

**CEMP**

*Community Environmental Monitoring Program*

<http://cemp.dri.edu/cemp/>

**WELCOME**

**Community Environmental Monitoring Program  
(CEMP)  
Annual Workshop**





50 Years of Environmental Research

## DRI Overview

Stephen G. Wells, President

**Nevada Legislature created a division within the system of higher education devoted to research and mandated to:**

- Promote general welfare of State of NV and its citizens
- Conduct and promote fundamental & applied research
- Encourage faculty and student research
- Acquire and disseminate knowledge

# 50 years of history in Science, Engineering & Technology



1960: \$2.5M

2008: ~ \$60M



Solar energy



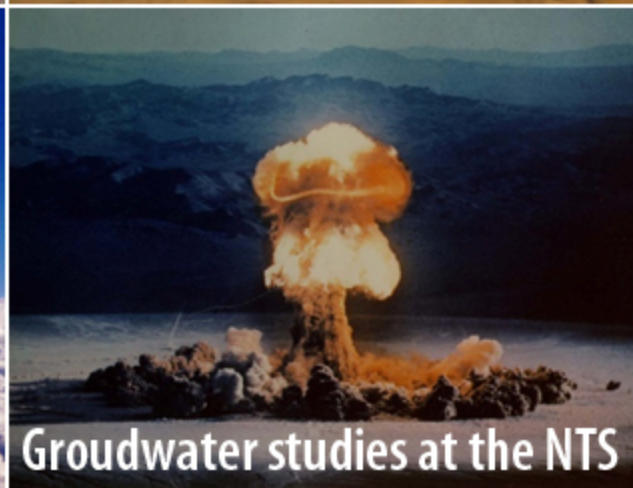
Namibia, Africa



Xian, China



Cloud seeding



Groudwater studies at the NTS



Greenland



## A History of DRI Spin-off Programs



Fleischmann Planetarium



Museum of Natural History

- DRI designed and built the Fleischmann Atmospherium Planetarium, operating it until 1975 when it was turned over to UNR.
- Basque studies by Dr. Douglass assimilated into UNR's Basque Studies Program.
- DRI's medical research lab (Lab of Environmental Patho-Physiology) ultimately becomes the University's Medical School.
- Museum of Natural History transferred to UNLV in 1972.

# Overview of Nevada System of Higher Education (NSHE)



**Board of Regents**

**Chancellor**

**System Office**

**Universities**

UNLV  
UNR

**Community  
Colleges**

CSN  
GBC  
TMCC  
WNC

**State  
College**

Nevada  
State  
College

**Research  
Institute**

**DRI**

# Overview

Science  Environment  Solutions

**Vision:** Scientific & engineering leader investigating . . . natural and human-induced environmental change . . . and advancing environmental technologies.

**Mission:** Excellence in environmental research and application of technologies. . . to improve people's lives throughout Nevada and the world.



# DRI at a Glance: 2008

- 500 employees with 180 research faculty
- Non-tenure / soft-money structure:
  - Faculty are not tenured and **generate own salaries** (no state-funded positions)
  - Faculty bring ~\$40M into Nevada's economy!
- At any given time, DRI conducts about 300 research projects worldwide
- Over 60 specialized labs & research facilities, including:
  - Renewable Energy Center
  - Ultra-Trace Chemistry Lab
  - Environmental Analysis Facility
  - Center for Advanced Computation/Visualization
  - Ecologically Controlled Enclosed Lysimeter Labs
- Research to improve people's lives: Nevada & world



# DRI's Research Campuses and Facilities

- Today, DRI has two primary campuses:
  - Reno
  - Las Vegas
- with research facilities in:
  - Boulder City
  - SNC, Incline Village
  - Steamboat Springs, CO
  - Stead



