

Project Overview

Project Director
Gayle Dana (DRI)

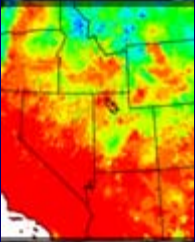
Principal Investigators
Nick Lancaster (DRI)
Scott Mensing (UNR)
Tom Piechota (UNLV)

ERTAB Meeting
February 5 2009



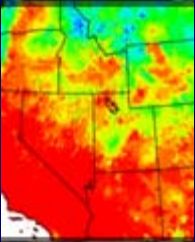
Vision

- *Create a statewide interdisciplinary program and virtual climate change center to....*
- *Stimulate transformative research, education, and outreach on the effects of regional climate change on ecosystem services (especially water resources) and....*
- *Support use of this knowledge by policy makers and stakeholders*



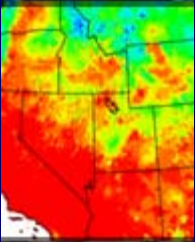
Major Outcome

- New interdisciplinary capability to detect, analyze, and model effects of regional climate change on landscapes, ecosystems, and water resources and communicate research results to decision makers and the public



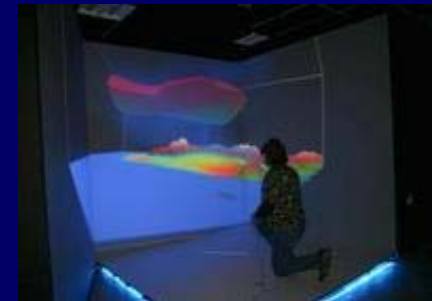
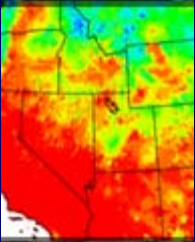
Legacies (Infrastructure Building)

- Regional climate modeling capability
- Observational Network for Ecohydrology
- Climate Change Data Portal
- Enhanced Computational Capabilities (e.g., clusters, visualization)
- New faculty
- Graduate students
- Enhanced educational opportunities at all levels
- Greater public awareness of climate change issues



Project Basics

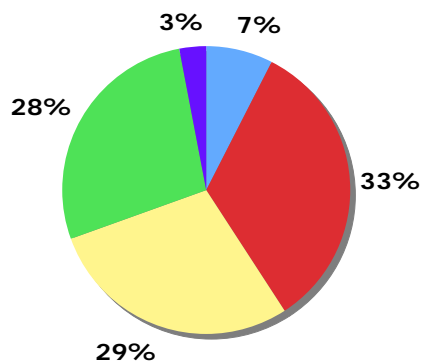
- 5 years (Sept 2008 to Aug 2013)
- NSF: \$15,000,000 (\$3,000,000/year)
- NSHE EPSCOR: \$6,500,000
- NSHE Institutions
 - University of Nevada, Reno
 - University of Nevada, Las Vegas
 - Desert Research Institute
 - Nevada State College



