



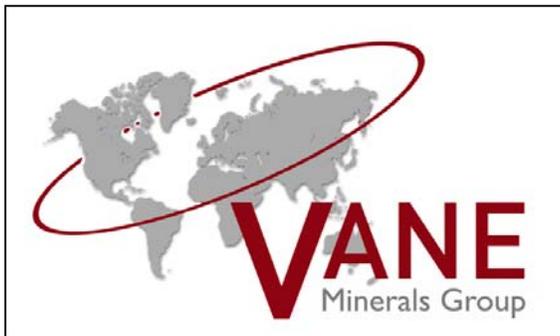
Arizona Geological Society Newsletter

JULY 2012

July 3, 2012 DINNER MEETING

- Who:** Dr. Tim Marsh will be our featured speaker. See abstract below.
- Where:** Sheraton Tucson Hotel and Suites, 5151 East Grant Road, (at intersection of Grant and Rosemont on the North side of Grant in the *CATALINA BALLROOM* (enter at northwest corner of the building) and follow the sign to the meeting room.
- When:** Cash Bar at 6 p.m.—Dinner at 7 p.m.—Talk at 8 p.m.
- Cost:** Members \$24, guests \$27, Students free with online reservation (\$10 without).

RESERVATIONS are REQUIRED: CALL 520.663.5295 by 5 p.m. by Friday, June 29 or reserve on the AGS website (www.arizonageologicalsoc.org). Please indicate regular (grilled salmon with chipotle honey glaze and rice pilaf), vegetarian, or cobb salad meal preference. Please cancel by Monday, July 2 at 8 a.m. if you are unable to attend—no shows and late cancellations will be invoiced. Meals for walk-ins may be available (with a \$3 surcharge), but cannot be guaranteed.



The July dinner meeting will be sponsored by VANE MINERALS GROUP. AGS is grateful to Vane Minerals for helping us to offset dinner meeting costs! Learn more about our sponsor at www.vaneminerals.com.

ABSTRACT

Geology of the Van Dyke Copper Deposit, Miami, Arizona

by Tim Marsh, President, Bell Copper Corporation

Beneath the streets of downtown Miami, Arizona is a historical inferred copper resource of 157 million tons grading 0.44% copper at a 0.15% cutoff as estimated in 1976 by Occidental Minerals Company. This estimate is historical in nature, it does not comply with NI43-101 standards, and it should not be relied upon. The deposit was originally discovered by Cleve Van Dyke, founder of the town of Miami, in 1916 when he drilled a 1900-foot churn drill hole on a ridgetop at the north edge of town, cutting copper oxides beginning at 1200 feet. A second churn drill hole 2000 feet deep located almost 1 mile to the east demonstrated that he was on to something big. Van Dyke's mine produced 12 million pounds of copper from 5% copper ore between 1929 and 1945. A modern effort by Occidental Minerals Company to develop the resource between 1966 and 1984 came to an end just when a favorable federal court decision ruled that Occidental had the right to extract ore from beneath the town, but copper prices had fallen too low to finance further work. Kocide Chemical Company in 1989 operated an in-situ mining operation on the site, producing 4 million pounds of cement copper for use as a fungicide in the Casa Grande cottonfields. Bell Copper began negotiations with the heirs of Cleve Van Dyke in March of 2010 and has signed a purchase agreement for the deposit scheduled to close this month.

Read about the speaker on page 2.