# Research Structure

## Research Divisions:

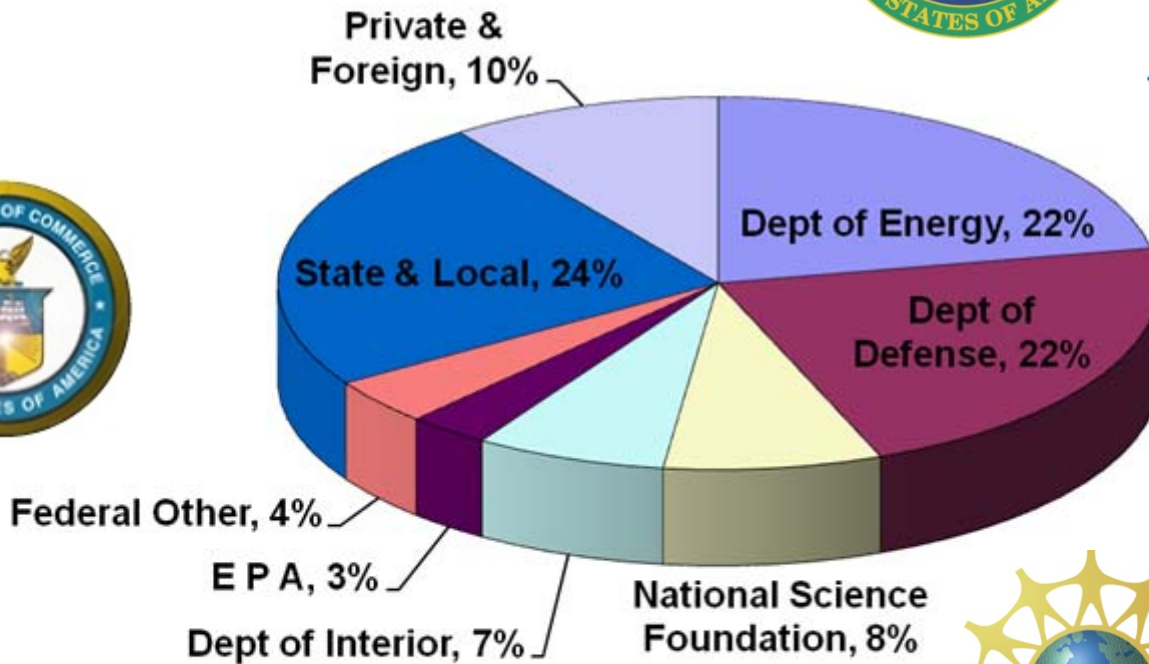
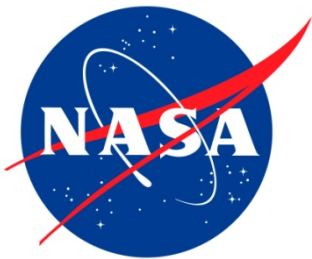
- Atmospheric Sciences
- Earth and Ecosystem Sciences
- Hydrologic Sciences

## Integrated Science Centers:

- Rogers Center for Environmental Remediation and Monitoring (CERM)
- Watersheds and Environmental Sustainability (CWES) Center for Advanced Visualization, Computation, and Modeling (CAVCaM)
- Center for Advanced Visualization, Computation, and Modeling (CAVCaM)
- Arid Lands Environmental Management (CALEM)



