

MEETING NOTES

GEOLOGIC MAPPING SUBCOMMITTEE of the STATE MAPPING ADVISORY COMMITTEE

1:30 to 3:30 p.m., Wednesday, August 16, 2006
Nevada Bureau of Mines and Geology (NBMG) Conference Room
Scrugham Engineering/Mines Building, Room 401
University of Nevada, Reno Campus

1:30 p.m. Welcome and Introductions by Jon Price, Director/State Geologist, Nevada Bureau of Mines and Geology (NBMG).

Jon Price reviewed the history of the State Mapping Advisory Committee (SMAC) and the Geologic Mapping Subcommittee. The purpose of this meeting is to discuss NBMG's geologic mapping priorities, particularly those that will be presented for funding assistance through the Statemap portion of the U.S. Geologic Survey's National Cooperative Geologic Mapping Program. Through the Statemap program we expect significant funding coming to NBMG to support geologic mapping. We match NBMG salaries with federal dollars to produce new geologic maps in several areas of the state. Our priority mapping areas have generally been the Las Vegas and Reno-Carson City urban areas along with rural areas, such as the Humboldt River basin, associated with potential mineral resource development and/or water-related issues.

A graphic was handed (attached) out showing that about 20% of Nevada's 1,980 7.5-minute quadrangles are adequately mapped with the detail that is needed for most applications. We still have 80% of the State to map. Over the past several years NBMG has completed about 8 to 10 geologic quad maps per year.

Review of ongoing and completed mapping projects: Chris Henry handed out two lists (attached). One listed the various projects of the "NBMG-GSN Quadrangle Mapping Program" and the other was the "NBMG Geologic Map Bibliography since 1992 and Current Projects." The lists indicate that NBMG has a backlog of maps that are Statemap deliverables that were released as open-file reports but not completed as fully published maps. A fully published map requires a vigorous field review, peer review, editorial review, and standardization of cartographic symbols.

Del Fortner asked about the status of the Tenabo Quadrangle, (a work in progress by USGS geologist, Chuck Wrucke) and Chris informed him that there still was a slight possibility that it would be completed in the not-too-distant future.

Chris and Jon Price try to locate and encourage authors to submit geologic mapping that may be complete or near completion but is sitting in a drawer, because it was part of a project that no longer exists, or the reason for production of the map was exploration and/or mine development and not necessarily publication.

Kyle House reviewed the Ivanpah project. He has been working on this project the past 4 years. The final products include surficial geologic maps of parts of nine 7.5-minute quadrangles and a derivative product showing areas that have the most potential to be flooded during a storm. The primary focus of this work included the mapping of all drainages leading to Roach Lake, a large playa in the center of the study area, which will soon become home to a new major international airport outside of Las Vegas Valley. Two of the maps shown at the meeting have been released as NBMG Open-File Reports and can be viewed on the Web as PDF files located at: <http://www.nbmq.unr.edu/dox/of068.pdf> (Surficial Geologic Map of the Ivanpah Valley Area, Clark County, Nevada, OFR-06-8) and <http://www.nbmq.unr.edu/dox/of069.pdf> (Geologic Assessment of Piedmont and Playa Flood Hazards in the Ivanpah Valley Area, Clark County, Nevada, OFR-06-9).

This project has been a Statemap priority for several years and has been jointly funded by the Clark County Flood District, Statemap, NBMG, and NASA. This project used many new mapping technologies and has significantly changed the way NBMG will be doing mapping in the future. It used conventional air photography, various types of satellite and airborne remote sensed imagery, field-hardened GPS-enabled computers for field mapping, and new ARCMAP GIS production methods.

John Muntean reviewed the Jerritt Canyon mining district work, which is an ongoing Statemap project. He is using some of the same technologies that Kyle has been developing and using in the Ivanpah project to merge and make sense out of the various company data sets that exist for his project area. He has access to company data for approximately 13,000 drill holes and various types and ages of geologic mapping throughout the area. Chris Henry will be mapping some of the volcanic rocks in the project area. The north half of the project area will be released this year as an open-file report and deliverable to Statemap. Next year the north and south halves will be released together and some detailed cross sections will be produced at the end of the project.

