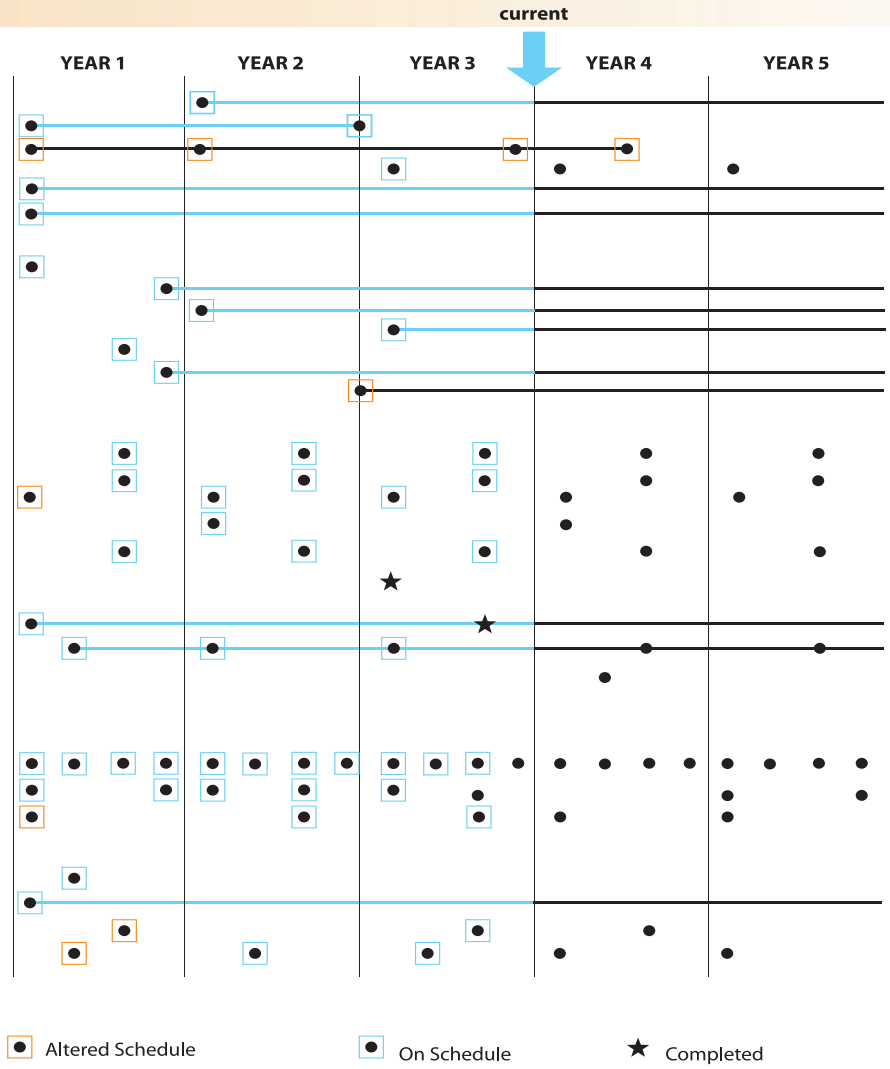
Cyberinfrastructure
Define internal data storage standards
Establish core data ingest services
Establish core data delivery services (OGC WxS)
Establish data delivery SOAP services
Establish portal framework
Publish content into portal
Develop analytic and visualization service for portal

Education
Summer Institute for Teacher Professional Development
Undergraduate Research Opportunities Program
Climate change course/workshops
Graduate Summer School in Regional Climate Modeling
Junior Faculty Leadership Training
Hold NSF Day

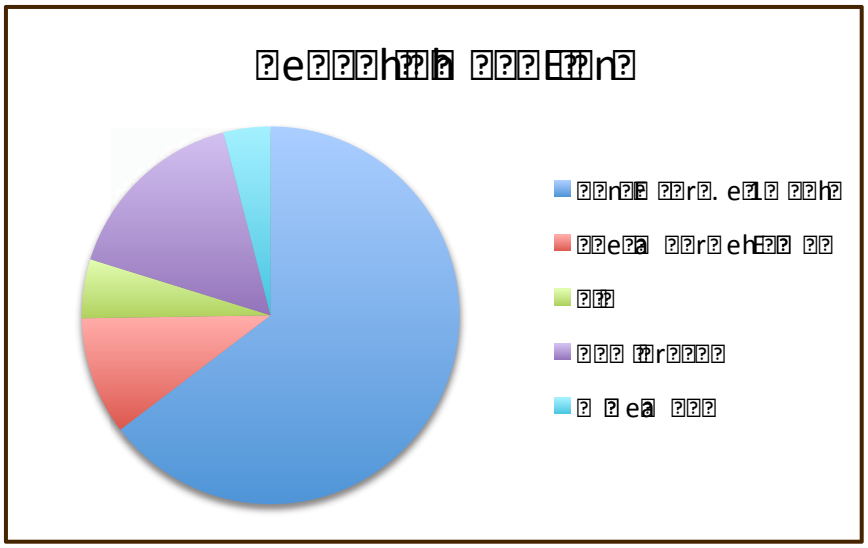
Public Outreach and Communication
Develop climate change exhibit
Public outreach activities
Town Hall Meeting

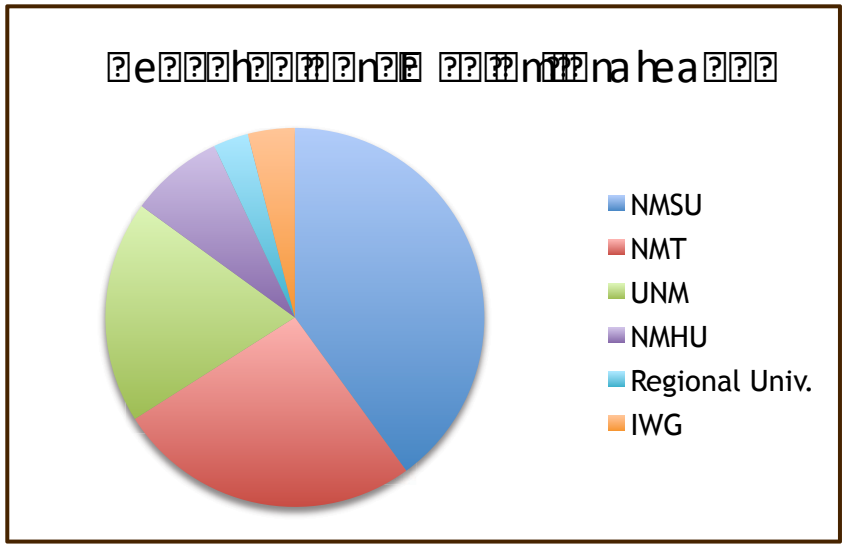
Management
Management Team meetings
State EPSCoR Committee
CUP meeting

Evaluation and Assessment
Baseline assessment of public perception (Korn&Assoc.)
Independent E&A (Minninck&Assoc.)
AAAS review
External Advisory Committee



Allocation of Financial Resources





Results of NSF and EAB/AAAS Reviews

- NM EPSCoR has done well so far! But…
- Where are the data?
- Where are the publications?
  - Reminder: Next IWG proposal deadline is December 1, 2011
- NSF Highlights
  - Communicate the impacts/outcomes of your work to a wide audience—think visuals!
- Burn rate
  - All equipment should be purchased in year 4
  - Plans for any carry-over funds from previous year(s) should be in current year budget--in alignment with Statement of Work

Thank you!