

The Geologic Division Retirees Newsletter



An organization of retirees of the Geologic Division, U. S. Geological Survey, who seek to keep in touch with each other and with their former Agency.

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About the cover: for many years, Reston Pick & Hammer Club produced an annual April Fool's Day tableau. These were mostly named for various Directors. In 1986, Penny Hanshaw managed to "borrow" Dallas Peck's pickup truck, and we went to a horse stable where we filled it with manure (aged). We then parked it in front of the National Center and assembled a cast of celebrants for a theme satirizing Dallas's well-known gardening obsession. When we finished the photo, Dallas insisted on taking the fertilizer home with him, rather than having it returned to the stable. The cast from left to right: Gene Robertson, Paul Hearn, Carolyn Buck Harrison, John Keith, Don Kelly, Dallas, Kathleen Gohn, Elliott Spiker, Bruce Lipin, and Penny Hanshaw. Photo by Dave Usher.

From the President

Many of you will recall that we formerly had special Civil Service rankings for scientists of particularly outstanding accomplishments. These were the “supergrades” of GS-16, 17, and 18. In the Civil Service reform of 1990, these positions were discontinued, and they were replaced by Scientific and Professional Positions ST and SL, as part of the Senior Executive Service. I recently asked Rama Kotra, Associate Director of the Office of Science Quality and Integrity, for an update on the use of these positions in the Survey. His reply follows:

USGS research scientists typically can expect to achieve the highest rank in the General Schedule series (GS-15). If the scientist is found to be working at a level beyond GS-15 by a panel of peers, she or he may then compete for an ST position. For a long time the USGS was allowed to have 48 ST-level scientists on board. Clearly the number of ST slots given to the USGS was insufficient. The Survey requested the Department of the Interior (DOI) and the Office of Personnel Management (OPM) for an increase in ST slots. The solid reputation of the USGS as a premiere science agency in the government, as well as the excellent reputation for applying the OPM’s Research Grade Evaluation Guide (RGE) successfully with a high level of rigor and thoroughness over many years to review its scientific staff, led to the recent granting of 12 new ST slots.

As of Sept. 2014, there are 544 total ST positions in the Federal government. The DOI has 60 of them (~11%), all at the USGS. For comparison there are 7190 Senior Executive positions in the government. Potential ST candidates are initially identified by the RGE review process. Nominees from this process are further reviewed by the USGS Senior Scientist Review Panel (SSRP). The SSRP recommends to the Director of the USGS which scientists merit the ST rank. The Director then makes the final selection. The most recent SSRP meeting was in February 2014. The Director has selected a new set of ST scientists, and the names of the new group of STs are to be announced in the near future. The ST rank is the highest rank that a Federal scientist can aspire to. Along with the high recognition come a number of

important responsibilities including serving as a role model and mentoring newer scientists.

It’s greatly encouraging that the reputation of the Survey for producing unbiased, high-quality science has been sustained and that individual scientists are being appropriately recognized for their significant accomplishments.

Just before we went to press, Acting Director Suzette Kimball announced the names of 14 new STs. The following list contains more biology promotions than geology or water because they were not part of previous reviews, so this round is a catch-up for them. Geology: David Houseknecht and Tom Parsons; Water: Mike Dettinger, David Krabbenhoft, Greg McCabe, and Ward Sanford; Biology: Don Deangelis, Jim Grace, Sue Haig, Chris Ingersoll, Jon Keeley, Kevin Lafferty, Dave McGuire, and Jim Winton.

John Keith

Treasurer’s Report and Membership Statistics

This report summarizes the financial situation of the Geologic Division Retirees as of the end of 2014. Our present financial health is excellent because we have found a printer for our newsletters and directory who does a good job at a much lower cost than our former printer. In addition, we printed only one newsletter in 2014, so our expenses were very much lower than usual. We currently have a large surplus and added to that surplus during 2013 and 2014, even though we decreased dues to \$6. At current levels of expenses, the current surplus could fund the organization for four or five years - this seems too large a surplus for a non-profit organization like ours. If the surplus continues to grow, we will have to decrease dues further, but for the present, we are leaving dues at \$6 per year.