Jon reviewed and discussed previously established priorities for new geologic quadrangle maps in Nevada. Jon explained the "high, higher, and highest" priority classification system used on the old priority map. He also handed around several of the individual layer maps that went into the old priority classification. Areas that have been prioritized generally include the areas around Nevada's growing urban centers and include areas associated with centers of Nevada mining activity. The priorities that were developed are used as a guide to influence where new mapping will be done under the Statemap and Edmap programs.

For the upcoming Statemap proposal: Kyle House requested that the north half of Spirit Mountain Quadrangle in southern Nevada be included for new geologic mapping.

Jon requested, for Jim Faulds, that the south half of Fernley West Quadrangle be included in the upcoming proposal for new geologic mapping.

Jon and Liz Crouse presented a new prioritization model for the conversion of already published (paper geologic maps) to a full GIS product. Maps in or near urban areas would have priority along with maps in rural areas within a certain distance of various types of mineral resources, such as gold and silver mines, geothermal resources, and oil fields. Those with the greatest resources within a certain distance would have the highest priority. Maps considered for GIS conversion under this prioritization model included all NBMG geologic maps and USGS GQ series maps.

In the discussion that followed it was decided that maps of lower quality or questionable geologic accuracy should be given much lower priority in the model. There was a consensus among the group that producing a full digital GIS product for what is believed to be a poor quality geologic map was not in the best interest of the public or NBMG. Poor quality maps should be fixed or the areas in question should be remapped before GIS conversion. Maps of uncertain quality or reconnaissance-level of detail should be clearly identified as such in metadata with any GIS products.

2006-2007 Statemap Proposal: The upcoming Statemap proposal is capped at \$300,000. It is anticipated that the Spirit Mountain Quadrangle and the north half of the Fernley West Quadrangle will require about \$70,000 from Statemap. The balance of the upcoming proposal will be the conversion of existing geologic mapping to fully digital GIS products. The maps for GIS conversion will be prioritized based on the model as modified and outlined above. The consensus of the group was that this would be a worthy Statemap proposal.

Ron Hess discussed the National Agricultural Imagery Program (NAIP) that is currently being flown for Nevada. It will provide 1-meter resolution, natural color imagery for Nevada with the exception of the Nellis Air Force Range and the Nevada Test Site. Draft compressed mosaics of this imagery are expected to be available by the end of this year with the full resolution digital orthophoto quads delivered by this time next year. All of this imagery will be made available on the Keck Web site (<http://keck.library.unr.edu/>).

Eric Warmath announced that the Nevada Department of Transportation (NDOT) will be merging and SID compressing the NAIP imagery into 7.5- and 30-minute quadrangles for easier distribution on the Keck Web site. NDOT is also improving their statewide GPS network by installing additional base stations that will allow for decimeter real-time accuracy over much of Nevada.

Discussion of priorities for geologic mapping to be considered in the proposal process for 2008 included:

Ron Lynn suggested new mapping in the area around Mesquite in southern Nevada. This area is undergoing rapid urban development.

Shawn Gooch identified the Bedell Flat, Dogskin Mountain, and Patrick Quadrangles as areas of increasing urbanization and importance to Sparks.

Joe Laravie suggested more mapping in the mining areas. Twin Creeks area would be a good target for new mapping. He suggested including more information on the types of alteration associated with the mapped area and that more geophysical data (such as depth to bedrock) be included with new geologic mapping.

Matt Forest needs detailed information on faults, soils, geologic units, and depth to water table for the Carson City area. The possibility exists to put together a detailed project, similar to the Ivanpah project, for the Carson area, with Carson City, NBMG, and Statemap as cooperators. The Carson City funding would have to be approved by the Carson City Board of Supervisors.

3:30 p.m. Adjourn

For more information contact Jon Price, State Geologist and Director, Nevada Bureau of Mines and Geology (jprice@unr.edu), Chris Henry (chenry@unr.edu) or Ron Hess at 775-784-6691 Ext. 121 or e-mail (rhess@unr.edu).

