



# GEOLOGICAL SOCIETY OF NEVADA NEWSLETTER

Geological Society of Nevada, 2175 Raggio Parkway, Room 107, Reno, NV 89512  
(775) 323-3500 - Hours Tuesday -- Friday, 8:30 a.m. to 3 p.m. Monday by appointment.  
Website: [www.gsnv.org](http://www.gsnv.org) • E-mail: [gsn@gsnv.org](mailto:gsn@gsnv.org)



March 2018, Vol. 34, No. 3

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## CALENDAR OF GSN EVENTS

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[Kelly.cluer@kinross.com](mailto:Kelly.cluer@kinross.com)

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Consultant, Geologist  
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[gsn@gsnv.org](mailto:gsn@gsnv.org)

### GSN BOARD OF DIRECTORS

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Current GSN President:  
Kelly Cluer

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Elko Chapter President  
Mark Travis

So. Nevada Chapter President  
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Winnemucca Chapter President  
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Class A, 2015-2018  
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Class B, 2016-2019  
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Class C, 2017-2020  
David Shaddrick  
Camille Prenn

March 1, 2018  
THURSDAY

**SO. NEVADA CHAPTER MEMBERSHIP MEETING (1st Thursdays)**  
The meeting will be held at the LV Natural History Museum, 900 N. Las Vegas Blvd. Pizza & beer at 5:30 pm, Talk at 6:00 pm. **Speaker: Mr. Drew Barkoff, PhD Student, UNLV. Title: "Pressure and depth constraints on skarn mineralization at Casting Copper and Ludwig, NV, based on apatite and quartz inclusions in garnet". Drinks & Food Sponsored by: GEOSYNTEC CONSULTANTS!** Please contact Chapter President, Paul Dockweiler for information @ [PDockweiler@Geosyntec.com](mailto:PDockweiler@Geosyntec.com). Details and abstract on page 2.

Mar. 14, 2018  
WEDNESDAY

**WINNEMUCCA CHAPTER MEMBERSHIP MEETING (2nd Wednesdays)**  
The meeting will be held at the Martin Hotel, 94 W. Railroad St., Winnemucca, NV. Refreshments/appetizers at 6 p.m. Talk at 7:00 pm. **Speaker & Topic: To Be Announced . Sponsor: CYANCO!** For more information please contact Chapter President, Matt Fithian @ [Matthew.Fithian@ssrmining.com](mailto:Matthew.Fithian@ssrmining.com). Details on page 7.

Mar. 15, 2018  
THURSDAY

**ELKO CHAPTER MEMBERSHIP MEETING (3rd Thursdays)**  
The monthly meeting will be held at the Western Folklife Center, 501 Railroad St., Elko, NV. Refreshments begin at 6 p.m. Talk begins at 7 p.m. **Speaker & Topic: To Be Announced. Sponsor: TONATEC EXPLORATION, LLC!** For more info please contact Mark Travis at: [mark.william.travis@gmail.com](mailto:mark.william.travis@gmail.com). Details on page 7.

Mar. 16, 2018  
FRIDAY

**GSN REGULAR MEMBERSHIP MEETING (3rd Fridays)**  
The monthly meeting will be held at the Reno Elks Lodge, 597 Kumle Lane, Reno, Nevada. Drinks @ 6 p.m., Dinner @ 7 p.m., Talk at 7:45 p.m. **Speaker: George Salamis, Exec. Chairman, Integra Resources. Title: "Innovating to Succeed: Insights into the Integra Junior Explorer Business Model". Drinks Sponsored by: EM STRATEGIES!** Cost for Dinner—\$25. GSN Students are free. Please make reservations for dinner with Laura Ruud, by emailing [gsn@gsnv.org](mailto:gsn@gsnv.org). 775-323-3500. Details & abstract on page 3.

## G.S.N. MARCH SPONSOR!





## GSN SOUTHERN NEVADA CHAPTER MEETING

**THURSDAY, MARCH 1, 2018**

**Location: Las Vegas Natural History Museum  
900 North Las Vegas Blvd, Las Vegas, NV**

**Time: 5:30 p.m.—Pizza & Beer  
6:00 p.m.—Talk begins**

**Speaker: Mr. Drew Barkoff, PhD student, Economic Geology, UNLV**

**Title: Pressure and depth constraints on skarn mineralization at Casting Copper and Ludwig, NV, based on apatite and quartz inclusions in garnet**