Net worth, January 1, 2014	11,343.28
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2014 Income

Dues and contributions received	
Dues for 2013 and prior years	244.00
Dues for 2014	1,250.00

Dues for 2015 and beyond	712.00
Contributions	695.00
Total income	2,901.00
2014 Expenses	
Dues notices (envelopes, stamps, labels)	323.71
Preparation and mailing of newsletter and directory	1,588.72
Bank charges	6.00
Total expenses	1,923.43
Net change in net worth	977.57
Net worth, December 31, 2014	12,320.85
Assets, December 31, 2014	
Checking account, Wells Fargo	12,300.85
Undeposited dues & donations	20.00
Total assets	12,320.85

Notes:

Comparison with 2013: The amount received for dues in 2014 is \$86 less than in 2013, and the amount received as contributions is \$186 greater. Dues billing cost \$65 more (this cost varies considerably from year to year because of advance buying of envelopes and labels in some years).

Escrow for future dues: Of the assets at the end of 2014, \$1170 represents advance dues payments and must be regarded as funds in escrow for 2015 and future years.

Dues billings: For 2015, dues notices were sent out in a single batch. Members who have not paid dues since 2012 will be dropped from the active membership list if they do not pay within a few months of receiving the 2015 dues notice. They will no longer receive newsletters and their names will no longer be listed in the directory.

Membership statistics:

At the end of 2014, we had 390 members (compared to 579 at the end of 2004, 555 at the end of 2005, 531 at the end of 2006, 519 at the end of 2007, 504 at the end of 2008, 484 at the end of 2009, 453 at the end of 2010, 434 at the end of 2011, 414 at the end of 2012, and 407 at the end of 2013). Since 2004,

we have had an average annual net loss of 19 members. Of our members at the end of 2014, 61 were in arrears, 235 were paid up through 2014, and 91 were paid up through 2015 and beyond; 3 are life members. All members who have not paid dues since 2011 have been dropped from the active membership list. About 100 of our members are currently Emeritus geologists with the USGS.

Odette James

New Members

Judy Back
Michael Brownfield
Jim Calzia
Tom Casadevall
Gary Dixon
Larry Drew
Kathleen Gohn
Karl Kellog
Roy Kepferle
Sue Marcus
Christine Murphy
Gail Wendt

Essays, Anecdotes, and History

Airplanes Down in the Sierra

James G. Moore

The towering east face of the southern Sierra Nevada, an unbroken wall extending 100 miles from Yosemite to Mount Whitney, has always been a barrier to travel. It is marked with twelve 14,000-foot peaks and nearly all the passes are more than 11,000 feet high. This ridge is a challenge to aircraft, and many planes have crashed in the alpine peaks. Here are the stories of some of those that we found during geologic mapping in the 1960s and 1970s.

Hester Lake In July 1960 Frank Dodge and I backpacked into LeConte Canyon to map the east side of the craggy Black Divide, a mass of metamorphosed volcanic rock that extends north to the summit of

Mount Goddard. Leroy Brock, a seasonal backcountry park ranger stationed near the Muir Trail, asked to accompany us on this traverse that entailed a climb of more than 3,000 feet. He appeared early next morning for a cup of coffee as we made up our packs for the day. Frank, Leroy, and I hiked up a creek gorge, passed some crystal-clear glacial tarns, and stopped often to take geologic readings and samples. After a stiff climb, we reached a then-unnamed lake at 11,255 feet, partly frozen on the far side. As we knelt at the lake outlet for a drink, I noticed two objects that had floated and lodged among the rocks. One was a large wooden wedge, an aircraft wheel chock, and the other was a small metal cylindrical pressure tank of the type used for breathing oxygen in aircraft. These items signaled that a plane had crashed in or near the lake. We circled the lakeshore toward the north, mapping the geology, but suddenly spotted an open parachute submerged in shallow water. I took off my boots and pants, waded into the freezing lake, and grabbed the white fabric. The chute was rotten and ripped and tore as I tried to pull it free. Soon after, Frank spotted a boot in about 6 feet of water. Despite goosebumps from the cold water, I stripped down completely, dived into the water, grabbed the boot, but could not bring it to the surface because of cords attached to it. I dove again with a knife, cut the cords, and tossed the boot onto the rocky shore. It was a flight boot that contained a human foot, broken off at the ankle. The cords proved to be insulated wires that apparently were part of an electric system that heated socks for warmth. The skin of the foot, though slightly wrinkled and bleached, was otherwise almost perfectly preserved as was the hair and flesh. It took some minutes for the shock of this grisly discovery to subside. Our first reaction was that we were dealing with a crash a year or two old. The remarkable preservation could be attributed to the fact that the lake is frozen much of the year, and its waters remain