LIST OF ATTENDEES

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| Jon Price | Nevada Bureau of Mines and Geology |
| Ron Hess | Nevada Bureau of Mines and Geology |
| Del Fortner | Summit Engineering |
| Joseph Laravie | Consulting Geologist |
| Christine Arritt | Nevada Bureau of Mines and Geology |
| Shawn Gooch | City of Sparks |
| Chris Henry | Nevada Bureau of Mines and Geology |
| Jim Werle | Converse Consultants |
| Ron Lynn | Clark County/NESC |
| John Muntean | Nevada Bureau of Mines and Geology |
| Liz Crouse | Nevada Bureau of Mines and Geology |
| Kyle House | Nevada Bureau of Mines and Geology |
| Alan Coyner | Nevada Division of Minerals |
| Eric Warmath | Nevada Department of Transportation |
| Matt Forest | Carson City GIS |
| Dave Boden | Truckee Meadows Community College |
| Steve Fechner | USDA Forest Service |

NBMG GEOLOGIC MAP BIBLIOGRAPHY SINCE 1992 AND CURRENT PROJECTS

Active Mapping

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 Jerritt Canyon mining district: Muntean, Henry
 Lahontan Mountains: Bell, House
 Stockton Well: Boden, Henry, Ramelli

2006

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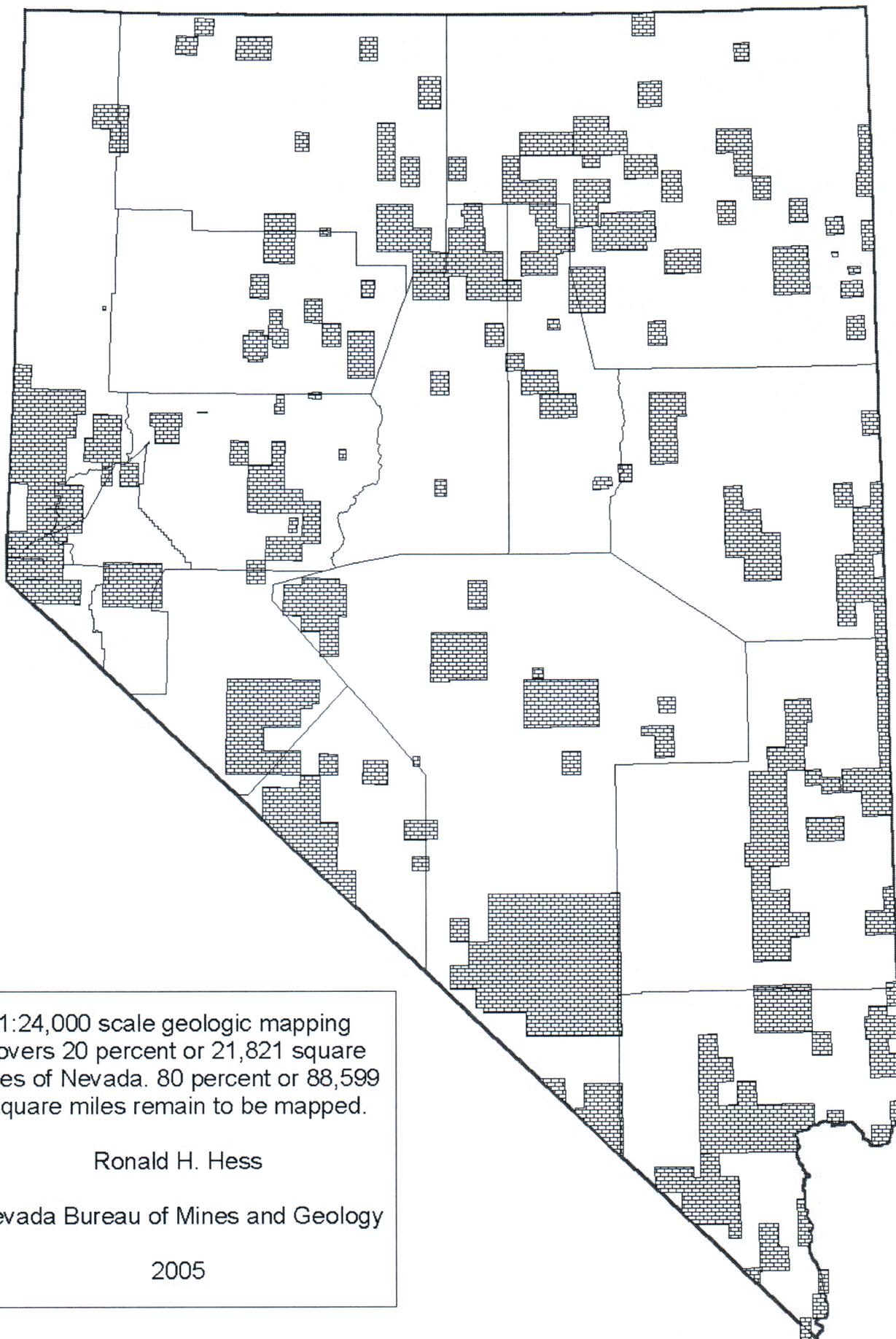
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NBMG-GSN Quadrangle Mapping Program