# FY2008 DRI Sponsored Project Actual Expenditures by Major Sponsor \$37.4 Million





# DRI's Competitiveness

## Academic Institutional Rankings

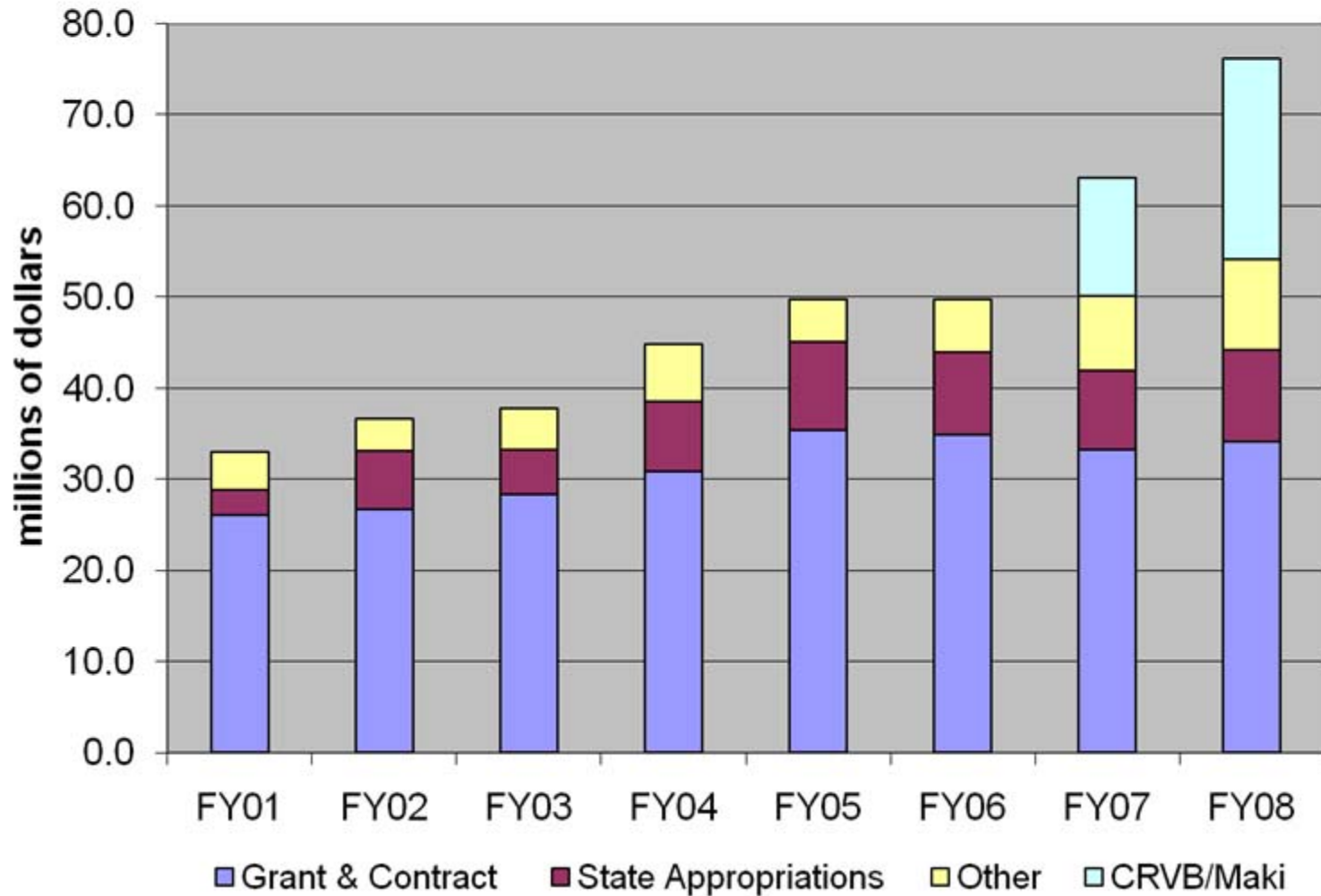
### National Science Foundation

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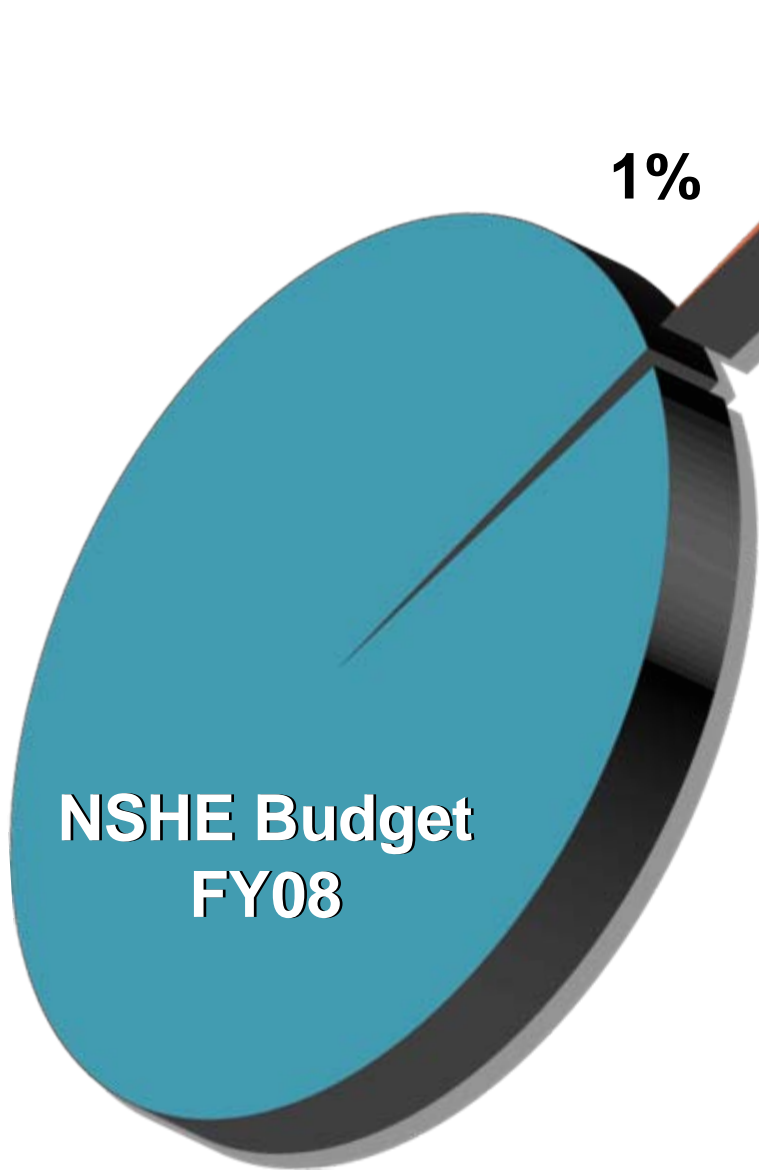
Ranking by R&D expenditures in the environmental sciences at universities & colleges (*NSF Statistics, FY 2007*)