near freezing during the summer. Before long we found a weathered leather briefcase 30 feet upslope from the water's edge. Papers within, though caked with mud and barely legible, revealed that they had belonged to the navigator of a B-24 bomber, the four-engine World War II Liberator. Further climbing revealed part of a shattered tail assembly on a high ridge southwest of the lake. We surmised that the plane had come in over the ridge a bit low, had struck a rocky spur at nearly 13,000 feet, and then cartwheeled down into the frozen lake. Most of the plane had sunk in deep water, but some objects were torn loose and skated across the ice to end up in shallow water or up on the sloping bank. We returned the boot to the lake, took the papers from the briefcase, and noted the inscriptions on other small pieces of the aircraft. My mind was not on geology that afternoon as we descended another drainage to camp.

On July 28 the packer arrived and we camped near the LeConte Canyon ranger station in preparation for packing out the next day over Bishop Pass. That night around the campfire we got the story from Leroy Brock, who had radioed park headquarters. The plane had been on a training flight during World War II on December 5, 1943. It had departed Hammer Field near Fresno, flew to Tucson, and disappeared on its return flight, as it encountered bad weather crossing the high Sierra. No trace of the plane had been found until our discovery. It was then that I realized with a shudder that a 16-year old packer's helper sitting with us at the campfire had not yet been born when the foot had been torn from its owner. We later learned that Clinton Hester, the father of copilot Lieutenant Robert Hester, had become obsessed with searching for the plane and his son. He spent every summer season combing the vast reaches of the high Sierra. He traveled from one trailhead to another by motorcycle and then searched the trails on foot. This passionate search was not

successful. Eventually he died in 1959, just a year before we discovered the plane. The plane had been in the water at this remote spot for nearly two decades, a place that was apparently unvisited by anyone during that time. The lake was subsequently named Hester Lake on the U.S. Geological Survey 7.5-minute North Palisade Quadrangle.

East of Charybdis Backpacking out from our horse camp in July 1961 we made a spike camp at Chasm Lake at the head of the Enchanted Gorge south of Mount Goddard. At 11,000 feet just east of Charybdis, we worked up a glacial valley containing small meadows and lakes. The steep-walled glacial valley was carved in a red-brown metamorphic rock. It was step-like with flat-floored meadowy stretches or treads interrupted by 50- to 100-foot rocky cliffs or risers. After we had climbed one cliff and were walking up the gentler terrain, Frank pointed to a shining spot at the base of the next cliff. It appeared to be the reflection from a piece of metal. As we approached it, I could make out the crumpled remains of a single-engine airplane. Most of the wreckage was maroon with yellow trim, colors that blended in with the reddish metamorphic rock. A plate on the engine identified the plane as a Stinson H Station Wagon, with wing number NC723C. We surmised that the pilot had been in trouble and had attempted an emergency landing in this rocky and desolate place. Spotting the high valley and deciding to attempt a crash landing up valley on the relatively flat floor, the pilot overshot the flat terrain and struck the next riser. The wreckage fell back to the cliff base. Human remains, including arm, leg, spine, and pelvic bones, were scattered about. A variety of other items were noted including a camera case, cosmetics, embroidered tablecloths, girdle, gray flannel slacks, a white dress, and broken glass cooking ware. Judging by some of the gift-like items, we guessed that this might have been a bridal couple going to Las Vegas for their wedding. The actual story was more bizarre.