ABOUT THE SPEAKER

Tim Marsh is president of Bell Copper Corporation, a public Canadian copper exploration and development company striving to survive the next 12 months. He is a registered geological engineer in Arizona and has a PhD in ore deposits and exploration from Stanford University. He completed his bachelor's degree in geological engineering at Colorado School of Mines in 1986 and went straight to work for Robert Friedland at the Summitville Gold Mine, Colorado. He spent four years working in the Mohave desert at the Cactus Gold Mine, where he met and married his wife Marsha of the past 21 years (yes, she's really Marsha Marsh). After a five year stint at Stanford where he studied Homestake's El Hueso gold deposit and Anaconda's old Potrerillos deposit in Chile, he joined Lew Gustafson, Don Hammer, and Glen Zinn in AMT International Mining Company's effort to develop a high grade underground copper-moly mine at Copper Creek, Arizona. He helped put flowers on AMT's grave after a gullible CEO sent the company's funds to a Nigerian con artist. He joined Kennecott's effort at Resolution in 2001, became the first chief geologist of Resolution Copper Company in 2003, and took 1st place in the 2003 jackleg drilling contest in Superior after all of the real miners had left Magma for underground mines at Carlin and Stillwater. Tim left Resolution in 2005 to join Bell Copper Corporation as VP Exploration, where he has guided copper, gold, iron, nickel, and PGM exploration programs in northern British Columbia, northern Manitoba, northern Chile, southern Mexico, northern Michigan, and most important, Arizona. He lives in Tucson with his two adopted Chinese daughters and long-suffering wife, Marsha.

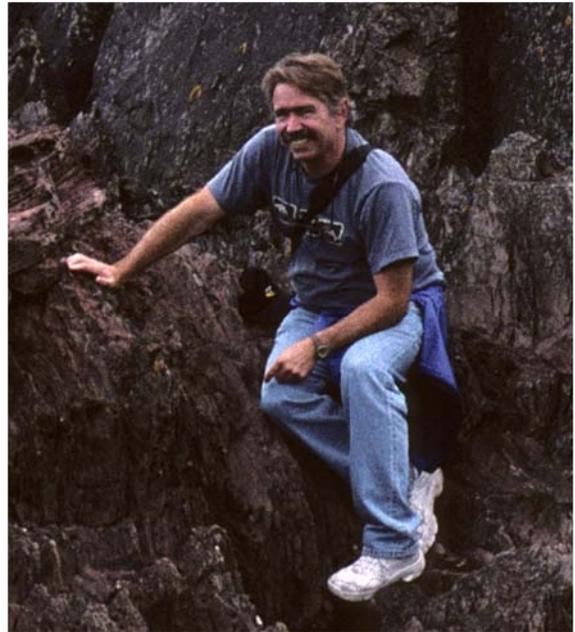
Field Trip Report

by Cori Hoag

Steve Reynolds, Professor of Geology at Arizona State University, will lead the joint AGS-AIPG Centennial field trip on Saturday, November 10 in the Dreamy Draw area of the Phoenix Mountains to examine aspects of Proterozoic evolution. In the afternoon, we'll head into the South Mountains to visit spectacular exposures related to mid-Tertiary extension.

Arrangements for a two-day trip to the Wickenburg area on October 6-7 are in progress. Bill Feyerabend, Independent Geologist, will lead a Vulture Mine tour on Saturday morning. Steve Reynolds and Jon Spencer, Senior Geologist at the Arizona Geological Survey, will take the group to stops in the Wickenburg area including along the Hassayampa River on Saturday afternoon. Arrangements are underway with catering companies to provide boxed lunches and dinner on Saturday. We are working with Cindy Thrasher, President of the Wickenburg Historical Society, for an after-dinner talk. Rick Edge, Senior Geologist at Uranium Energy Corporation, will lead a Sunday tour to the Anderson Mine. Details including pricing and hotel are still in the works. We plan to use personal vehicles for the trip. The Anderson Mine segment will require four-wheel drive vehicles.

Hall Stewart, VP of Exploration for Commonwealth Silver & Gold, has indicated that he is willing to provide a tour of the Commonwealth Mine (near Pearce-Sunsites) late in 2012 or early next year.



Structural geologist Steve Reynolds, professor at ASU, will be leading a joint AIPG-AGS field trip in November. He will also be one of the leaders of an AGS field trip in October. Steve is pictured here at the famous Siccar Point unconformity.

ANNOUNCEMENTS

Welcome New AGS Members

Karl Gist, Geotemps, Tucson, AZ

Jolene Faylor, HS International, Greenwood Village, CO

Richard Leisure, Pima County Sheriff's Office, Tucson, AZ

William Whitty, Freeport McMoRan Copper & Gold, Oro Valley, AZ

AGS is seeking sponsors for our monthly dinner meetings. Sponsorship helps to offset costs and is a great way to get the word out about your company or organization. For more information, please contact AGS VP of Marketing, Ann Pattison.