Budget breakdown

Federal

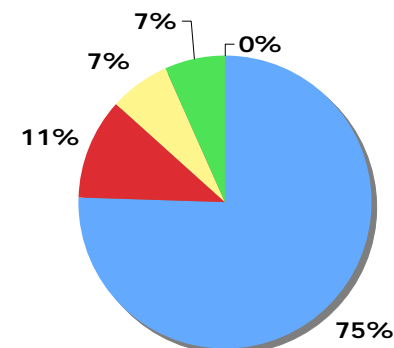
Federal: \$14,958,808



■ NSHE ■ DRI ■ UNLV ■ UNR ■ NSC

State

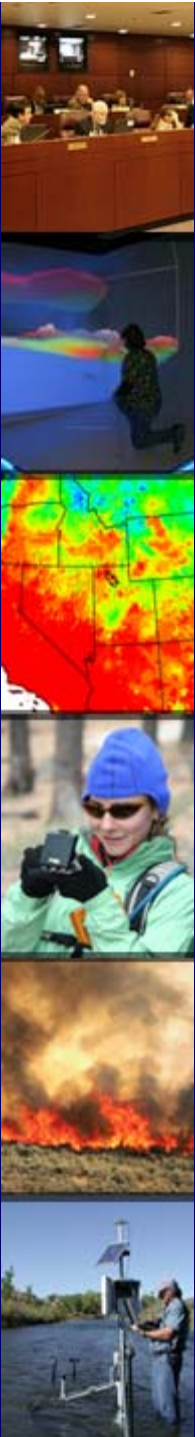
State: \$6,597,700

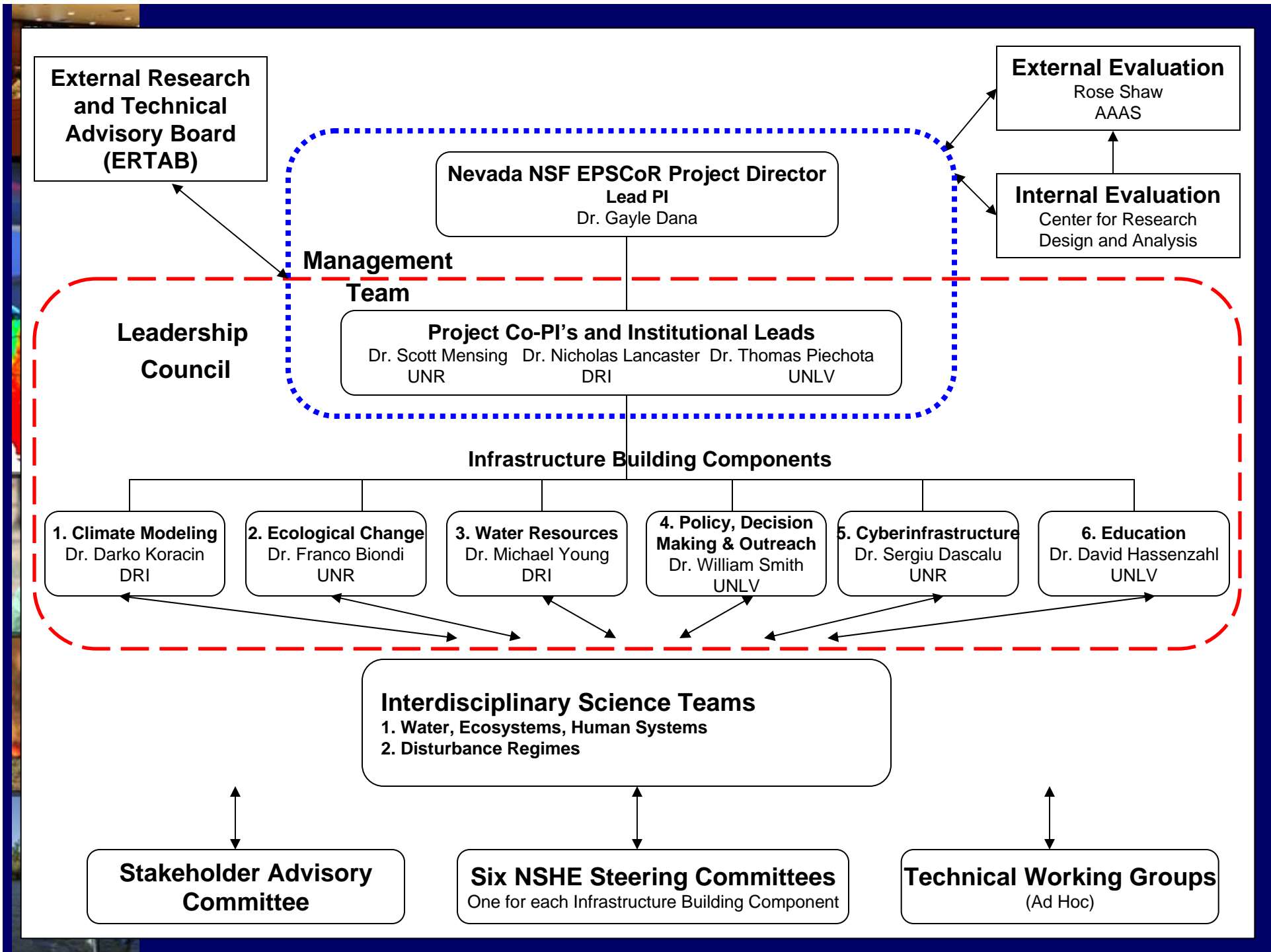


■ NSHE ■ DRI ■ UNLV ■ UNR ■ NSC