After reporting this finding to park authorities, we learned that the plane had been found previously, but that the site had not been sanitized yet because of its remoteness. Ted (Cedric) Norbury was one of two Stanford geology students (my classmates) killed in the crash. Ted was an ex-Navy pilot, and flew commonly with a reserve unit. He was engaged, and during the 1950-51 Christmas-New Year's holiday, he and his fiancée took off in the Stinson for Phoenix, AZ, the bride's home, for the wedding. Ted's geology classmate went with them, to serve as best man. When they never arrived, it became apparent that the plane was down in the mountains, and a search was launched that included flights by Norbury's colleagues in his Naval Reserve unit. A week was spent looking for the lost plane, but new snow covered everything, and the wreckage was not found. When I checked the 1951 Stanford Yearbook showing the School of Mineral Sciences seniors, I found Norbury's photograph on page 91, with my picture just two inches away. It was a chilling revelation that made this discovery especially disturbing.

Mount Williamson In 1976, helicopter time became available for geologic mapping of the John Muir Wilderness Area, which includes the two-mile-high east escarpment of the Sierra near Independence. The strategy was to drop a geologist high up in a canyon each morning so he could spend the day on foot mapping and sampling downhill. This permitted us to cover more than three times the distance that would be possible if we had to hike both up and down each canyon. On July 19, 1976, the helicopter dropped me on the south slopes of Mount Williamson and Ed du Bray, into the southern tributary of George Creek. I came upon an airplane that had struck an east-facing rock wall just 100 feet below the ridge crest at 12,000 feet. It was lodged between two granite towers. Could this be a case of a faulty altimeter in cloudy weather, or a plane that somehow

lost power at the last minute when a turn was impossible? The plane was shattered and in pieces. It proved to be a single-engine Vultee B-13 Valiant, an Air Force two-seater trainer manufactured from 1930 to 1942. I collected a partly opened, rotted parachute, skull fragments and vertebrae and put them in a sample bag. Later that evening we gave the remains to the sheriff in Independence, but I never heard more about this discovery.

Symmes Creek On another day that summer we flew into the head of the North Fork of Bairs Creek where I was dropped at 10,800 feet. Ed was put down two creeks to the north at Symmes Creek. While working down this creek in rugged trailless terrain, he came across the high heel of a woman's shoe. Some miles below, still on the creek, he found a pair of completely tattered and worn tan-colored women's high-heeled dress boots, one without a heel. When we took these items to the Inyo County Sheriff, he looked at the boots and knew the story. A plane with one man (the pilot, a veterinarian) and two women had crashed the previous April just west of the Sierra crest in Center Basin south of Mount Bradley (13,289 feet). One woman and the man did not survive the bitterly cold night following the crash, but the injured woman was able to hike out against formidable odds. Fortunately, she did not go west downhill from the crash site. That would have meant a hopeless struggle over tens of miles of snowy alpine country. Instead, she climbed over the Sierra Crest at about 13,000 feet. Seeing the highway and habitations of Owens Valley 9,000 feet below, she decided to descend the east face of the Sierra. She climbed hundreds of feet down the steep headwall using the heels of her boots to punch steps in the icy snow and inch from one outcrop to the next. Below the heavy snow, she gained the headwaters of Symmes Creek and worked down the stream gorge. After her boots wore out, she did the last several miles barefoot and reached the streets of Independence after dark.

While preparing this essay in December 2014, I came across two books on Sierra downed aircraft. *Final Flight* by Peter Stekel reports on a military plane down on Mendel glacier. Stekel is currently working on a book *Beneath Haunted Waters* on the Hester Lake B-24 episode. Lauren Elder told the story of the Center Basin crash and her remarkable hike out of the Sierra in her book *And I Alone Survived*. I have recently received from her a stylized painting of one of the tattered boots she wore out.

