

## **Nevada Bureau of Mines and Geology Active Projects during 2004 and 2005**

The following is a list of active projects at the Nevada Bureau of Mines and Geology (NBMG). Titles of funded projects are listed, followed in parentheses by the names of the principal investigators. The projects are funded by a variety of federal, state, and local agencies and the private sector. Although many individual projects listed below will result in maps, reports and other publications with multiple uses, the projects are listed in this table by their intended primary applications. Please note that geologic maps and most projects in basic science that underpins applications generally have many uses; the typical geologic map in Nevada has applications in earthquake, flood, and land-surface stability hazards; mineral and water resources; and environmental protection. As publications are released, they will be posted on the NBMG Web site ([www.nbmng.unr.edu](http://www.nbmng.unr.edu)) or, for external publications in the scientific literature, listed in the next NBMG Biennial Report (also available on the NBMG Web site). Feel free to contact the NBMG principal investigators to find out more about the status of these projects.

### **URBAN GROWTH - NATURAL HAZARDS AND ECONOMIC STABILITY**

#### **Earthquakes**

- Compilation of Effects and Analysis of Several Major Historical Earthquakes in Nevada  
(Craig dePolo)
- Determination of Fault Slip Rates, Paleoearthquake History, and Segmentation of the Warm Springs Valley Fault System  
(Craig dePolo and Alan Ramelli)
- Earthquake Mitigation Plans for Nevada  
(Craig dePolo)
- Earthquake Mitigation Workshop  
(Craig dePolo)
- Earthquake Risk Mitigation in Nevada  
(Craig dePolo, Jon Price; John Anderson and Diane dePolo, Nevada Seismological Laboratory)
- Effects and Analysis of Several Major Historical Earthquakes in Nevada  
(Craig dePolo)
- Geologic Mapping in the Pah Rah Mountain Quadrangle  
(John Bell and Kyle House)
- Geologic Mapping of the Southern Half of the Seven Lakes Mountain Quadrangle  
(Chris Henry, Alan Ramelli, and Jim Faulds)
- Hazards GIS  
(Ron Hess)
- Nonstructural Earthquake Mitigation Outreach  
(Craig dePolo)
- Paleoseismic Investigation of the Mohawk Valley Fault Zone, Sierra County, Northeastern California  
(Tom Sawyer, Rich Briggs, and Alan Ramelli)
- Paleoseismic Studies along the Eastern Carson Valley Fault System  
(Craig dePolo)

Paleoseismic Studies of the Little Valley Fault

(Alan Ramelli)

Quantifying seismic hazard uncertainty in the Reno-Carson metropolitan region

(John Anderson and others, Nevada Seismological Laboratory, Alan Ramelli)

Seismic History of the Mead Lake Slope fault

(Wanda Taylor, UNLV, and Craig dePolo)

The Economic Cost of Historical Earthquakes in Nevada

(Craig dePolo)

Upgrade and Enhancement of HAZUS Nevada Fault Database

(Craig dePolo and Ron Hess)

1954 Earthquake Sequence Damage and Response

(D.D. La Pointe and Craig dePolo)

### **Floods**

Application of MASTER, ASTER, and Landsat 7 Data and Technology to Ongoing Geologic

Mapping Projects at the Nevada Bureau of Mines and Geology

(Ron Hess, Kyle House, and Steve Castor)

Funding for the Nevada Hazard Mitigation Planning Committee

(Jon Price)

Geologic Mapping in the Mt Manchester Quadrangle

(Kyle House and John Bell)

Geologic Mapping in the Spirit Mountain SE Quadrangle

(Kyle House and John Bell)

Quaternary Geologic Mapping of the Desert, Hidden Valley, McCullough Pass, and Roach

Quadrangles (Kyle House and Alan Ramelli)

Surficial Geologic Mapping and Piedmont Flood Hazard Assessment in the Ivanpah Valley I-15

Corridor, Clark County, Nevada

(Kyle House, Alan Ramelli, and John Bell)

### **Subsidence and Fissures due to Groundwater Withdrawal**

Aquifer Deformation Using GPS

(Geoff Blewitt and John Bell)

Development and Transfer of InSAR and GPS Applications to Local Government in Nevada

(John Bell and Geoff Blewitt)

InSAR-Based Aquifer Deformation Maps for Subsiding Groundwater Basins in Southern Nevada

(John Bell and Falk Amelung, University of Miami)

## **MINERAL, ENERGY, AND WATER RESOURCES VITAL TO ECONOMIC EXPANSION**

### **Precious and Base Metals**

Digital Compilation of Geologic Maps of the Carlin Trend

(Ron Hess and Gary Johnson)

Geologic Mapping of the Flowery Peak Quadrangle

(Steve Castor and Kyle House)

Geology and Gold Deposits of the Jerritt Canyon District

(John Muntean)

Mining Cooperative Fund Research

(Jon Price)

Significant Mineral Deposits of Nevada, Compilation and Revision of the U.S. Geological Survey's Database

(D.D. La Pointe)

### **Industrial Minerals, including Construction Raw Materials**

Geologic Mapping in the Fernley East Quadrangle

(Jim Faulds, Alan Ramelli, and John Bell)

Minerals of Nevada

(Steve Castor)

Southern Nevada Area of Critical Environmental Concern Mineral Evaluation Project

(Steve Castor)

### **Geothermal Energy**

Expanding Geothermal Resource Utilization in Nevada through Directed Research and Public Outreach

(Lisa Shevenell)

Exploration for Concealed Structures at Desert Peak using Mercury Soil Gas Detectors

(Paul Lechler)