**Sponsor: GEOSYNTEC CONSULTANTS**

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### **ABSTRACT:**

This study presents the first application of mineral-inclusion thermobarometry to a hydrothermal-metasomatic system. Thermobarometry of metasomatic rocks is commonly challenging, owing to the high variance of hydrothermal mineral assemblages, thermodynamic disequilibrium, and overprinting by subsequent hydrothermal episodes. As mineral inclusions and their corresponding host minerals are exhumed to the surface and cool to ambient temperatures, volume perturbations may be different owing to differences between their physical properties. The difference in compressibility and thermal expansivity between the inclusion and its host results in the development of pressurization of the inclusion. Raman spectroscopy was used to quantify the internal pressures of each inclusion because Raman spectra are pressure-dependent. The internal pressures of these inclusions were applied to an elastic model which accounts for the different rates of expansion of the minerals involved as a function of changes in pressure and temperature to provide us with the original pressure conditions under which the mineral inclusion was enclosed.

***The G.S.N. wishes to thank  
MINE DEVELOPMENT ASSOCIATES  
For sponsoring the February 16th  
membership meeting in Reno!***



**MINE DEVELOPMENT  
ASSOCIATES**

# **GSN MONTHLY MEETING—MARCH 16, 2018**

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**SPEAKER: George Salamis, Executive Chairman, Integra Gold**

**TITLE: “Innovating to Succeed: Insights into the Integra Junior Explorer Business Model”**

**Social Hour begins @ 6:00 pm; Dinner @ 7:00 pm; Talk @ 7:45 pm**

**Location: Reno Elks Lodge, 597 Kumle Lane, Reno NV (across from the Convention Center)**

**DINNER COST—\$25.00 per person.**

**Reservations due by 5:00 p.m. on WEDNESDAY, MARCH 14, 2018**

For dinner reservations, please e-mail [gsn@gsnv.org](mailto:gsn@gsnv.org) or call 775-323-3500

**(Please remember you will be invoiced \$25 if you do not cancel your reservation by Mar. 15th)**

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**“Innovating to Succeed: Insights into the Integra Junior Explorer Business Model”**

**George Salamis, Integra Gold**

As Executive Chairman of Integra Gold, George Salamis led its 2017 acquisition by Eldorado Gold for \$US 500 Million. 5 years prior, Integra was an exploration company with a \$15 million market cap entering what would become one of the most depressed commodity cycles in history. Counter to this cycle, George and his team created immense value for shareholders and stakeholders, culminating in a transaction that delivered a 52% premium to shareholders.

It all came down to out-of-the-box thinking and timing the market. George will discuss Integra’s transformative and opportunistic acquisition of what was once Québec’s largest gold mine, the Sigma-Lamaque Complex in the “Valley of Gold”, Val-d’Or, Québec. He will outline the strategy that was opposite of the market norm at the time: raise capital for its high-grade, low-cost Lamaque project and find gold. And he will talk about the importance of thinking differently. While Integra aggressively drilled the Lamaque Project, outlined a new deposit and began underground development, the team remained convinced much more gold existed under the historic mines. Armed with 6 terabytes of digitized data, George led the successful crowd-sourced *Integra Gold Rush Challenge*, where over 1,400 applicants from 83 countries around the world mined data and pitched plans to unlock the potential hidden in the shadows of the headframes. \$1 million was granted to winning teams that provided the best exploration targets, using a combination of Artificial Intelligence, machine learning and Virtual Reality to identify high value gold targets. And it worked - gold was later found at these targets within the Lamaque Project, and Integra was the talk of the industry. The *Gold Rush Challenge* became a catalyst for the mining and tech sectors to collide, unravelling the great mystery of discovery.

George is back at it again, this time in Idaho. With a fresh approach, new thinking and strong capital, George launched Integra Resources and acquired the DeLamar Silver and Gold Project from Kinross Gold in August 2017. With striking similarities to the Lamaque Project – stable mining jurisdiction, established production history and ‘under the radar’ resource potential – George will discuss the current climate for junior explorers. Everything about mining is changing and that pace of change is bound to accelerate. But mining has a strategic role to play in the 21<sup>st</sup> century economy and junior companies represent the pipeline to the future. The new realities in mining finance are clear - only a few specialized projects are getting funded. George will share his ideas on how to stand out among the pack.

## “FACES OF GSN”

### NANCY RICHTER, ELKO, NEVADA

I arrived in this world in Brooklyn, NY – not the most likely place to spawn a mineral exploration geologist. At the age of 9, my family moved to Cape Vincent, NY, a village of 300 souls located on the idyllic banks of the St. Lawrence River. Winters were spent ice skating and sledding, summers were spent swimming, riding bikes and fishing.