- 1 UC-San Diego
- 2 Woods Hole Oceanographic Institute
- 16 Johns Hopkins University
- 17 U. of Maryland Ctr. for Environmental Sciences
- 18 U. of Texas, Austin
- 19 **DRI**
- 28 Harvard
- 29 UC-Davis
- 37 Stanford
- 38 USC
- 39 University of Nevada, Las Vegas

# DRI's Growth: Revenue & Intellectual Capacity



# Economic Leveraging



- DRI's total revenue exceeds \$50 million, yet DRI accounts for only 1% of higher education's budget
- 1999-2007, DRI has leveraged \$60M in State funding to attract \$227M in external research

# Research Benefiting Nevada



Groundwater testing



- DRI's groundwater flow model approved for use at the Shoal underground nuclear test site near Fallon, Nevada.
- Community Environmental Monitoring Program monitors for radiation in the region surrounding the Nevada Test Site.

**C**ommunity  
**E**nvironmental  
**M**onitoring  
**P**rogram





# Research Benefiting the Nation



- DRI's Western Regional Climate Center contracted by FEMA in the aftermath of the World Trade Center attacks on 9/11
- DRI contacted to create a Web site providing public access to atmospheric conditions
- Web site up and operating within two days of initial request!





# Research Benefiting the World



Xian, China

- Impacts of air quality on China's national treasures with CAS IEE



West Africa

- West Africa Water Initiative with Hilton Foundation



# DRI's Value Added to Education

- **UNR:**
  - Atmospheric Sciences
  - Hydrologic Sciences
  - Other (anthropology, geology, biology, engineering, etc.)
- **UNLV:**
  - Water Resource Management
  - Other (anthropology, biology, chemistry, engineering, environmental studies, geology, etc.)
- **Nevada State College**
- Approximately 50 faculty teaching and advising students at present
- There are 60-75 students supported at DRI
- DRI invests ~ \$1.7 M/year (***non-State funds***) for support of grad students at UNLV and UNR

# Strategic Goals

- Serve as a world leader
- Foster scientific talent
- Establish active partnerships
- Provide quality opportunities for research educational experiences
- Leverage scientific innovation & intellectual capital
- Serve as a national & international model

USAID  
UNICEF  
LIONS CLUB INTL  
WATER AID  
DRI

## “Yerda wo ase!”

The children of West Africa  
and World Vision  
say “Thank You” to the  
Conrad N. Hilton Foundation.

Thank you, Conrad N. Hilton Foundation, for helping bring a legacy of life and health to West Africa. Your support has allowed World Vision to drill 1,200 freely-water wells in Ghana, West Africa, reducing waterborne diseases by more than 95 percent over the last decade. As a result, millions of children's lives have been saved.

But we're not stopping there. In 2000, 1.3 million children under five died because of unsafe water, inadequate sanitation and poor hygiene.

Today, World Vision and the Conrad N. Hilton Foundation are launching an unprecedented \$40 million West Africa Water Initiative. We're working in cooperation with USAID, UNICEF, Lions Club International, WaterAid, DRI, and other partners convened by the Hilton Foundation. Together, we will bring clean, disease-free water and sanitary facilities to children in rural villages in Ghana, Mali and Niger.