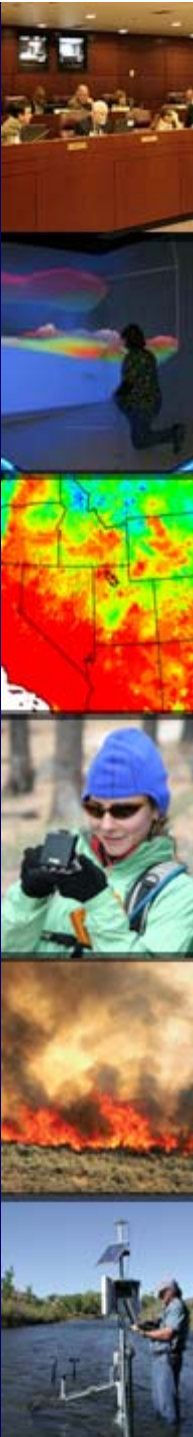
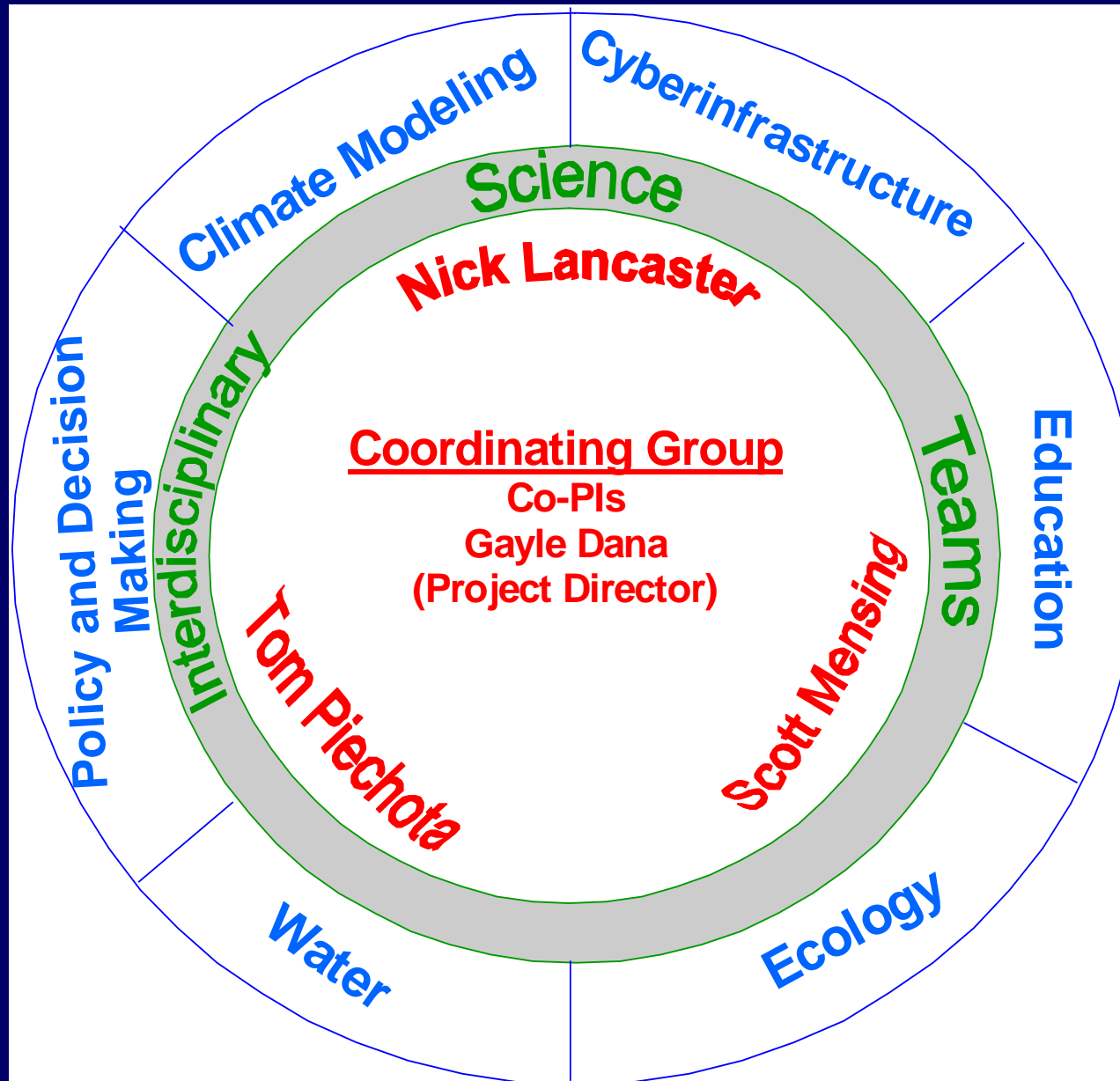
Funding driven by science needs
Distribution - parity between 3 major campuses