In the fall of 1976, my folks drove me to SUNY Binghamton, gave me a kiss and waved goodbye. Having no idea what I wanted to study, I declared English as a major and envisioned that I would end up as a copy editor for a publishing company. After a year of partying, I decided college was not where I wanted to be. I spent the summer working several jobs and, in the fall, headed west in a Toyota Corolla with two friends and our backpacks. When the money ran out, I returned to NY and went to work as a secretary in lower Manhattan and temped around the city at night operating a word processor (precursor to Microsoft Word - dating myself here). The cultural scene in NYC was fabulous but I missed the outdoors. I frequently revisited the photos I had taken during my western journey and noticed that every photo had rocks in it. That's when I got the great idea to go back to college and study geology.



*Undisclosed field location, circa 1982*

After completing a year at the State University in Oswego, NY, I moved to Flagstaff, AZ to continue my education. I landed a part time job in the paleomagnetism lab at the USGS as part of the minority program (back in those days, women geoscientists really were a minority). During the field season, we collected paleomagnetic samples in places like the Grand Canyon and Glacier National Park; winters were spent sitting in a Helmholtz coil, analyzing those samples. Other great opportunities with the USGS included mapping proposed Wilderness Study Areas in Arizona and mapping in the US Virgin Islands as part of a program to assess the islands' mineral potential. My passion in undergraduate school was paleontology and I envisioned that I would eventually work in a natural history museum. That all changed one day when we took a field trip to an underground copper mine. It was like discovering surround sound – the rocks were everywhere and I found my calling.

My position at the USGS was a student appointment which ended when I completed my Bachelors' degree. My supervisor offered to continue support if I attended graduate school, so I headed off to the University of Arizona. Porphyry copper deposits were big in that

day but I had my mind set on working on a Precambrian volcanogenic massive sulfide system and, under the guidance of Spence Tittley and John Guilbert, completed my Master's on the geochemistry of exhalites at the Copper Chief mine in the Jerome district of Arizona.

(continued on pg. 5)

(Richter, cont. from pg. 4)

The year was 1986. Copper prices were down and they were busting the unions in Arizona so I headed north to Reno. What followed was 10 years of 10 on/4 off, in colorful places including Baker, Randsburg and Lorraine, California; Bouse, Quartzite and Parker, Arizona; Vale, Oregon and, of course, the garden spots of Nevada: Ely, Eureka, Austin, Silver Peak, Pioche, Hawthorne, Winnemucca, Battle Mountain and Elko. Employers included FMC, Silver King Mines, Alta Gold, Westmont Mining, Billiton Minerals and Newmont. The jobs varied from working on a drill rig (including catching samples) in temperature ranging from  $-25^{\circ}$  to  $+120^{\circ}$ , stream sediment and BLEG sampling, soil sampling, mapping, helicopter reconnaissance, target generation, project management and mine geology.



*Drilling for barite, Beaver Peak, Elko County. Swales Mtn in background. Note the lack of PPE.*



*Soil sampling in style, No Tell 'em Butte, 1992*

All this came to a halt in 1996 when I left the minerals industry to be a stay at home mom and moved to Yellow Pine, Idaho where my husband took a job at the Stibnite Mine. In 1997, the price of metals was dropping (again) and so we bought the general store in town. I had learned a lot in school and on the job, but nothing prepared me for what I learned living in a town of 50 year-round residents in remote Idaho. I learned to value humility and diversity and what it meant to be part of a community where you help each other survive. I came to appreciate that people of all socio-economic backgrounds share common desires such as being able to provide for our families, to enjoy good health and quality of life and to experience pride in our accomplishments.

In 2001, my daughter became the only child in town and the 1 room schoolhouse closed. We home schooled for 2 years but she was missing the socialization that comes along with attending public school. We sold the store and headed for southwestern Idaho where I took a job with some friends (continued pg. 6)

(Richter, cont. from pg. 5)

who had an engineering firm. My first assignment was to draft up a plan for a pole barn building, my last was to design a subdivision.

In 2005, the bust cycle was over, the price of gold was on the rise and experienced geologists were at a premium. I attended the GSN Symposium, saw what was going on in the Cortez district and hounded any Placer Dome geo who would stand still long enough for me to strike up a conversation. I accepted a job as a contract core logger at Cortez and subsequently was hired full time when Barrick took over. Since then, I've been provided challenging assignments of increasing responsibility at Cortez, Bald Mountain and Turquoise Ridge and continue to learn from some of the brightest people in the industry.

Reflecting back on my career, I realize that many things had changed over the years, but some things haven't changed at all. The rocks haven't changed but our understanding of them has; the fundamentals of geology haven't changed, but the technology that we use to evaluate the geology has; the passion that exploration geologists bring to their work hasn't changed but the diversity of the work force has. The one thing that hasn't changed at all is the excitement we experience when we get our assays back and we've collected the hot sample or drilled the hot hole. I can't imagine doing anything more fun for a living.