On behalf of millions of children and their families, thank you!



USA TODAY AUGUST 21, 2002

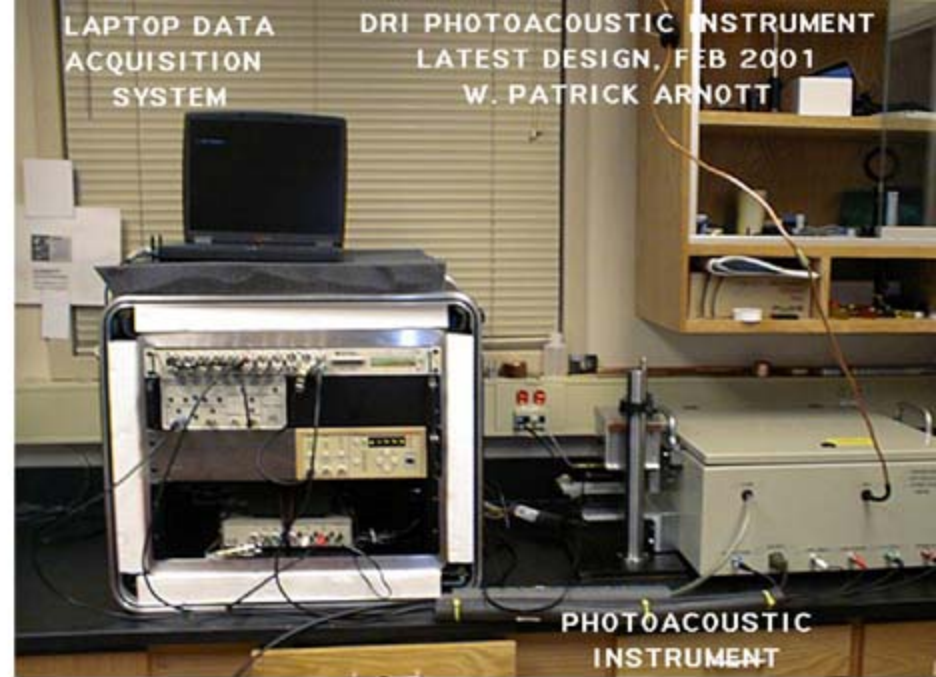


J. Rawlings  
Ghana's Former President



# Strategic Partnering with Businesses & Technology Transfer

- **2004-09 Technology:**
  - 37 invention disclosures
  - 17 patents issued
  - 4 license agreements
- **Areas of Partnership**
- **Dandini Research Park**
  - Clean Energy,
  - Environmental Sciences,
  - Life Sciences, and
  - Visualization & Information Technology



DRI faculty developed technology for measuring black carbon (soot) in the atmosphere.



