



New Mexico  
**EPSCoR**



# New Mexico EPSCoR

## NSF RII4 Planning

21 November 2011

*New Mexico Nexus of Energy, Water  
and Environment (NM-NEWE)*

2013-2018

# Welcome and introductions

- Name
- Institution
- Focus
  - K-12 Education
  - Undergraduate/graduate Education
  - Outreach
  - Workforce Development Focus



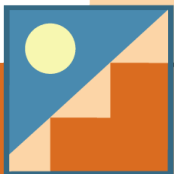
# Agenda

- 10 am - Welcome and review of proposal development process (Bill Michener, NM EPSCoR State Director; Mary Jo Daniel, NM EPSCoR Associate Director)
  - Objectives
  - NSF NM EPSCoR and the current project
  - The energy-water-environment nexus
  - RII 4 planning process and timeline
- 10:50 am - Charge to breakouts
- 11:00 am - Breakout groups by focus area
- Noon - Lunch
- 12:30 pm - Breakout groups reconvene
- 2:15 pm - Plenary session to report on breakout group progress
- 2:50 - Next steps
- 3:00 pm - adjourn



# Objectives for Planning Meeting #3

- Identify education, outreach, and workforce development activities that connect to the proposed research foci, leverage relevant NM resources, and contribute to a successful NSF proposal.
- Identify individuals and organizations that can contribute to education, outreach, and workforce development efforts.



# NSF EPSCoR Program Definition

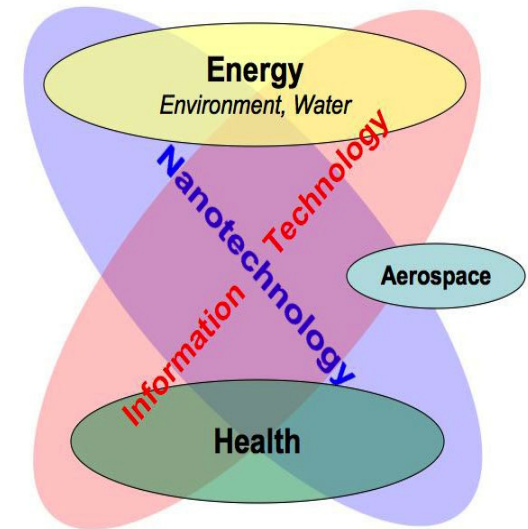
- Experimental Program to Stimulate Competitive Research
  - Track 1 - \$20M for 5 years (\$4M/yr); capacity building



# New Mexico State S&T Plan Core Areas

- Aerospace
- Bioscience
- Energy, Environment, and Water
- Information Technology
- Nanotechnology

Additional Focal Areas: Economic Development, Education, and Workforce Development