Support for administration of project, interdisciplinary science teams, and education (e.g graduate student support)





Project Science Structure



Steering Committees

• Climate Modeling

- Darko Koracin, DRI
- Scott Bassett, UNR
- Zhongbo Yu, UNLV

• Education

- David Hassenzahl, UNLV
- Michael Collopy, UNR
- Saiid Saiidi, UNR
- John Farley, UNLV
- Paul Buck, CSN

• Cyberinfrastructure

- Sergiu Dascalu – UNR
- Shahram Latifi – UNLV
- [Fred Harris?] – DRI

• Water

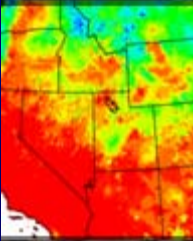
- Michael Young, DRI
- Dale Devitt, UNLV
- Laurel Saito, UNR

• Ecology

- Franco Biondi, UNR
- John (“Jay”) Arnone, DRI
- Brett Riddle, UNLV

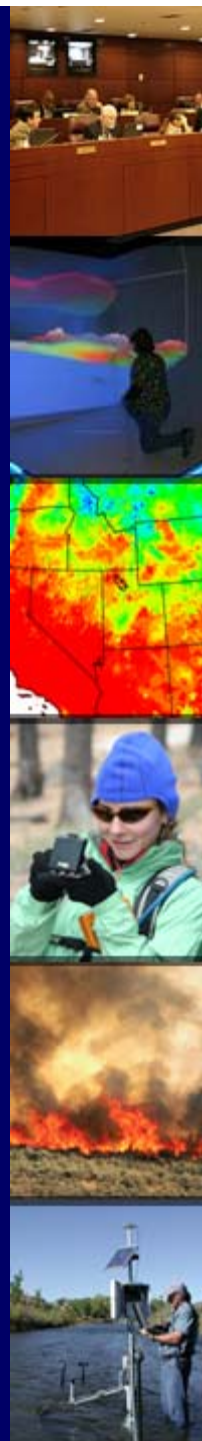
• Policy and Decision Making

- William James Smith, Jr., UNLV
- Asako Stone, DRI
- Derek Kauneckis, UNR



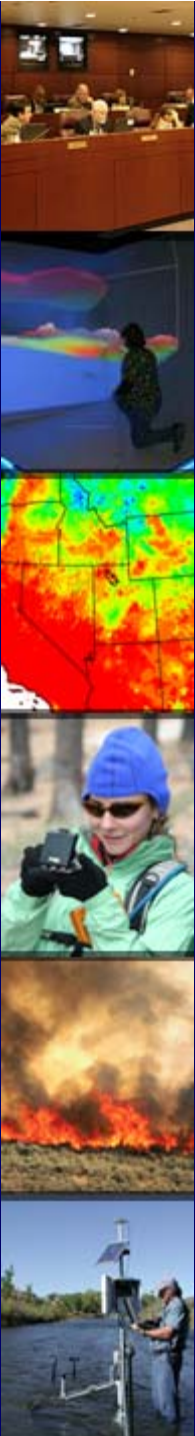
Climate Modeling Component

- *Develop a capability to model climate change at a regional and sub-regional scale and its effects on ecosystems and water resources*
- Key elements
 - Downscaling of global climate model data
 - Coupling of climate and hydrologic, ecologic, and land use models
 - Integration with other components
 - Water Resources
 - Ecological Change



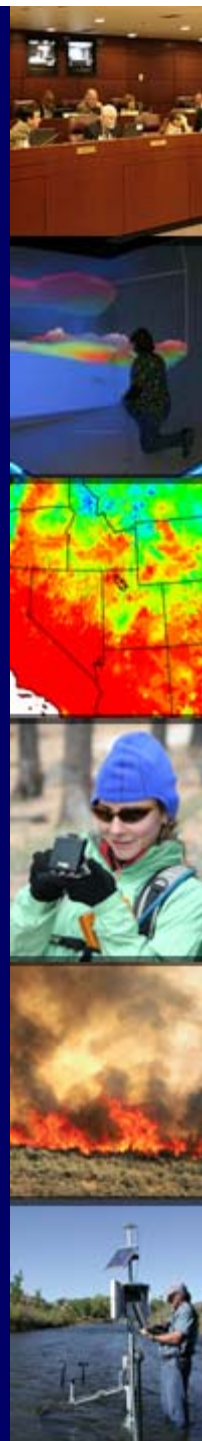
Ecological Change Component

- *Develop data collection, modeling, and visualization infrastructure to determine and analyze effects of climate change on ecosystems and disturbance regimes*
- Key elements
 - Use of transect data to understand processes controlling impacts of climate on species dynamics and disturbance regimes
 - Numerical models to evaluate interactions between landscape-level processes and biophysical indicators and predict future changes in wildfire regime, primary productivity, biodiversity