PROPOSED CHANGE TO AGS BYLAWS

In order to allow the AGS Executive Committee to vote on decisions that must be made quickly, the Executive Committee is proposing to amend the AGS bylaws. The membership will vote on this change to the bylaws at the July dinner meeting.

The proposed change will replace the third paragraph of Article III, Part 3 and will read as follows:

If the transaction of business requires approval prior to the next regular or special Executive Committee meeting, the transaction may be approved by electronic mail according to the following procedure:

1. *A motion shall be made by a member of the Executive Committee. The motion will include the reason why a decision must be made before the next scheduled Executive Committee meeting.*
2. *The motion must be seconded.*
3. *A minimum of three calendar days' discussion shall be allowed after the motion is seconded before the votes are tallied by the Secretary.*
4. *A majority of the members of the Executive Committee shall constitute a quorum for the transaction of business by electronic mail.*
5. *The Secretary will report the decision taken and tally of the votes in the minutes of the next regularly scheduled Executive Committee meeting.*



Random filler photo of the month:

Dr. Stanley Beus discusses the basal conglomerate of the Esplanade Formation (Supai Group) at North Canyon in the Grand Canyon.

How Much Water is Available?

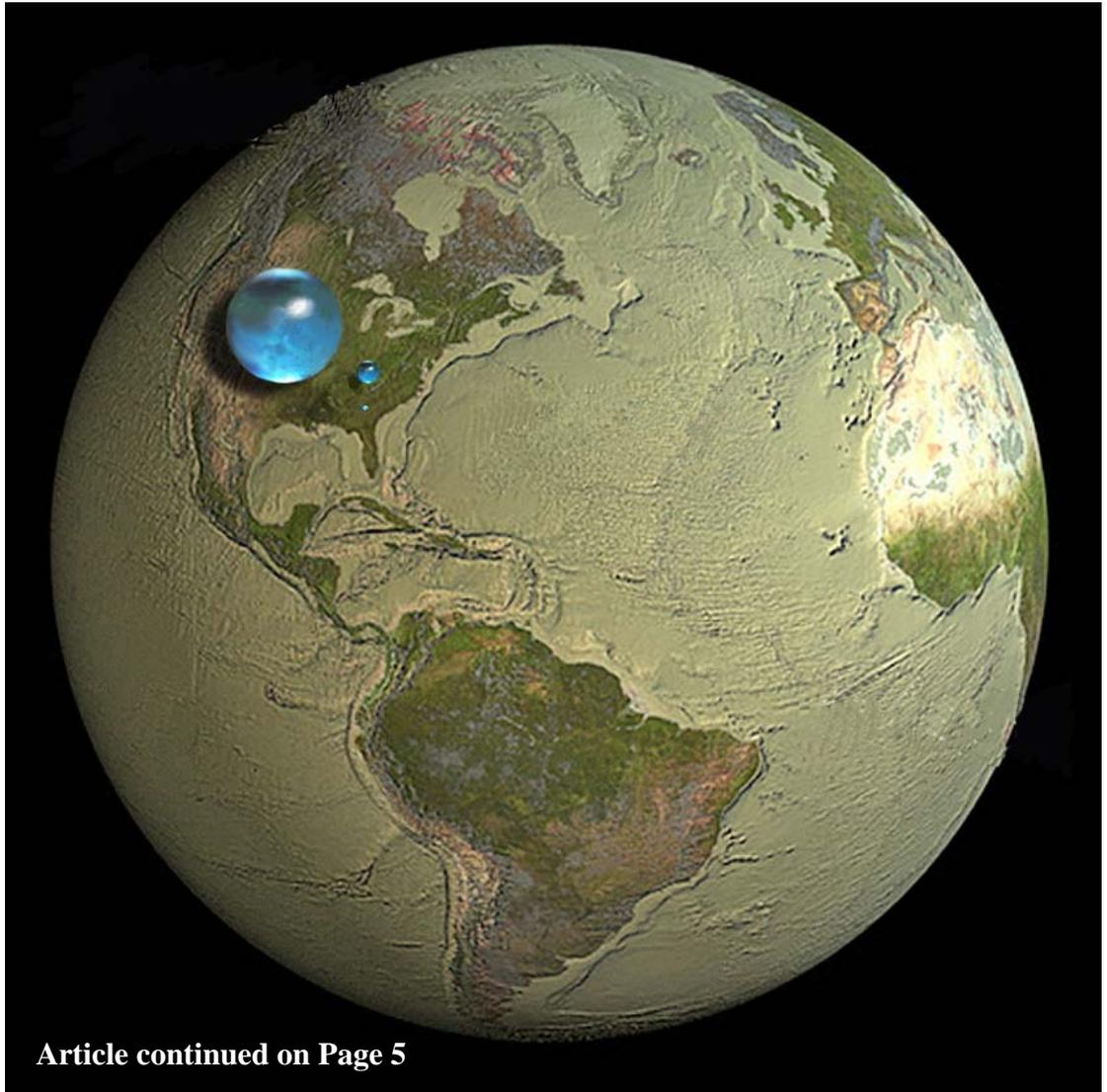
This article by the U.S. Geological Survey is reprinted from the USGS blog. You can see the entire blog posting at: http://www.usgs.gov/blogs/features/usgs_top_story/how-much-water-is-available/?from=textlink%20