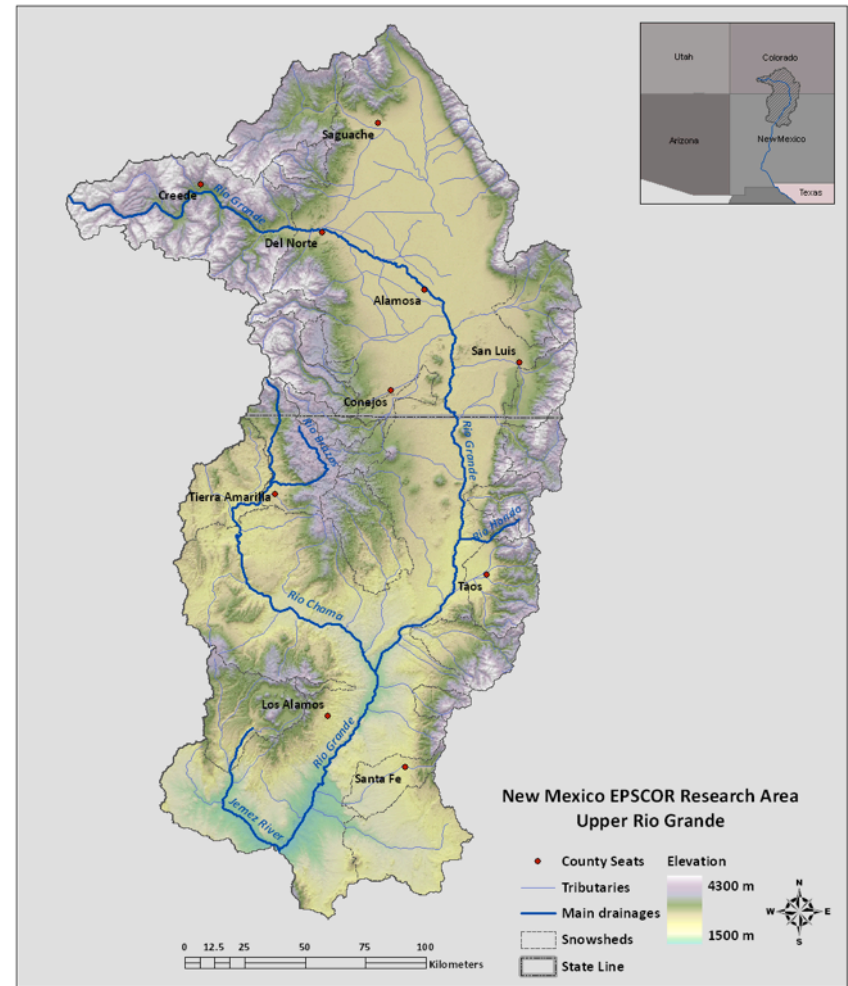
**Technology**21



Source: <http://www.edd.state.nm.us/scienceTechnology/intro/index.html>

# 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 for Current RII 3

## 1. Research Infrastructure:

- Climate and hydrology research infrastructure
- Water quality monitoring in high altitude stream environments
- Interdisciplinary socioeconomics and acequia research capacity
- Critical gap infrastructure for New Mexico Highlands University
- Innovation Working Groups (IWG)
- Critical Infrastructure Gap Seed Awards

## 2. Cyberinfrastructure:

- Scientific data and model output generation, management, discovery, and use





# RII 3 Strategic Plan, cont.

- 3. Human Infrastructure
  - Enhance diversity in all elements of the EPSCoR Program
  - Provide STEM teacher professional development in northern New Mexico
  - Increase the exposure of students at non-PhD granting institutions to high quality, relevant, hypothesis-driven research
  - Provide graduate research training opportunities
  - Inform faculty about funding opportunities via NSF Days
  - Enhance faculty leadership skills for faculty via a Faculty Leadership Workshop Program
  - Create a citizenry that is informed about climate change and its impact on NM's natural resources via public outreach and communication