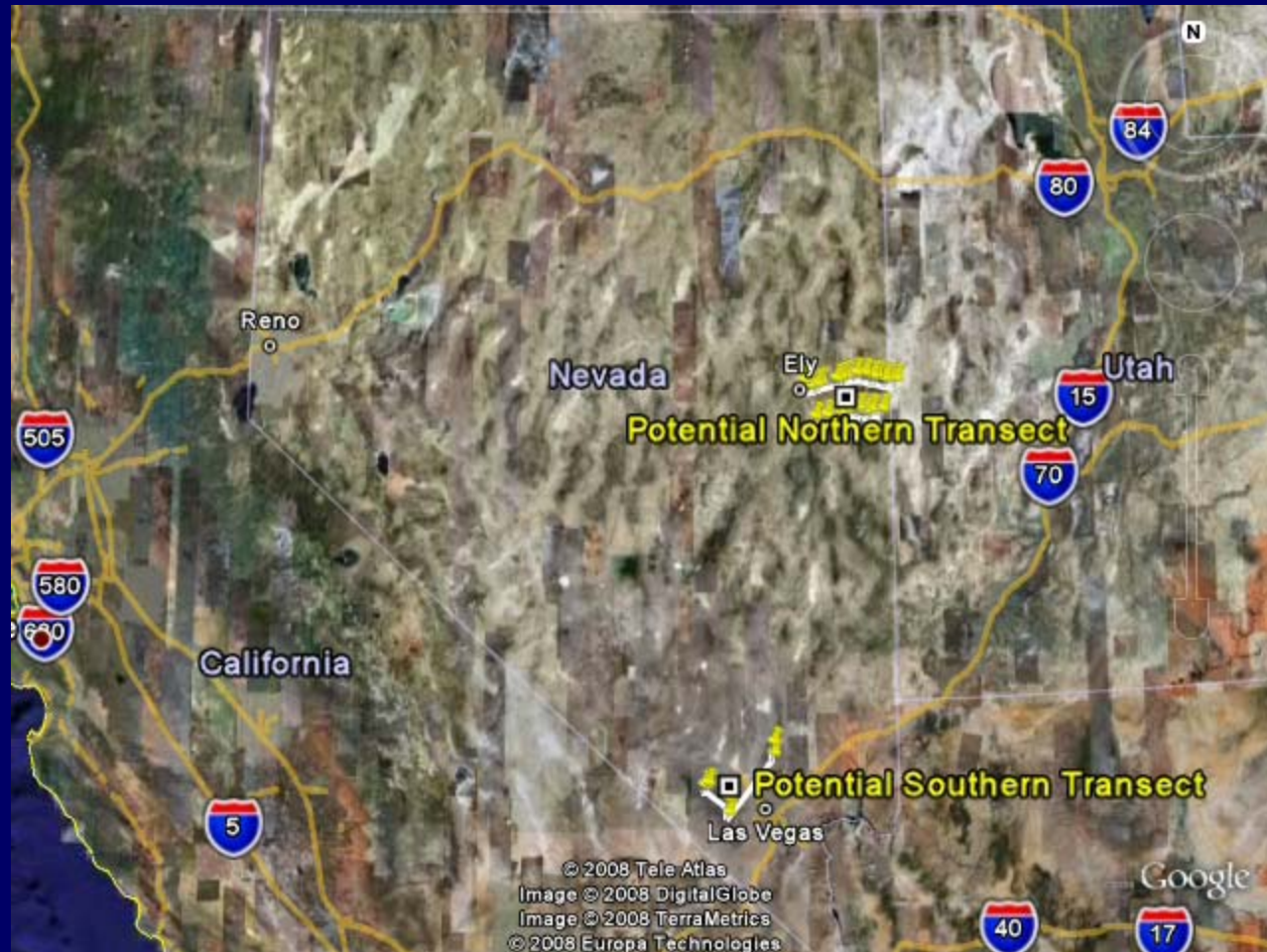
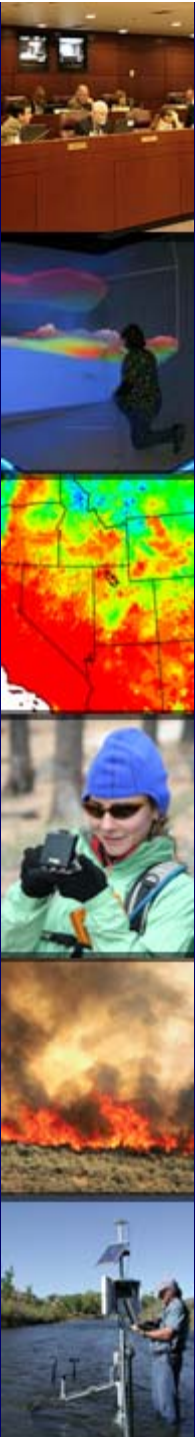


Water Resources Component

- *Develop data collection, modeling, and visualization infrastructure to better quantify and model changes in water balance and supply under climate change*
- Key elements
 - Instrumented transects spanning a range of elevations at two locations in Nevada
 - Numerical models to evaluate interactions between surface and groundwater systems under climate change and/or climate variability scenarios and predict future state of water resources

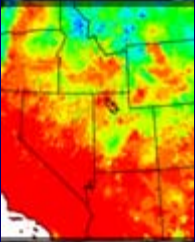


Environmental Transects



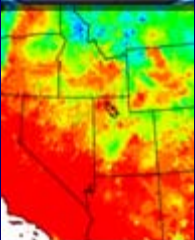
Objectives of observational transects

- Quantify the effects of climate change and variability on hydrologic inputs and the ecologically modulated distribution of this water
- Quantify ecological responses of system components to climate change and variability to determine/define ecosystem hydrologic behavior (e.g. bio-availability of water)
- Assess how effects and responses may differ between elevational transects located at different latitudes within the State