Exploratory Drilling Program to Evaluate the Lifetime and Current Potential of the Humboldt House Geothermal System, Pershing County, Nevada

(Gina Tempel, Department of Geological Science, Lisa Shevenell, Richard Ellis, Waibel, John Barta)

Geochemical Sampling of Thermal and Non-thermal Waters in Nevada: Evaluation of Geothermal Resources for Electrical Power Generation and Direct-use Applications

(Lisa Shevenell and Larry Garside)

Geologic and Geophysical Analysis of the Desert Peak-Brady Geothermal Fields

(Jim Faulds, Gary Oppliger, Department of Geological Sciences and Engineering, and Larry Garside)

Geothermal Assessment of Pyramid Lake Paiute Reservation Lands

(Lisa Shevenell; Mark Coolbaugh and Gary Oppliger, Department of Geological Sciences and Engineering; Jim Faulds; Wendy Calvin, Department of Geological Sciences and Engineering, and John Louie, Nevada Seismological Laboratory)

Great Basin Geothermal Systems Workshop

(Lisa Shevenell)

Nevada Geothermal Resources Database and Web Site

(Lisa Shevenell and Larry Garside)

Recent Advances and Discoveries in Geothermal Systems in the Great Basin

(Lisa Shevenell)

Regional Assessment of Exploration Potential for Geothermal Systems in the Great Basin using a Geographic Information System (GIS)

(Mark Coolbaugh, Great Basin Center for Geothermal Energy; Gary Raines, U.S. Geological Survey; Lisa Shevenell; Alex Minor, University of Nevada, Reno Computing Services; Don Sawatzky, Gary Oppliger, and Jim Taranik, Department of Geological Sciences and Engineering)

Salt Wells Reconnaissance Mapping of Surface Geothermal Features and Structure

(Jim Faulds and Mark Coolbaugh, Great Basin Center for Geothermal Energy)

Structural and Geophysical Analysis of the Desert Peak-Brady Geothermal Field: Identifying Links between Northeast-trending Structures and Geothermal Anomalies in the Great Basin

(Jim Faulds, Larry Garside; and Gary Oppliger, Department of Geological Sciences and Engineering)

Targeting Potential Geothermal Resources in the Great Basin Using Regional Relationships Between Geodetic Strain and Geological Structures

(Geoff Blewitt)

The Geothermal and Renewable Energy Laboratory of Nevada (GRELN) Overview

(Allen Gates and Lisa Shevenell)

### **Groundwater Resources**

Geologic Reconnaissance of the Granite Range Fault Zone, Washoe County, Nevada

(Jim Faulds)

### **ENVIRONMENTAL CONCERNS**

#### **Mercury and Other Chemical Hazards from Historical Mining**

Analysis of the Transport and Storage of Contaminated Sediments in the Rio Pilcomayo Basin, Bolivia

(Paul Lechler)

#### **Global Change**

Preliminary Assessment of the Potential for Sequestration of Carbon Dioxide in Geological Settings in Nevada

(Jon Price)

#### **Nuclear Waste**

Geodetic Monitoring of the Yucca Mountain Region using Continuous Global Positioning System Measurements

(Jon Price and Geoff Blewitt)

#### **Recreation**

Geologic Mapping and Digital Conversion of the Mojave Mine Quadrangle, Lake Mead National Recreation Area

(Jim Faulds)

#### **Riparian Restoration**

Ecosystem Flow Recommendation Study, Bill Williams River, Arizona

(Kyle House)

## SCIENCE TO UNDERPIN THE APPLICATIONS

### Global Geodesy

Earth's Shape, Geoid, Rheology, and Water Storage

(Geoff Blewitt)

Global Geodetic Science: Surface Mass Transport and Solid Earth Mechanics

(Geoff Blewitt)

National Geodetic Infrastructure: Status Today and Future Requirements

(Hans-Peter Plag)

Synthesis of NASA Data on Earth's Changing Geometrical and Gravitational Shapes to Assess Change in Terrestrial Water Storage and Its Effect on Sea Level, Lithospheric Loading, and Earth Rotation, and to Image Mantle Rheology

(Geoff Blewitt)

Terrestrial Reference Frame Theory and Practice for Solid Earth and Global Change Research

(Geoff Blewitt)

### Tectonics

Neogene Development of the Northern Walker Lane: An Evolving Transform Plate Boundary

(Jim Faulds, Chris Henry and Pat Cashman, Department of Geological Sciences and Engineering)

Kinematics and geodynamics of intra-plate dextral shear in eastern California and western Nevada,

Geological Society of America, Penrose Conference

(Jeff Lee, Central Washington University; Danny Stockli, University of Kansas, Chris Henry, and Tim Dixon, University of Miami)

Structural Modeling Software: Enhancing 3D Visualization of the Earth's Subsurface

(Jim Faulds)

### Other Earth Processes

Elucidating Physical Processes in Upper Crustal Magma Systems - Evidence from Miocene Intrusive and Extrusive Sequences in Southern Nevada

(Jim Faulds)

Processing Magma and Constructing Plutons in the Upper Crust

(Jim Faulds and colleagues at Vanderbilt University)

## EARTH SCIENCE EDUCATION AND OUTREACH TO THE PUBLIC

Educational Supplies for Teachers

(D.D. La Pointe)

Traveling Earth-Science Education Kits for the W.M. Keck Museum at the Mackay School of Earth Sciences and Engineering

(Rachel Dolbier, W.M. Keck Museum, and D.D. La Pointe)

Traveling the Great Basin Highway: A Guide to the Geology and Natural History along U.S. Highway 93 in Nevada and Arizona

(Jon Price and Joe Tingley).