# RII4 Planning

- Energy-water-environment nexus
- The planning process

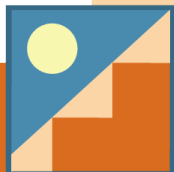
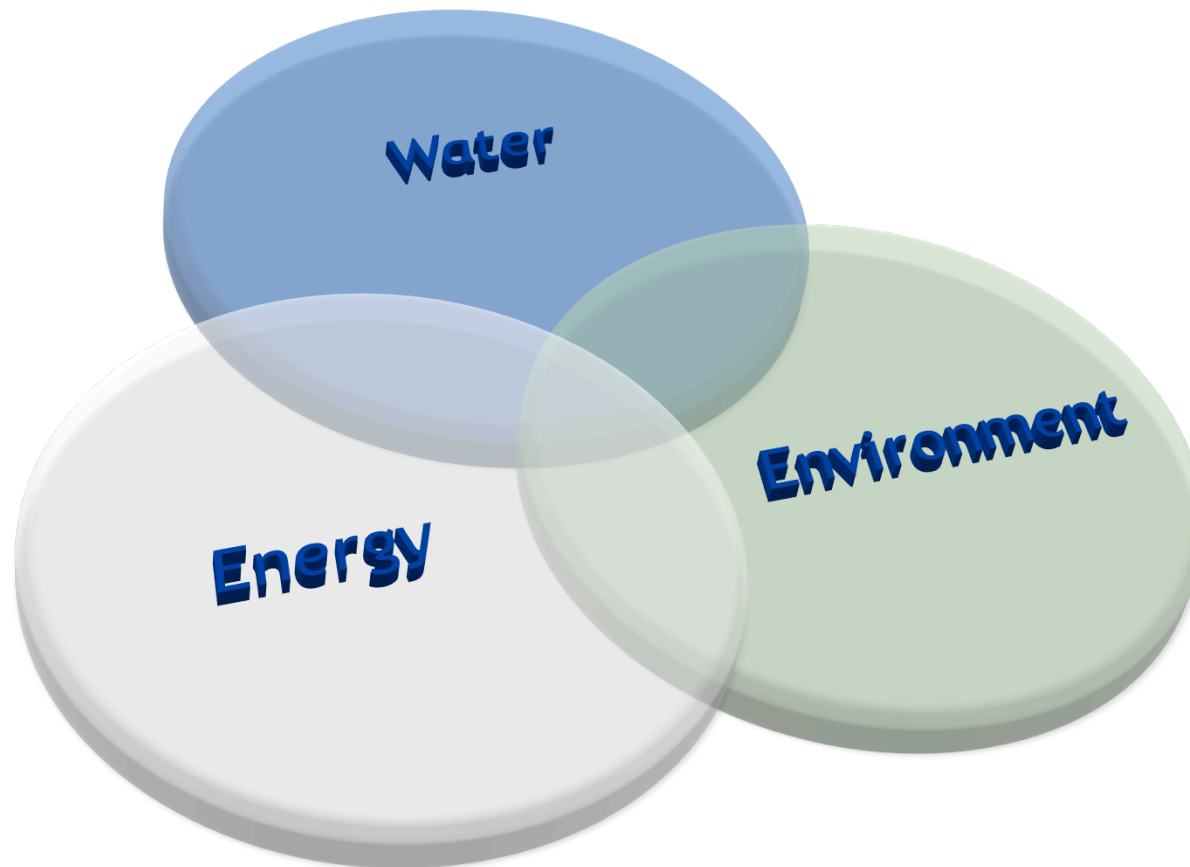


# EPSCoR RII4 Proposal

- Research: Energy, Water, Environment Nexus
  - SEC decision following AAAS recommendations:
    - Builds on current project (RII 3)
    - Increased focus on building capacity of regional and tribal colleges
    - Strongly integrative cyberinfrastructure component
    - Extend and expand current efforts on building STEM pipeline
    - New and related workforce development activities



# S&T Plan: Energy-water-environment nexus



# S&T Plan: Energy, Water, Environment

- Energy
  - Oil and gas; renewable energy sources such as biofuels, wind, solar; hydrogen; fuel cells; conservation; clean coal; etc.
- Water
  - Hydrology; sensors; modeling; watershed and aquifer sustainability; groundwater issues; conservation; water quality; desalination; use of brackish and produced water, etc.
- Environment
  - Climate change; remote sensing; ecosystem modeling; impact of forest thinning; atmospheric modeling; soil, air, air and water remediation; etc.
- Socioeconomic
  - Choice; cost trade-offs; individual based modeling; scenario-building and forecasting; etc.