| Quadrangle/Area | Geologist | Year | Fund Contributor | Status |
|---|-------------------|------|----------------------|--|
| Hoover Dam | J Mills | 1991 | MCF | Map 102, 1995 |
| Bettles Well | Oldow, Meinwal | 1991 | GSN | FS-1, 1992 |
| Robinson Summit | T Feeley | 1991 | GSN | FS-2, 1993 |
| Windermere Hills area | K Mueller | 1991 | GSN | FS-4, 1993 |
| Mina | Oldow, Dockery | 1991 | Phelps Dodge | FS-6, 1993 |
| Rice Mountain | Keith and others | 1991 | Homestake | FS-7, 1994 |
| Pintail Bay | S Oleson-Elliot | 1991 | MCF | FS-8, 1994 |
| Austin | D Smith | 1991 | Homestake | Offered Open File |
| 7 quads, N Snake Range | Miller and others | 1991 | Magma, Echo Bay, M | FS-16 through 22, 1999 |
| Hot Springs Peak, Pt | E Jones | 1991 | GSN | FS-14, 1997 |
| Delvada Spring | E Jones | 1991 | Santa Fe | FS-13, 1997 |
| Mt. Rose NW | W Gates | 1991 | MCF | Rejected after field review Oct, 95 |
| Winnemucca East | S Stahl | 1991 | Santa Fe | Rejected, inadequate map |
| McCoy District 1:12,500 | Emmons, Eng | 1992 | Volunteered-Echo Bay | Map 103, 1995 |
| Antler Peak | J Doebrich | 1992 | Battle Mtn. Gold | Bulletin 109, March 1995 |
| Crater Flat | Faulds and others | 1992 | NWPO | Map 101, 1994 |
| Job Peak | D John | 1992 | GSN | FS-5, 1993 |
| Reveille | M Martin | 1992 | NWPO | Map 104, 1995 |
| Welcome | A Snoke | 1992 | Kennecott | Preliminary field review done 8/97 |
| Tenabo | C Wrucke | 1992 | Echo Bay, Rio Algon | Promised by 1998, still waiting |
| Dicalite Summit | J Oldow | 1992 | GSN | expired 2/28/94 |
| Government Wash | Duebendorfer | 1992 | GSN | Map 140, 2003 |
| Pirouette Mtn | D John | 1993 | GSN | FS-9, 1995 |
| Timber Mtn. Pass West | D Wood | 1993 | GSN | Promised Feb 96 |
| Castle Mtns area | Capps, Moore | 1993 | Volunteered-Viceroy | Map 108, 1997 |
| Blue Diamond SE | Carr et al | | Volunteered | Map 123, 2000 |
| Blue Diamond NE | McDonnell-Canan | | Volunteered | Map 124, 2000 |
| Mount Davis | Faulds | 1994 | GSN | Map 105, 1996 |
| Fire Mtn | Faulds | 1994 | freebie | Map 106, 1996 |
| Sand Springs Range | Satterfield | 1994 | GSN | Map 133, 2002 |
| Fairview Peak | Best, Hintze | 1994 | GSN | Map 114, 1998 |
| Eugene Mtns area | Thole, Prihar | | Volunteered | Map 115, 1998 |
| Hussman Spring | Dilles | 1995 | Kennecott | Author digitizing |
| Frazier Creek | McKee | 1995 | GSN | FS-15, 1998 |
| Bailey Pass | Conrad | 1995 | GSN | Received preliminary map; need final |
| Stump Spring, Green Monster Mine, West of Shenandoah Peak | McMackin | 1995 | GSN | Received preliminary Stump Spring; final promised early 06 |
| Carson City 1:100,000 | J Stewart | | Volunteered USGS | Map 118, 1999 |
| Wonder Mtn | John | 1996 | GSN | Map 109, 1997 |
| Harrison Pass | Burton | 1996 | GSN | Author digitizing |
| Lamoille | Howard | 1996 | O Christensen, New | Map 125, 2000 |
| Bullfrog Hills | Weiss, Connors | 1996 | DOE | Map 112, 1998 |
| White Horse Pass | Silberling, Nich | 1997 | GSN | Map 132, 2002 |
| Sacramento Pass | Miller | 1997 | GSN | In progress |
| Wood Hills | Camilleri | 1998 | GSN | Started cartography |
| Pequop Mts | Camilleri | 1999 | GSN | Started cartography |
| East Humboldt Peak | McGrew | 1998 | GSN | In progress |
| Lime Mountain | Hintze, Axen | | Volunteered | Map 129, 2001 |
| Hiller Mts | Howard et al | | Volunteered | Map 137, 2003 |
| Verdi Peak | Howard, MacCr | 1999 | NBMG | Map 147, 2004 |
| Callville Bay | Anderson | 1999 | NBMG | Map 139, 2003 |
| Willow Creek Resv | A Wallace | | USGS | Map 135, 2003 |
| Willow Creek Resv | SA Wallace | | USGS | Map 136, 2003 |