*Drilling with Barrick, Turquoise Ridge, 2014.*



*Rafting the Green River, Dinosaur National Monument, note the Eklund hat! Circa 1993.*

## **GSN WINNEMUCCA CHAPTER MEETING**

**WEDNESDAY, MARCH 14, 2018**

**Location: The MARTIN HOTEL, 94 Railroad St., Winnemucca, NV**

**Time: 6:00 p.m.—Appetizers & Drinks**

**7:00 p.m.—Talk begins**

**Speaker & Topic: To Be Announced**

**Food and Drinks Sponsored by: CYANCO**



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## **GSN ELKO CHAPTER MEETING**

**THURSDAY, MARCH 15, 2018**

**Location: The WESTERN FOLKLIFE CENTER, 501 Railroad St., Elko**

**Time: Appetizers & Drinks @ 6:00 p.m., Talk @ 7:00 p.m.**

**Speaker & Topic: To Be Announced**

**Food and Drinks Sponsored by: TonaTec Exploration, LLC**



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### **It's time to Volunteer For, or Nominate Chapter Officers for 2018-19!**

If you have been contemplating helping out your GSN organization by volunteering to be a Chapter Officer this is the time to step forward! Nominations for positions must be finalized at the April Chapter meetings and ballots will be sent out following so the winners can be announced in May.

The Elko Chapter will need a new President as Mark Travis served as VP in 2014-15 and now 3 years as President from 2015-2018! Also, the So. Nevada Chapter is in dire need of people to volunteer for officers. Paul Dockweiler has served 2 years as President and is stepping down on May 31st.

**To volunteer/nominate for Elko positions please contact Chelsey Raley @ [chelsearaley1@gmail.com](mailto:chelsearaley1@gmail.com).  
For the So. Nevada Chapter please contact Paul Dockweiler @ [pdockweiler@geosyntec.com](mailto:pdockweiler@geosyntec.com) and  
for the Winnemucca Chapter please contact Matt Fithian @ [matthew.fithian@srmining.com](mailto:matthew.fithian@srmining.com).**

# GSN FOUNDATION

Many of the Foundation's donations support programs that impact students with an eye to filling the pipeline with future geologists; Geology scholarships at UNR and UNLV, the K-12 Field Trips, UNR Field Camp scholarships for geology students, support for graduate students' Nevada projects, and field mapping course support for CREG students. There is one program that benefits geologists right here, right now – and that's our support for the Nevada Bureau of Mines and Geology mapping programs.

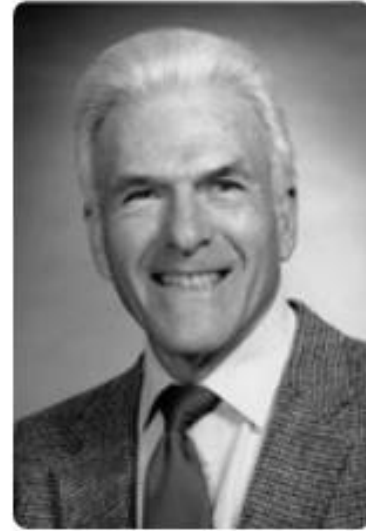
With help from Chris Henry and Mike Ressel, we have a list of maps that GSN has supported and it's pretty extensive. A total of 31 maps were funded and of those, 23 were published and four more are ready for publication in 2018. Coming up for 2018 are Sacramento Pass, Humboldt Peak, Kelly Creek, and East Range.

This is just another reminder that your generous donations are providing real benefits for the industry and fulfilling GSN's purpose. "GSN is a scientific society dedicated to promoting the geological sciences. It is an IRS 501(c)6 educational organization with non-profit tax status. GSN Exists to benefit its members and provide opportunities to enhance their geologic knowledge."

Cami Prenn, GSN Foundation Chair



Save THE DATES for the GSN Spring 2018 Field Trip scheduled for June 8-10, 2018. The trip will be visiting the Monte Cristos and the Eastside area. We expect the trip to sell out so plan ahead and save your spot early. You won't want to miss this one!