If you took all the water on earth—in oceans, ice caps, lakes, rivers, groundwater, the atmosphere, and living things – and wrapped it into a sphere, it would have a diameter of about 860 miles. That 860-mile-high sphere is represented by the largest bubble in the picture, which stretches from Salt Lake City, Utah to Topeka, Kan. It has a volume of over 332 million cubic miles. If you popped this bubble with a giant pin, the resulting flow would cover the lower 48 states to a depth of about 107 miles.

In reality, most of the largest bubble is stretched over about 70 percent of Earth's surface, a very thin layer over the land. As we stare out into them, we think of oceans as vast expanses. And in many parts of the world we feel water-rich, even as we hear stories of regions where water is far from abundant. This graphic shows that this amount of water is not nearly as abundant as it may feel. Furthermore, most of this water is unusable to humans, because we need freshwater to survive, and 98 percent of that large bubble is saline.

The much smaller blue sphere over Kentucky—by comparison, about 169.5 miles in diameter—represents the world's liquid fresh water, including groundwater, lakes, swamp water, and rivers. However, 99 percent of that bubble is groundwater, much of which is not accessible to humans.

Now we can start to answer the question, *how much water is available to humans?* Do you notice that tiny blue speck over Atlanta? That's the bubble



Article continued on Page 5

How Much Water is Available? Continued from Page 4

representing fresh water in all the lakes and rivers on the planet. Most of the water that people and ecosystems need every day comes from these surface-water sources. The diameter of this sphere is a mere 34.9 miles, with a volume of a little over 22,000 cubic miles. The sphere looks tiny compared to, say, the Great Lakes region, which is the largest freshwater source on Earth. But keep in mind that tiny dot is about 35 miles high.

In 2005 Americans used about 328 billion gallons of surface water and about 82 billion gallons of groundwater per day. Surface water is used as the primary supply of drinking and irrigation water, but groundwater is used for these purposes too. Groundwater is also vital in keeping rivers and lakes full, and it provides water for people in places where visible water is scarce, such as in the desert towns of the western U.S.

