Geological Society of Nevada
Southern Nevada Chapter
Newsletter

April 2004

UNLV Geoscience Department Graduate Student Presentations

DATE: Thursday, April 29, 2004

SPEAKERS: Kristeen Bennett
Elizabeth M. Glowiak
Joseph Kula

LOCATION: Room 102 Lilly Fong Geoscience Bldg.

TIME: 5:30 p.m. Social Hour
6:30 p.m. Presentation

Hello Everyone! We would like to thank Craig Westenberg of the U.S.G.S. for his talk last month. We always appreciate scientists taking time out of their busy schedules to share their research with us. This months meeting will be our last for a few months. We are in the process of scheduling a mid-summer meeting (possibly in July or maybe August) so we'll be sure to keep everyone informed. We may also be looking for a speaker as well.

Every once in a while our officers change, and this is that time. Two of our long-term officers (Chris Riecken and Jim O'Donnell) have stepped aside and taken roles as advisors to allow new officers to get involved. I will put contact information for each officer on the website as soon as possible. Enjoy the meeting.

See You Soon,

Robyn

PARKING:

We would like to remind everyone about the parking rules near the Lilly Fong Geoscience Building, and throughout campus. A permit is required to park on campus from 7 a.m. to 7 p.m. There are metered spaces throughout campus as well as free parking near Swenson and Harmon. The spaces in front of the Geoscience building are reserved for vehicles with faculty/staff permits from 7 a.m. to 7 p.m. but student permits are allowed after 5 p.m. Daily permits can be purchased at the Public Services Office. We are sorry if you receive a ticket but unfortunately there is nothing we can do to fix it. http://www.unlv.edu/studentlife/parking/

SPRING FIELD TRIP:

We are currently looking for a person or group to host our spring fieldtrip to a location in southern Nevada. Our trips are usually day trips during the month of May. We will organize the trip fully all you have to do is plan an itinerary and educate us ☺.

ADVERTISEMENTS & MEETING SPONSORS:

We would all like to thank Paul Bowen of R.P. Bowen Engineering for sponsoring our February GSN meeting. Thanks Paul! If your business would like to sponsor a GSN southern Nevada chapter meeting or place a paid advertisement in this newsletter and on our website please contact Jim O'Donnell at jim_odonnell@cox.net. Please see our current advertisements at the end of this newsletter and support our sponsors.

SPEAKERS:

This is our last meeting of the year but if you are interested in presenting your research at a future GSN meeting please feel free to contact Amy Brock at 702-895-3583 or alb@unlv.nevada.edu.

The Panther Creek Volcano:
A newly discovered basaltic vent in Yellowstone National Park

KRISTEEN BENNETT and EUGENE SMITH

The Panther Creek Volcano is a previously undescribed basaltic vent within the Pleistocene Swan Lake Flat basalt in the northwestern part of Yellowstone National Park. Located 1.8 km southwest of Swan Lake, this volcano is about 0.75 km in diameter at its base. Basaltic eruptions have occurred throughout the history of the Yellowstone volcanic system (2.1 Ma to the present), but the youngest (<0.6 Ma) of these occur north of the caldera in the Norris-Mammoth corridor. The Swan Lake Flat basalt is the least eroded and most voluminous basaltic unit within the corridor. Typically basaltic eruptions within the Yellowstone Plateau were Hawaiian in nature producing low-volume flows that result in small shields. Scoria and bombs observed near the summits of several of these shield suggest that eruptions may have cumulated with a Strombolian phase. This new vent is atypical within this volcanic field because its eruption style was primarily Strombolian. This eruption occurred in three phases. During the first phase, welded scoria and bombs produced a broad cone. Bombs are cored with partially melted "rhyolite" xenoliths. Lava flows with subtle banding erupted during phase 2. The flows can be traced as far as Indian Creek to the south and Swan Lake to the north. Some of these flows ponded in a lava lake in the summit crater of the cone. During the third phase welded scoria and bombs were again erupted. A 2.5-m wide composite dike on the northeastern side of the cone may represent a feeder dike. The outer portion of the dike is massive, phenocrysts-poor basalt containing 4 to 25 cm diameter partially-melted granitic xenoliths.

The inner portion of the dike is similar in texture and mineralogy but does not contain xenoliths. Last of all, these tholeiites vary little in chemical composition. Although, flows from this new vent are higher in Cr and lower in Ba and Rb compared to the other Swan Lake Flat flows. More importantly, with ε_{Nd} values of -0.18 to 0.20, this volcanic vent and its associated flows are the most primitive sampled in the park. This suggests that the partially-melted felsic xenoliths contributed little or no contamination to the unit. Because of increased activity within the Norris Geyser Basin there is renewed interest in volcanism in the Norris-Mammoth corridor. It is also important to understand the style of any future eruption because the Strombolian style of the Panther Creek volcano adds to the list of potential volcanic hazards in the corridor.