## Honoring a Founder of GSN – David B. ("Burt") Slemmons by Steve Weiss, GSN Secretary

Would you be interested in supporting an initiative to honor one of GSN's founders and Honorary Members, Professor David B. (Burt) Slemmons, who passed away in May of 2017? An informal, but growing group of Burt's former students, colleagues, friends and family members are seeking to add his name to the Center for Neotectonic Studies at the University of Nevada, Reno. Among many other accomplishments, Burt founded the Center for Neotectonic Studies ("CNS") in the late 1980s to advance the understanding of active faults in Nevada and elsewhere. The CNS is an academic and research unit established by the University and Community College System of Nevada's Board of Regents, and is located within the Mackay School of Earth Science and Engineering, College of Science. If you would be in favor of this initiative, or being part of this effort, or you would like more information, please contact Peg O'Malley ([peggraphix@sbcglobal.net](mailto:peggraphix@sbcglobal.net)) or Steve Weiss ([siraweiss@outlook.com](mailto:siraweiss@outlook.com)).



*Thank you to our generous DONORS in FEBRUARY!*

**G.S.N. FOUNDATION**

**PLATINUM DONORS +\$1,000**

**GOLD DONORS \$500-\$999**

**SILVER DONORS \$100-\$499**

**BRONZE DONORS \$1-\$99**

Elizabeth A. Crafford

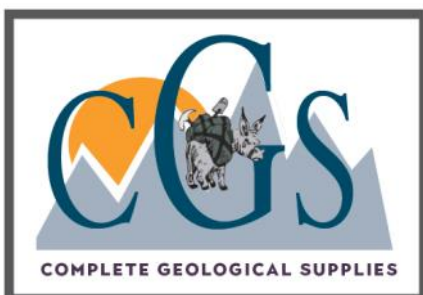
**G.S.N. Student Dinner Fund**

Sam Arentz, III  
Catherine Clark  
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Mack Taylor

*Thank you to our generous sponsor for the Winnemucca Chapter Meeting in February*



*Thank you to our generous sponsors for the Elko Chapter Meeting in February*

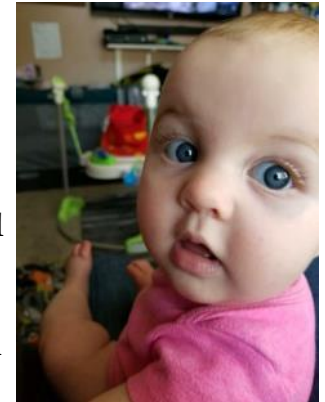


**LOTS OF G.S.N. BABY NEWS!!**

**Harris William Weatherwax** was born November 27th, 2017, in Reno. He is of mixed heritage; his father, Trent Weatherwax, is a mining engineer and his mother, Meghan Jackson, is a geologist. Both are former members of the Winnemucca chapter and current members of the Elko chapter of GSN, where Harris attended his first meeting in January. He indicated his approval of Moira Smith's excellent talk by sleeping right through it. Early indications suggest that his parents will continue to love him no matter which path he follows when offered the choice between the hammer and the slide rule.



**Nellas Magrathea Travis** was born on June 5, 2017 and is already 9 months old. Nellas proud parents are GSN's Elko Chapter President, Mark Travis and his wife, Tamara Mattheus. Nellas also has 2 older brothers, Liam, 9 and Durham who is 3.



**Sydney Elsdon Larson** born June 17th, 2017 in Boise, Idaho to Samantha and Kyle Larson. Syd is a man of few words and four teeth. He enjoys staring at trees and blowing bubbles.



# Activity Update

Mike Brady, January 2018  
[www.activityupdate.com](http://www.activityupdate.com)

## NEVADA

Fremont Gold Ltd. announced that it acquired an option to earn a 100% interest in the Gold Canyon Property from Ely Gold Royalties Inc. for \$802,000 cash over 5 years. *Press Release:* January 16

Canarc Resources Corp. announced that recent drill results at the Fondaway Canyon Project include 66.1-78.6 meters @ 0.42 gpt Au (FC17-4); 216.0-217.2 meters @ 5.45 gpt Au (FC17-5); 364.5-370.6 meters @ 1.29 gpt Au (FC17-6) and 163.4-164.6 meters @ 5.99 gpt Au (FC17-7). (resource = 2,050,000 tonnes @ 6.18 gpt Au indicated) *Press Release:* January 16

Contact Gold Corp. announced that recent drill results at the Pony Creek Project include 25.91-70.1 meters @ 0.34 gpt Au (PC17-21); 30.48-44.2 meters @ 0.32 gpt Au (PC17-23); 71.63-85.35 meters @ 0.33 gpt Au (PC17-25) and 140.21-163.07 meters @ 0.16 gpt Au (PC17-34). *Press Release:* January 16

Barrick Gold Corp. announced that it acquired an option to earn a 60% interest in the McCoy-Cove Property (less the Cove/Helen Deposit) from Premier Gold Mines Ltd. for \$22,500,000 in exploration expenditures over 4 years. *Press Release:* January 10