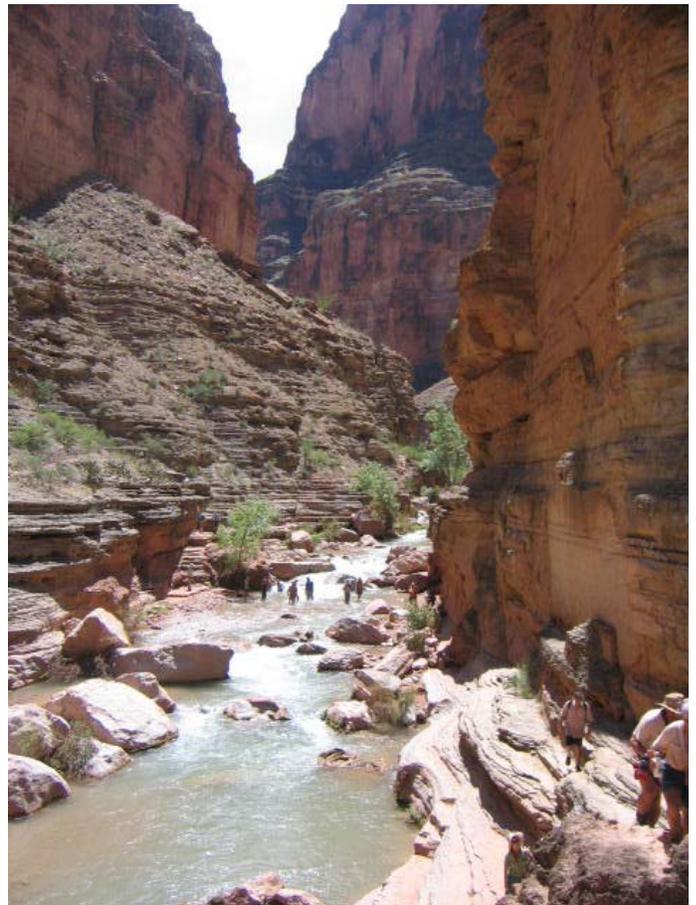
Still—look again at the picture. It doesn't seem like a lot of water! Certainly, it's not. It's important to remember that water is a precious resource. It's never sitting still; it moves between the air, the land, underground, to the ocean and back again via the water cycle. USGS scientists conduct studies to understand how much water is available now and for the future, including how water flows through the water cycle, how surface water and groundwater interact, and how the quality of our water impacts availability. These studies are important for wise water use, especially as the world becomes increasingly water stressed.

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Grand Canyon Geology Raft Trip—2013

Alison Jones is planning a Grand Canyon Geology Raft trip on July 29-August 5, 2013 with Hatch River Expeditions as the outfitter. Although the trip is geology-oriented, it is NOT just a trip for geologists. Please call Alison at 520-622-3222 or email her at ajones@clearcreekassociates.com for more information.

Photo at right: Hiking up Havasu Creek, one of the many wonderful hikes we'll be doing on the trip.



Need Topos?

The days of paying for topographic maps may be over. According to the USGS, "US Topo is the new generation of digital topographic maps from the USGS. Arranged in the traditional 7.5 minute quadrangle format, digital US Topo maps look and feel like the traditional paper topographic maps for which the USGS is so well known. At the same time, US Topo maps provide modern technical advantages that support wider and faster public distribution and enable basic, on-screen geographic analysis. US Topo maps are available free on the Web through the USGS Store."

Check out this link for the full story: <http://nationalmap.gov/ustopo/index.html>

How US Topos Differ from Traditional USGS Topographic Maps:

- Made from nationally consistent data that are quality assured to high standards.
- Downloadable free from the USGS Store.
- Free downloadable user tools.
- Selectable reference systems:
 - Latitude-Longitude.
 - UTM (Universal Transverse Mercator).
 - MGRS (Military Grid Reference System).
- Interactive capabilities with Google Maps®.
- A planned 3-year revision cycle, facilitating incorporation of additional data layers.

2012 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

Please mail check with membership form to: Arizona Geological Society, PO Box 40952, Tucson, AZ 85717

Dues (check box) 1 year: \$20; 2 years, \$35; 3 years: \$50; full-time student (membership is free)

NEW MEMBER or RENEWAL? (circle one) Date of submittal _____

Name: _____ Position: _____

Company: _____

Mailing Address: _____

Street: _____ City: _____ State: _____ Zip Code: _____

Work Phone: _____ Home Phone: _____

Fax Number: _____ Cellular Phone: _____

E-mail: _____ Check this box if you do not have an email address

All newsletters will be sent by email. If you do not have an email address, we will mail a hard copy to you, but we cannot guarantee timeliness.

If registered geologist/engineer, indicate registration number and State: _____

Enclosed is a _____ tax-deductible contribution to the J. Harold Courtright Scholarship Fund.