# Energy as a growth area in New Mexico



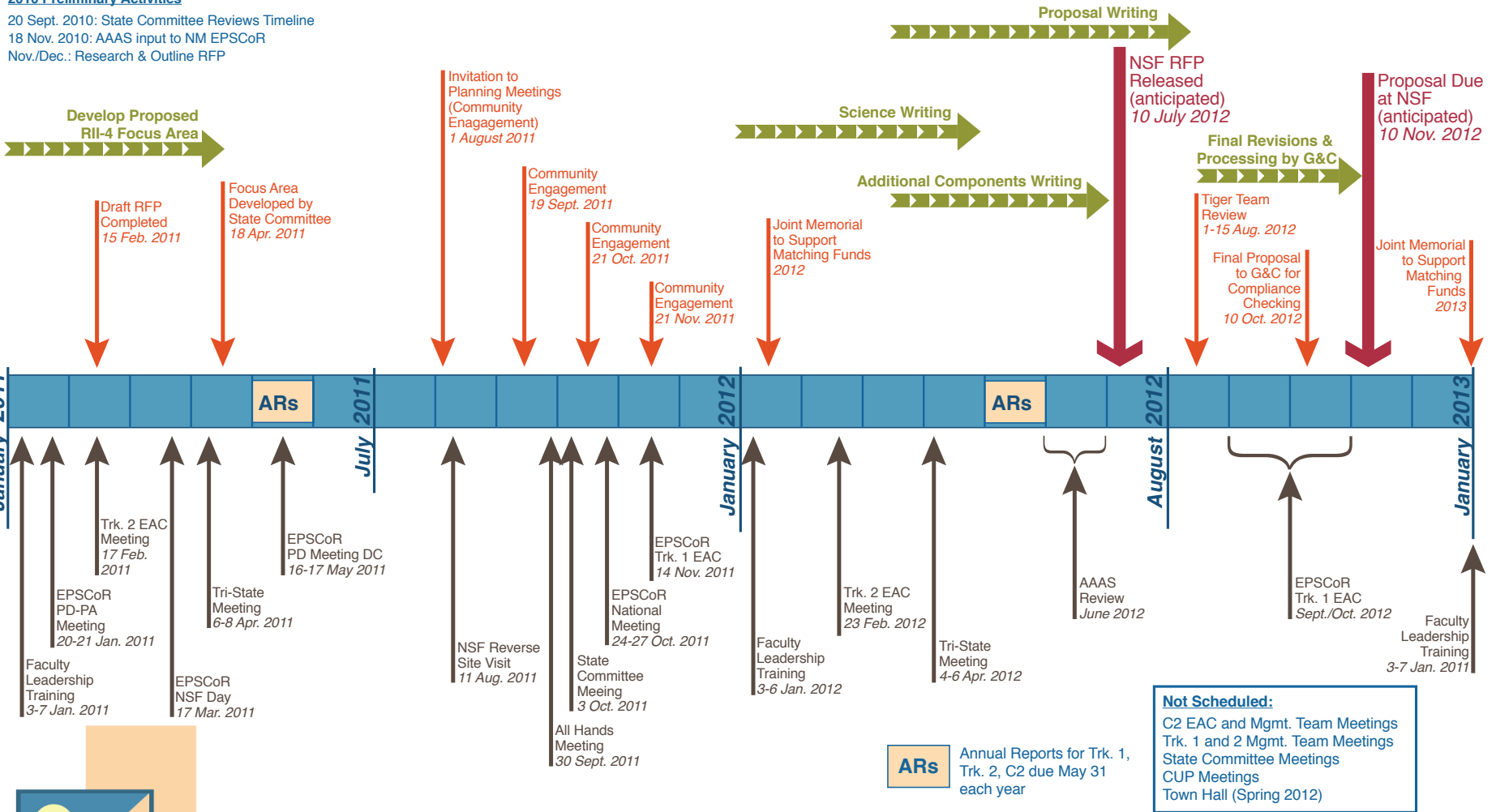
# EPSCoR RII Track 1 Critical Milestones

Climate Change Impacts on New Mexico's Mountain Sources of Water

DRAFT #4: JUNE 24, 2011

## 2010 Preliminary Activities

20 Sept. 2010: State Committee Reviews Timeline  
18 Nov. 2010: AAAS input to NM EPSCoR  
Nov./Dec.: Research & Outline RFP



# The Planning Process

- Fall 2011 - Stakeholder planning meetings
  - ✓ Sept 19 - science questions to be addressed
  - ✓ Oct 21 - research infrastructure and CI
    - Nov 21 - education, outreach, and workforce development
- Dec 2011 - Establish Proposal Steering Committee
- Jan - July 2012 - Proposal writing and additional workshops
- June 2012 - AAAS Review
- July 2012 - NSF RFP Released (tentative)
- July 2012 - Revisions to proposal based on AAAS Review and RFP
- Aug 2012 - External Review by Tiger Team
- Aug - Sept 2012 - Final revisions, budgeting, and processing
- Oct 2012 - Proposal to G&C for compliance checking
- November 2012 - submit proposal