Premier Gold Mines Ltd. announced that it acquired an option to earn a 100% interest in the Rye Property (at Goldbanks) from Barrick Gold Corp. for \$3,000,000 in exploration expenditures over 2 years. *Press Release:* January 10

NuLegacy Gold Corp. announced that recent drill results at the Iceberg/Serena Project include 123.4-164.6 meters @ 0.76 gpt Au (SR17-06); 153.2-163.5 meters @ 5.96 gpt Au (SR17-08c); 219.5-253.0 meters @ 0.50 gpt Au (SR17-09) and 83.2-103.2 meters @ 0.25 gpt Au (SR17-14c). *Press Release:* January 18

Gold Standard Venture Corp. announced that recent drill results at the Jasperoid Wash Project include 13.7-68.6 meters @ 0.89 gpt Au (JW17-04); 27.4-57.9 meters @ 0.73 gpt Au (JW17-08) and 42.7-120.4 meters @ 0.48 gpt Au (JW17-10). *Press Release:* January 11

Corvus Gold Inc. announced that recent drill results at the Mother Lode Project include 126.49-172.21 meters @ 1.33 gpt Au (ML17-026); 124.97-156.97 meters @ 0.49 gpt Au (ML17-027); 73.15-124.97 meters @ 1.86 gpt Au (ML17-028) and 313.94-347.47 meters @ 1.60 gpt Au (ML17-031). (sulfide resource = 8,545,000 tonnes @ 1.57 gpt Au indicated) *Press Release:* January 18

Northern Empire Resources Corp. announced that recent drill results at the Sterling Project include 104.55-109.85 meters @ 16.52 gpt Au (STR17-032C); 68.88-70.1 meters @ 2.85 gpt Au (STR17-044C) and 109.91-123.99 meters @ 2.23 gpt Au (STR17-045C). (resource = 1,958,000 tonnes @ 3.61 gpt Au inferred open pit) *Press Release:* January 11

Coeur Explorations Inc. announced that it terminated its interest in the Quito Project of Bravada Gold Corp. *Press Release:* January 29

Coeur Explorations Inc. announced that it acquired an option to earn a 100% interest in the Tonopah West Property from Ely Gold Royalties Inc. for \$940,000 cash over 4 years. *Press Release:* December 5



## **WOMEN'S MINING COALITION 2018 FLY-IN – OUR 26<sup>th</sup> ANNUAL! April 22 – 26, 2018 Washington D.C.**

**CONSIDER JOINING US IN WASHINGTON DC FOR  
THE 2018 WMC FLY-IN.**

**WE HAVE LOTS OF WORK TO DO, EDUCATING THE  
MEMBERS OF CONGRESS ABOUT THE IMPORTANCE  
OF A ROBUST DOMESTIC MINING INDUSTRY.**

**SCHEDULING AND HOUSING DETAILS TO FOLLOW.**

**For more information, contact:**

## GSN Vests for sale

On December 6, 2017 the GSN celebrated its 60<sup>th</sup> Anniversary! To honor our 60 years as a society we are selling vests with a commemorative logo. We have men's, women's, and unisex. The fleece comes in dark gray, light gray and the women's cut is a 2 tone blue/black. The reversible fleece vest with waterproof material on the opposite side comes in navy blue only. The reversible vest has the logo embroidered on both sides. All fleece vests are \$60 and the reversible vest is \$70. Please email Laura at [gsn@gsnv.org](mailto:gsn@gsnv.org) to get yours today!



## ROCK TALK

### **Shifting Shorelines At Lake Tahoe Caused By Ancient Lava Dams**

(News Release from GSA—<http://www.geosociety.org/GSA/News/pr/2018/18-04.aspx>)

Boulder, Colo., USA: Pleistocene basaltic lavas form a small volcanic field that was erupted from seven vents in the northwestern Lake Tahoe basin. Most of these lavas were erupted above the water and produced lava flows that dammed the lake outlet and flowed into an early Lake Tahoe. The resulting steam explosions produced deltas composed of fragmental deposits as well as pillow lavas.

Consequently, three former raised shorelines are marked by subaerial lava flows overlying subaqueous lava deltas. In addition, eruptions from isolated vents on the lake floor produced tuff cones. Six new radiometric argon ages define three episodes when lava erupted subaerially and flowed into the lake. Lava from each of these cycles dammed the lake outlet in the Truckee River Canyon, causing the lake to rise nearly 200 m, after each of which the dams were eroded and the lake returned to near its present level.

The canyon was dammed at 2.3 million years ago (Ma), which raised the lake level from about 1896 m above sea level to 2048 m; again at 2.1 Ma, which raised lake levels from about 1914 m to 2073 m; and finally at 0.94 Ma, which raised lake level to 2085 m. These three raised shorelines indicate that the present outlet of Lake Tahoe through the Truckee River canyon has been operative for at least 2.3 million years.