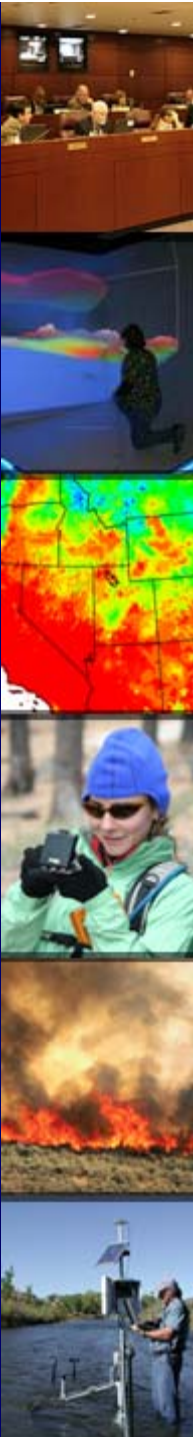
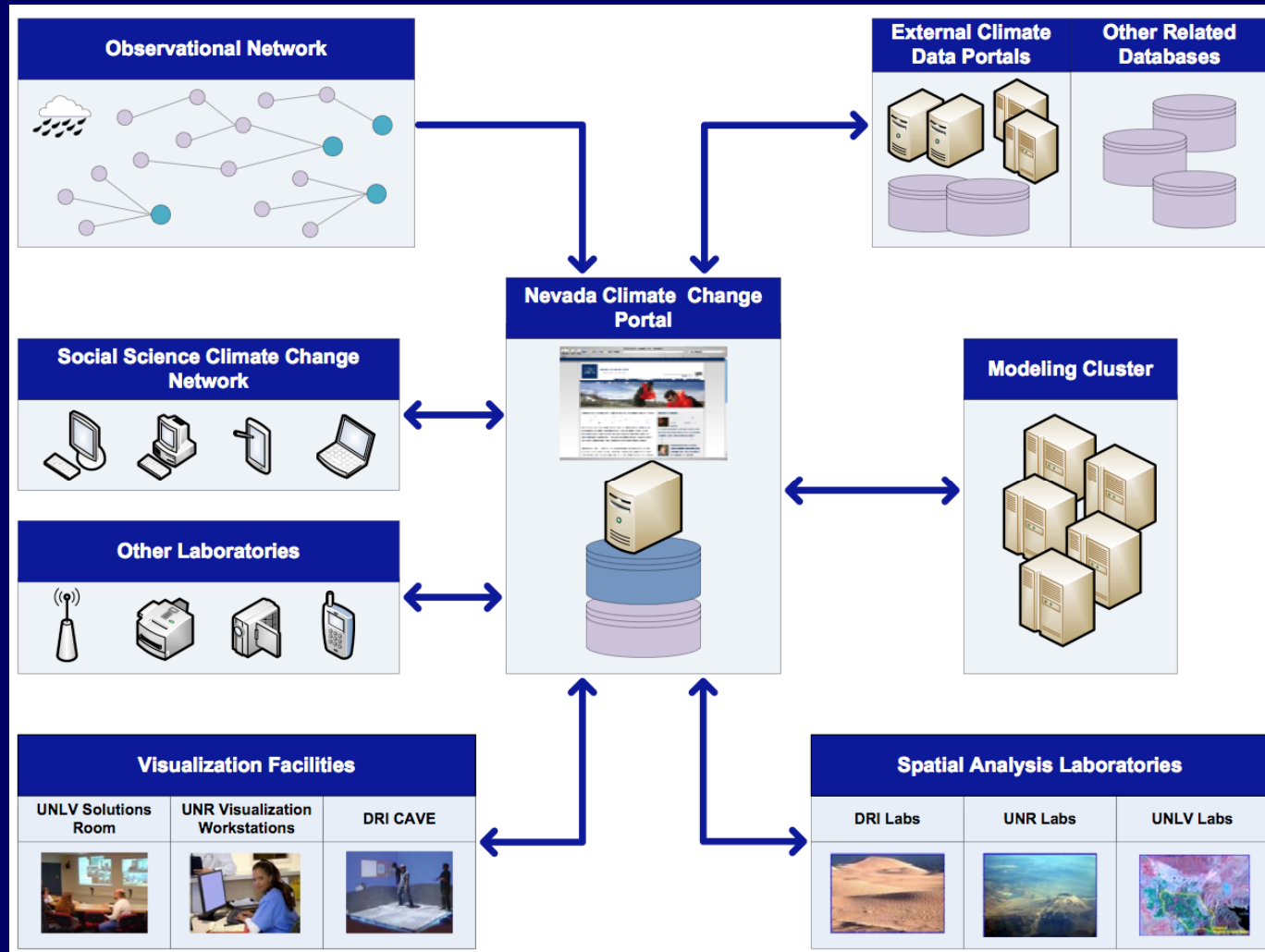