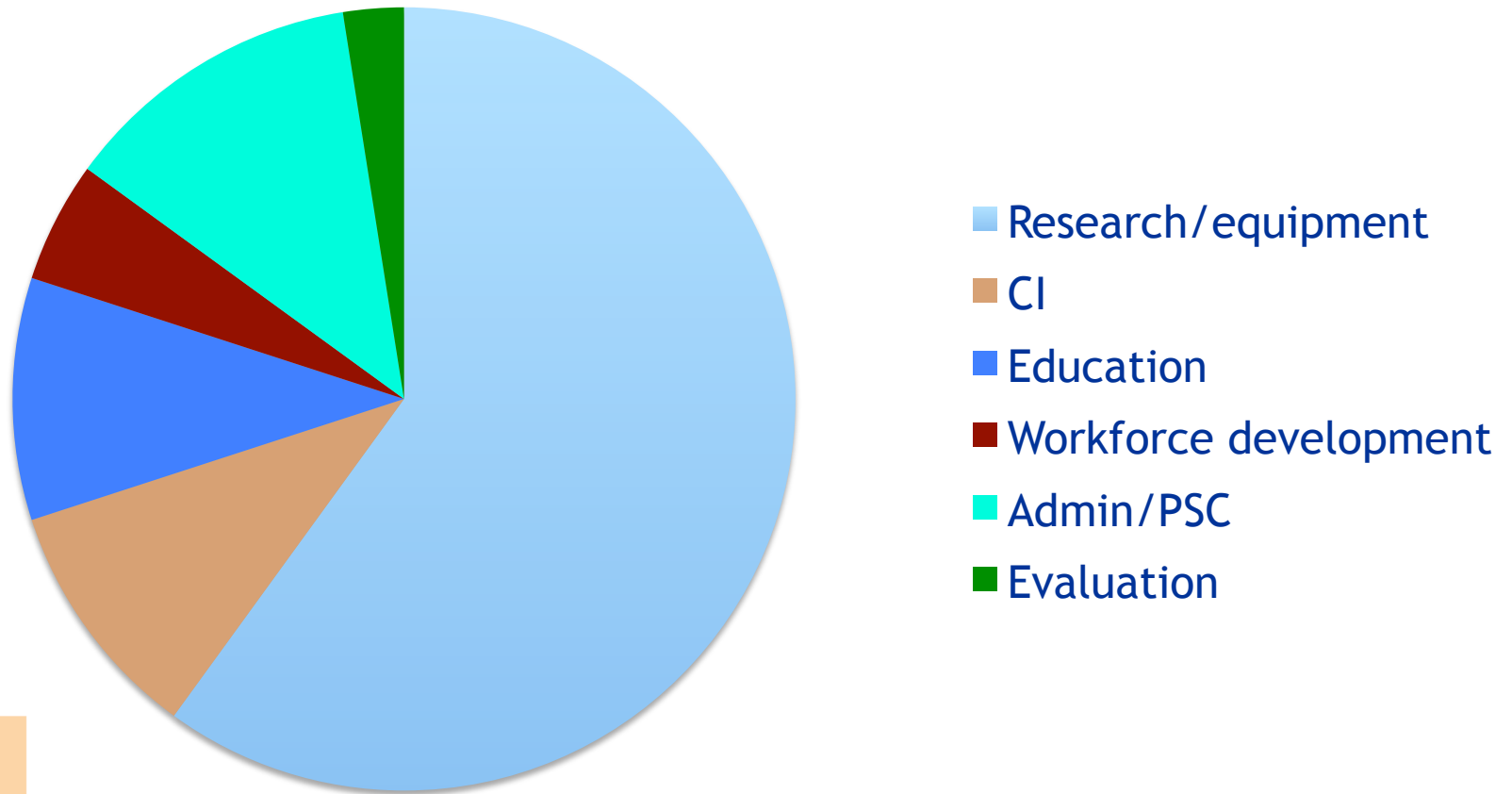
# The Proposal Steering Committee

- 12 members +/-
- Expertise
  - Subject area expertise
    - research, CI, education, outreach, workforce development
  - Writing talent and organizational abilities
- Diversity
  - Institutional
    - Major research universities
    - Regional universities and colleges
    - National labs
    - ....
  - Gender, racial, and ethnic diversity