"The timing of this repetitive volcanic activity raises implications for future volcanic eruptions and their hazards," says study co-author James Moore. "The lake could be dammed by lava again, causing extensive shoreline flooding as its level rose, or rapid dam failure could cause extensive downstream flooding along the Truckee River on its path to Reno."

**FEATURED ARTICLE: Pleistocene volcanism and shifting shorelines at Lake Tahoe, California**  
**Winifred Kortemeier, Andrew Calvert, James G. Moore (Contact Author: [jmoore@usgs.gov](mailto:jmoore@usgs.gov)), and Richard Schweickert;**  
<https://pubs.geoscienceworld.org/gsa/geosphere/article/527488/Pleistocene-volcanism-and-shifting-shorelines-at>.

GEOSPHERE articles are available at <http://geosphere.geoscienceworld.org/content/early/recent>. Representatives of the media may obtain complimentary copies of GEOSPHERE articles by contacting Kea Giles at the address above. Please discuss articles of interest with the authors before publishing stories on their work, and please make reference to GEOSPHERE in articles published. Non-media requests for articles may be directed to GSA Sales and Service, [gsaservice@geosociety.org](mailto:gsaservice@geosociety.org).

**GSN Member, DAVID ALEXANDER GLEN BENDING**



(December 12, 1954 - December 16, 2017) - David was born in Chicoutimi, Quebec on December 12, 1954 to Glenville Charles and Beatrice Elizabeth Long Bending. He spent his early years in Ontario and Vancouver, Canada before immigrating with his family to California in the 1960s.

He earned a B. Sc. Geology at the University of Oregon and a M.Sc. Geology and Geochemistry at the University of Toronto in 1983 where he had the good fortune to work under the supervision of professor Frank W. Beales. David then embarked on a successful career of international mineral exploration and development. He worked with major companies such as Rio Tinto, Texasgulf and was Latin America exploration manager with Homestake Mining from 1993 to 1998. He formed Gold Exploration Management, Inc. in 2010 and spent decades innovatively pursuing strategic mineral exploration and development throughout the world, particularly in the Americas. His resume points to significant discoveries in Latin America.

David was a critical thinker and he had a passion to succeed. He shared his passion for geology and inspired colleagues along the way with his dedication and enthusiasm to the industry. His history as an exploration geologist was characterized by his drive, his leadership and entrepreneurial spirit. Everyone who knew him would expect a memorable experience while on a field trip. His exploration journeys expanded well beyond regular work hours. He was also active in management and board functions for junior public companies in Canada and the US.

He became recognized by experts in the field for his ability to identify overlooked opportunities. His Pend D'Oreille Lead-Zinc thesis won the CIM President's Gold Medal Award in 1983 for the best thesis in Canada. He was a licensed Professional Geologist in British Columbia. He was also recognized in 2017 for 25 years of success and contributions to the profession by the Society of Economic Geologists.

David's predominant goal was to provide for his family. While work led him to travel extensively, he had his family accompany him overseas whenever possible. Many joyful and memorable experiences including a trip to Angel's Falls in Venezuela, back road trips in Mexico and several snorkeling adventures in various part of the world brought the family together. David loved the water; swimming, raising angel fish, snorkeling. While he was taken too soon, it is fitting that he spent his last day at sea enjoying his life-long passion - recreational fishing.

Family members fondly recall David's bold personality as a child and his feats of jumping higher than everyone else from the Rosedale bridge or body surfing through the Rosedale dam. David often recounted memorable stories of his time with cousins and family at Rosedale.

He is survived by his beloved spouse Ginette and his children Michael David Bending and Katherine Marie Bending; brothers Bruce Bending and Scott Bending and sister Barbara Dayes (Don Dayes). He also leaves behind half-brothers, step-siblings, nieces and nephews, cousins and many friends. David will be fondly remembered and greatly missed.

**A memorial service will be held March 24th, 2018 at 1:00PM at The Covenant Presbyterian Church, 6695 Mae Anne, Reno NV.** Contributions can be made in David's name to the [American Heart Association](#).

## Resources for Future Generations 2018

**RFG 2018, taking place June 16-21, 2018 in Vancouver (Canada), is the first international conference dedicated to the availability of resources needed to sustain future generations.**

Under the auspices of the International Union of Geological Sciences (IUGS), Resources for Future Generations 2018 will be delivered by the Canadian Federation of Earth Sciences (CFES), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), the Geological Association of Canada (GAC), and the Mineralogical Association of Canada (MAC). **Along with the support of 30+ Technical Partners, RFG 2018 will bring together a global community of industry, academia and government, to address issues related to energy, minerals, water and the earth. More than 5,000 delegates and 120 exhibiting companies are expected to participate.** For more information visit [www.rfg2018.org](http://www.rfg2018.org).