| | | | |
|--|-------------------|------------------|--|
| Bobs Flat | Peters | Volunteered USGS | Map 138, 2003 |
| Mesquite | Williams | Volunteered USGS | Office and field review done; waiting for author |
| Cooper Peak | Murphy, McKee etc | Volunteered | Nearly ready for publication |
| Butte Range | B Otto | Volunteered | Cartography nearly completed |
| Beaver Peak | T Theodore et al | USGS | Map 143, 2003 |
| Mule Canyon | D John, C Wrucke | USGS | Map 144, 2003 |
| Big Bald Mt | C Nutt, Hart | USGS | Map 145, 2003 |
| Santa Renia Fields | Theodore et al | USGS | Map 155, 2006 (out any day) |
| Oxley Peak | Thorman et al | USGS | Open-file report 03-4, 2003 |
| Northern Carlin trend | S. Moore | Newmont | NBMG Bulletin 111, 2002 |
| Maggie Creek, Carlin | J Norby | Newmont | NBMG Bulletin 111, 2002 |
| Northern Carlin trend | S Keith | NBMG | Open-file report 03-1, 2003 |
| Chalk Hills | Schwartz, Faulds | Volunteered | Open-file report 04-11 |
| Bullwhacker Spring, Callaway Well, Troy Canyon | J Fryxell | NBMG | Bullwhacker Spring promised Sept 06 |
| Singeltree Creek | Steve Moore | Volunteered | In progress |
| Kelly Creek area | Joseph Laravie | Volunteered | Open-file report 05-1, 2005 |
| Golconda Canyon | Zac Gonsior | Volunteered | Open-file report 06-4, 2006 |
| The Cedars | Thomas Moore | USGS | started office review |

Nevada 1:24,000 Scale Geologic Mapping



1:24,000 scale geologic mapping covers 20 percent or 21,821 square miles of Nevada. 80 percent or 88,599 square miles remain to be mapped.

Ronald H. Hess

Nevada Bureau of Mines and Geology

2005