# Strategic Directions in DRI's Environmental Research Mission

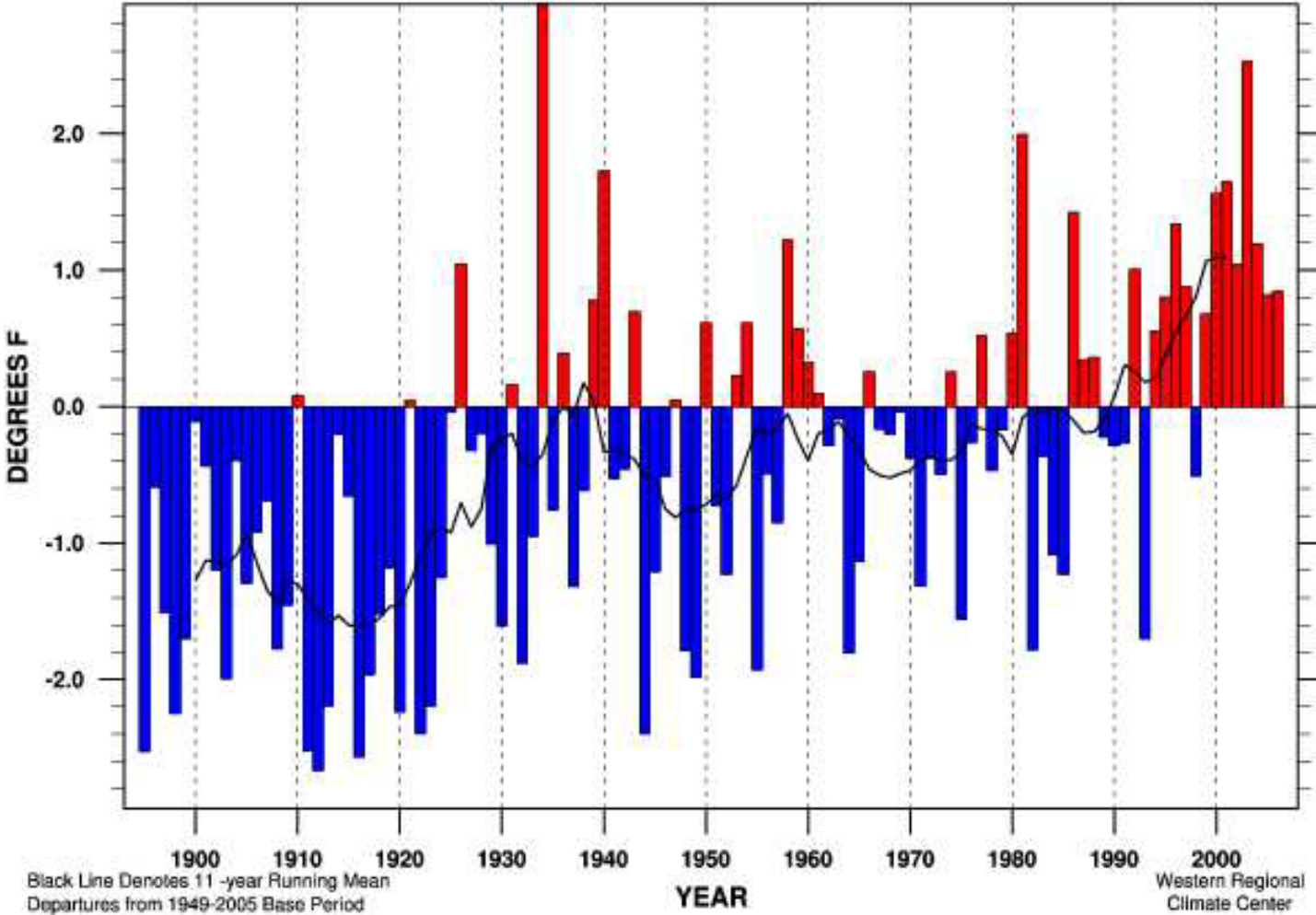
- DRI will make significant, measurable enhancements to basic & applied environmental research mission – expansion of core research:
  - Impact of climate change on earth's hydrologic, physical and biological systems
  - Environmental change and human health
  - Modeling & visualization
  - Environmental informatics
  - Clean energy systems & applied technology
  - Improved resource management & assessment



Along the edge of Greenland's vast ice sheet

# Premiere Water Assessment Program

## Nevada Statewide Mean Temperature Departure Jan-Dec



# Expand DRI's Renewable Energy Program



- **Mission:**  
promote R&D of Nevada's renewable energy, partner with the private sector, and provide renewable energy education and outreach
- Assessing application of renewable energy in desert southwestern US
  - Intermountain West Geothermal Consortium (IWGC)
  - Exploration of biomass-to-energy options and applications
- Development of energy usage monitoring systems
- Supporting rapid transition technologies from household to community applications

# New Technology and Facilities:

## Center for Advanced Visualization, Computation & Modeling



CRV Building • Opening January 2009



Inside the four-sided CAVE

- DRI's new center for faculty collaboration in visualization and advanced computation
    - technical expertise & a group of willing collaborators
    - 4- & 6-sided immersion labs
  - Thanks to
    - Governors & Legislators
    - Senator Harry Reid
    - Barrick Gold
- for all their support of the CRV Building at the State & Federal level



# New Technology and Research Directions

## Arid Lands Groundwater Research & Subsurface: Facility for Scaling Heterogeneity & Natural Environments

- Research Program & Facility
  - operating Nevada's Subsurface Facility for Scaling Heterogeneity in Natural Environments, \$3M NSF-EPSCoR grant
  - Surface & subsurface hydrology (groundwater recharge) in arid lands
  - collaboration among DRI, UNLV & UNR faculty





FIFTY YEARS OF ENVIRONMENTAL RESEARCH CHANGING LIVES