## OTHER UPCOMING EVENTS

**1 March 2018 Nevada Petroleum & Geothermal Society, Reno, Nevada monthly meeting.** Cocktails at 6:30 PM, Dinner at 7:00 PM, Ramada Reno Hotel; 1000 East 6th St., Reno NV 89512. **SPEAKER: Emma McConville, Graduate Student, Geologist, UNR, Reno, NV. TOPIC: Applications of the Play Fairway Analysis for Geothermal Systems in Crescent Valley, Eureka County, Nevada..** Please make reservations by Tuesday, Feb. 27th by using the following link: <https://www.123signup.com/register?id=hbfnt>

**3-7 March 2018 Prospector's and Developer's Association of Canada (PDAC) Convention.** Toronto, Ontario. Please visit the GSN in the new 40 ft wide "NEVADA" booth #6634 in the North Hall! The NV Division of Minerals has taken the lead to create an all Nevada booth where NDOM, NMEC, NBMG, BLM, NvMA can all be together. For more information or to register please click on this link: <http://www.pdac.ca/convention>

**5 March 2018 DREGS (Denver Region Exploration Geologists), Speaker & Topic To Be Announced.** Social 6 p.m., Presentation 7 p.m. at Berthoud Hall, Room 241, CO School of Mines, Golden. For more info. contact James Piper at [geopros@g.com](mailto:geopros@g.com)

**6 March 2018 Arizona Geological Society meeting, Speaker: Joe Wilkins, Jr. Presents - Piedras Verdes and Cuatro Hermanos, Sonora, Mexico - A Tale of Two Porphyries.** 6 p.m. to 9 p.m. at the Sheraton, 5151 E Grant Rd. (& Rosemont), Tucson, AZ For more info and online registration click on the link: [Joe Wilkins, Jr. Presents - Piedras Verdes and Cuatro Hermanos, Sonora, Mexico - A Tale of Two Porphyries](#) . Dinner closes on March 2nd.

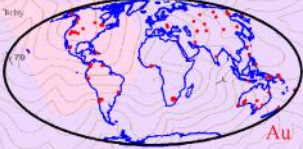
**12 March 2018 SME Northern Nevada Section Monthly Meeting.** Circus-Circus Mandalay Room, Reno NV. **Speaker and Topic To Be Announced.** Happy Hour @ 6 pm, Dinner @ 7 pm. Please contact Alex Wheatley for more information [NNevSME@gmail.com](mailto:NNevSME@gmail.com). You can pay dinner in advance at: <https://squareup.com/store/nnevsm>

**15 March 2018 AEG Great Basin Section Monthly Meeting.** Sure Stay Plus Hotel by Best Western, 1981 Terminal Way, Reno NV. **Speaker: Dennis Anderson, P.E., Principal Engineer. Title: "Revolutionary Geotechnical Technology".** Social Hour @ 5:30 pm, Dinner @ 6:30 pm, Presentation @ 7:00 pm. Please email Merrily Graham to RSVP at [mkgraham75@gmail.com](mailto:mkgraham75@gmail.com).


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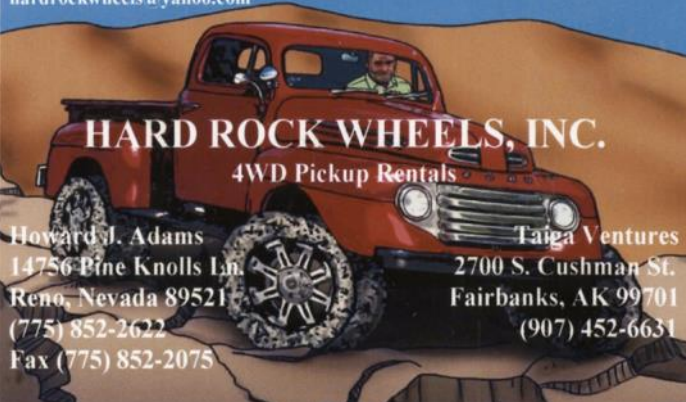
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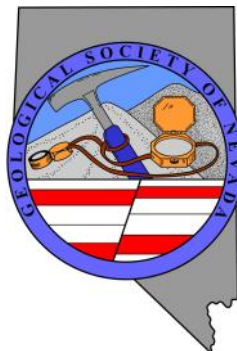
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