# Funding scenario (\$20-24M)

## EPSCoR Budget



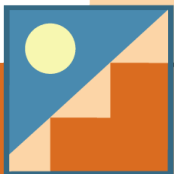
## 20% match (\$4M)

1. Many states receive a state appropriation for the entire cost-share requirement and it is written into legislation.
2. \$ contributions from industry and business.
3. Salary and wages and FB for any EPSCoR staff that are supported.
4. Reduced IDC rates.
5. University and foundation contributions to picking up RAs, GRAs, Post-docs
6. University cost-share on faculty start-up packages.
7. Contributions of equipment.
8. Faculty release time.



# Energy-Water-Environment Focal Areas

- Solar
  - Mike Heagy (NMT)
- Geothermal Resources
  - Mike Person (NMT)
- Produced Waters in Oil and Gas Exploration
  - Frank Huang and Jan Hendrickx (NMT)
- Sustainability
  - Janie Chermak and Bruce Thompson (UNM); Sam Fernald (NMSU)
- Algal Biofuels
  - Peter Lammers (NMSU)
- Uranium
  - Dana Ulmer-Scholle (NMT)



# Current Education/Outreach Activities

- K-12
  - Summer Teacher Institute; field trips/follow-up
  - Sandia Mountain Natural History Center
  - Supercomputing Challenge and GUTS
  - K-12 Cyberlearning Summit (Jan. 2012)
  - Environmental Education Summit (Golden Apple)
  - Project WET workshops (EEANM)
  - Water Books for early elementary (Earth's Birthday Project)
  - Teacher Advisory for Data Portal Use



# Current Education/Outreach Activities, cont.

- Undergraduate
  - Undergraduate Research Opportunity Project (UROP)
- Graduate
  - Interdisciplinary Modeling Course (with NV and ID)
  - Graduate Training (Parallel Programming, etc.)
- Faculty
  - Junior Faculty Leadership Workshop
  - Using CI for Education (UCIE)
  - NSF Day
  - Communicating Science Workshop



# Current Education/Outreach Activities, cont.

- Public Outreach
  - Exhibit and events at NM Museum of Natural History and Science
  - Fast Forward NM computer training
  - Math and Science Day at the Legislature
  - Town Hall/Forum “Water and the NM Economy”-spring 2012



# Q&A

- Process
- EPSCoR in general
- etc.





# Charge to Breakouts

- Identify and propose K-12 and higher education, outreach, and workforce development activities that connect to the proposed research foci, leverage relevant NM resources, and will contribute to a successful NSF proposal.
- Identify other individuals and organizations not present that can contribute to education, outreach, and workforce development efforts.



# Criteria for Prioritization

1. How innovative and potentially transformative is the activity?
2. Are there existing programs that can be leveraged?
3. How well does the activity relate to the energy-water-environment nexus?
4. How well does the activity focus on secondary school teachers and minority-serving two-year and four-year institutions?
5. Does the activity contribute to the development of a diverse, well-prepared, internationally competent, and globally engaged STEM workforce and a more scientifically literate public?



# 11:00 - Breakouts by focus areas



12:00 - Lunch



12:30 - Breakouts reconvene



# 2:15 - Reports from Breakouts



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## 2:50 - Next steps

- ✓ Science white papers
- ✓ Fall 2011 - Stakeholder planning meetings
  - ✓ Sept 19 - research foci
  - ✓ Oct 21 - research infrastructure and CI
  - ✓ Nov 21 - education, outreach, and workforce development
- Dec. 15, 2011- White Paper due
- Jan 2012 - Establish Proposal Steering Committee
- Jan - July 2012 - Proposal writing and additional workshops



# Education, Outreach, WFD White Paper

- Title
- Author(s) and Affiliations
- Description of Activity (1-2 paragraphs)
- Relevance to Energy-Water-Environment Nexus
- Target Audience
  - K-12
  - Undergrad/grad
  - Outreach
  - Workforce Development
- Due to [mjdaniel@unm.edu](mailto:mjdaniel@unm.edu) on December 15, 2011





# Thank you!