Cyberinfrastructure Component

- *Facilitate and support interdisciplinary climate change research, policy, decision-making, outreach and education by using cyberinfrastructure to develop and make available integrated data repositories and intelligent, user-friendly software solutions*
- Key elements
 - Nevada Climate Change data portal
 - Intelligent interactive software tools that support research, applications, and education in climate change
 - Visualization facilities that enable data communication and sharing

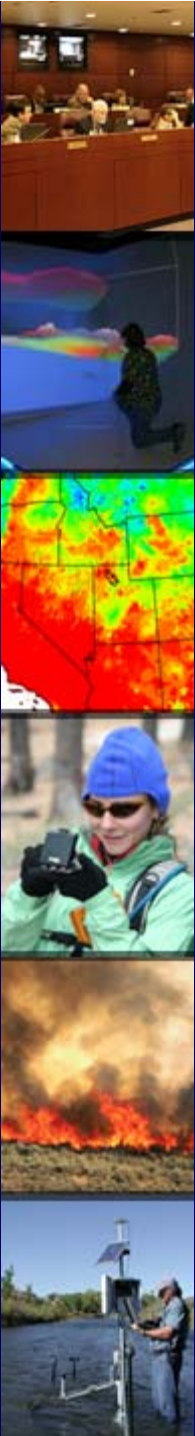


Cyberinfrastructure Component



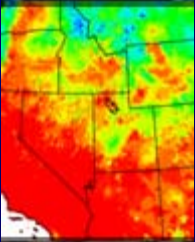
Policy, Decision Making, and Outreach Component

- *Document, Interpret, and communicate institutional and societal impacts of climate change research findings to all interested and affected parties*
- Key elements
 - Data collection that is synergistic with biophysical monitoring
 - Visualization of functional multidisciplinary spatial data to inform behavior and policy
 - Improved science communication regarding alternative scenarios modeled, and scientist's understanding of audience perceptions and needs
 - Integration of local & 'scientific' knowledge to enhance community resilience to climate change



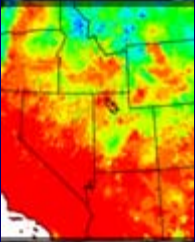
Education Component

- *Create a scholarly environment to promote research skills and intellectual development for Nevada educators and students*
- Major areas of emphasis
 - K-12 – focus on Middle Schools
 - Undergraduates – scholarships; minor in climate change
 - Graduate students – Component GRA's; Fellowships; certificate in climate change
 - Curriculum development – new courses, statewide conference



Integrative activities: Outreach

- Ongoing activities
 - Stakeholder Advisory Committee
 - Nevada Small Business Development Center
 - Video on climate change / project web site
 - Presentations to agencies
- Conferences
 - State / Inter-jurisdictional / National
 - Stakeholder Outreach
- Diversity
 - Minority faculty startup funds
 - Mentoring – High School / Community College / Univ.



Integration: Interdisciplinary Science Teams

- Integrate components via overarching interdisciplinary science questions
 - How will climate change affect water resources and linked ecosystem services and human systems?
 - How will climate change affect disturbance regimes (e.g., wildland fires, invasive species, insect outbreaks, droughts) and linked systems?
- Two teams, two years duration, \$150k/team/year
 - Must utilize new infrastructure developed
 - Address cross-cutting issues related to the interdisciplinary science questions
 - Involve faculty and students from at least two institutions (DRI, UNLV, and UNR), as well as community colleges