Speaker's Background & Education

Kristeen graduated from California State University, Chico with a Bachelor of Science degree in Geoscience in May 2002. She is currently completing a Master of Science degree in Geology at UNLV and expects to receive her degree in June 2004. Her research focuses on volcanology and petrogenesis of mafic volcanism.

Stewart Island, New Zealand: A record of Paleozoic-Mesozoic arc magmatism, intra-arc tectonism, and continental extension and fragmentation.

JOSEPH KULA

The Sisters Islets; Cretaceous(?) hangingwall conglomerates dipping NW toward a mylonitic shear zone exposed along the southeast coast of Stewart Island.

Stewart Island sits just south of South Island, New Zealand. Rocks exposed on Stewart Island indicate it represents the southern extension of the Median Batholith, which is the Paleozoic-Mesozoic magmatic arc that developed along the Pacific margin of Gondwana. In addition to the presence of arc rocks, several structures have been recognized that represent intra-arc tectonic events. $^{40}Ar/^{39}Ar$ thermochronometry indicates that two of these structures; the Freshwater Fault and the Escarpment fault may have accommodated Early Cretaceous shortening and burial. A shear zone exposed along the southeast coast of Stewart Island, along with overlying conglomerates, appears to have accommodated extension in the Mid-to-Late Cretaceous that culminated in separation of New Zealand from Antarctica and opening of the Great South Basin and the Ross Sea. This shear zone is represented by granitic mylonites grading upward into chloritic breccia, with top-to-the-southeast shear sense and stretching lineations trending ~150°. Offshore, conglomerate beds are exposed on two islets (known as the Sisters). These beds strike ~070° and dip 20-25° NW back toward the mylonites, indicating a detachment surface may be present beneath the sea. Microstructural and thermochronometric studies are continuing to investigate the kinematics, timing, and thermal history of this likely Cretaceous extensional shear zone.

Speaker's Background & Education

Joseph is currently a Ph.D. student in the Geoscience Department at UNLV. He earned a B.S. in Geoscience from Montclair State University in New Jersey in May 2000, and a M.S. in Geoscience from UNLV in December 2002. His first introduction to geologic research was in New Jersey where as an undergraduate he worked on the geochemistry of 1300 Ma Losee amphibolites to determine the tectonic setting and protolith. It was later at UNLV where he was introduced to $^{40}Ar/^{39}Ar$ thermochronometry that he realized where his true passion lies. He is presently engaged in research involving application of $^{40}Ar/^{39}Ar$ thermochronometry to unravel the Mesozoic tectonic history of the southwest United States and Stewart Island, New Zealand, as well as research in development of the $^{40}Ar/^{39}Ar$ technique.

A Taphonomic Analysis of the Gypsum Cave, NV Pleistocene Mammals: Implications of Fire, Fractures, and Scratch Marks.

ELIZABETH A. GLOWIAK

Gypsum Cave, NV is the site of a 1930 archaeological and paleontological excavation, which yielded numerous remains of Pleistocene mammals and human artifacts. The mammal remains include species of extinct camel (*Camelops hesternus*), llama, (*Hemiauchenia macrocephala*), sloth (*Nothrotheriops shastensis*), two species of extinct horse (*Equus* sp.), and extant species of deer (*Odocoileus hemionious*), bighorn sheep (*Ovis canadensis*), gray fox (*Urocyon cinereoargenteus*), and kit fox (*Vulpes velos*). This study represents the first description and documentation of the Gypsum Cave large mammal remains.

Several taphonomic processes have affected the bones since the Pleistocene. For instance, 38% of the bones from Gypsum Cave have either been smoked or calcinated, representing past fire events in the cave. Also, nearly all of the bones exhibit fractures, commonly spiral fractures, and fine parallel indentations which indicate human or carnivore interaction, trampling, or roof fall events. The purpose of this study is to document the taphonomic processes to determine whether Gypsum Cave represents a site of Pleistocene human/mammal interaction or a carnivores den.

Speaker's Background & Education

Elizabeth Glowiak received an Associate in Art and an Associate in Science at College of DuPage, Glen Ellyn, IL in 2000 and a Bachelor of Science in Geology and Environmental Geosciences at Northern Illinois University in 2002 and is close to receiving a Master of Science in Geology at UNLV.