In the Footsteps of A. H. Brooks

Jack Reed

In 1902 Alfred H. Brooks led one of the epic traverses of the early geologic and topographic exploration of Alaska by the Survey's nascent Alaska Branch. His party of 7 men and 20 horses left tidewater at the head of Cook Inlet on June 2, crossed the Alaska Range at Rainy Pass (which he named), skirted the northwest flank of the Alaska Range eastward to the Nenana River (then called the Cantwell), followed the river north to the Tanana, and reached the village of Rampart on the Yukon on September 15. On the journey of 800 miles over rugged and unexplored terrain the party carried out topographic and geologic mapping that remained the basis for later more detailed studies for nearly half a century. During the course of their exploration, D.L. Reaburn, topographer for the party, made the first reliable measurement of the height of Mount McKinley. His figure of 20,300 feet was accepted for more than 50 years; the currently accepted height is 20,237 feet based on radar altimetry more than a century later. On August 3 the Brooks party made their closest camp to the mountain, near the head what is now called Slippery Creek, about 13 miles northwest of the mountain. In an account of his journey Brooks (Jour. Geography v.2 no 9 Nov. 1903) wrote as follows:

"The next morning dawned clear and bright. Climbing the bluff above our camp, I

overlooked the upper part of the valley, spread before me like a broad amphitheatre, its sides formed by the slopes of the mountain and its spurs. Here and there glistened in the sun the white surfaces of glaciers which found their way down from the peaks above. The great mountain rose 17,000 feet above our camp, apparently almost sheer from the flat valley floor. The dome-shaped summit and upper slopes were white with snow, relieved here and there by black areas which marked cliffs too steep for the snow to lie upon.

A two hours' walk across the valley, through several deep glacial streams, brought me to the very base of the mountain. As I approached, the top was soon lost to view; the slopes were steep and I had to scramble as best I could. Soon all vegetation was left behind me, and my way zigzagged across smooth bare rocks and talus slopes of broken fragments. My objective point was a shoulder of the mountain about 10,000 feet high, but at three in the afternoon I found my way blocked by a smooth expanse of ice. With the aid of my geologic pick I managed to cut steps in the slippery surface and thus climbed a hundred feet higher; then the angle of the slope became steeper, and as the ridge on which the glacier lay fell off at the sides in sheer cliffs, a slip would have been fatal. Convinced at length that it would be utterly fool-hardy, alone as I was, to attempt to reach the shoulder for which I was headed, at 7,500 feet I turned cautiously retracing my steps, finding the descent to bare ground more perilous than the ascent.

I had now consumed all the time that could be spared to explore this mountain which had been reached at the expense of so much preparation and hard toil; but at least I must leave a record to mark our highest point. On a

prominent cliff near the base of the glacier, which had turned me back, I built a cairn, in which I buried a cartridge shell from my pistol, containing a brief account of the journey together with a roster of the party.

By this time I was forcibly reminded of the fact that I had forgotten to eat my lunch. As I sat resting from my labors, I surveyed a striking scene. Around me were bare rock, ice and snow; not a sign of life--- the silence broken now and then by the roar of an avalanche loosened by the midday sun, tumbling like a waterfall over some cliff to find a resting place thousands of feet below. I gazed along the precipitous slope of the mountain and tried to realize again its great altitude, with a thrill of satisfaction at being the first man to approach the summit, which was only nine miles from where I smoked my pipe. No white man had ever reached the base, and I was far beyond where the moccasined foot of the roving Indian had never trod. The Alaskan native seldom goes beyond the limit of smooth walking and has a superstitious horror of even approaching glacial ice."

In the summer of 1954 I was attached to a topographic party that was establishing control for the 1:63360 quadrangle maps of the Mount McKinley area and was able to commandeer their helicopter in odd moments to go out and look at rocks. Grant Pearson, the superintendent of the Mt. McKinley National Park, had just finished writing a history of the Park and had come across the above quotation. He was extremely anxious to locate the cairn and recover the record that Brooks had left. Since I planned to visit the Slippery Creek area by helicopter, we decided to join forces and combine a quick geologic reconnaissance with a search for the cairn. We realized that locating a single cartridge shell on the slopes of Mount McKinley was the proverbial

problem of finding a needle in a haystack. However, we had several clues to go on. The location of Brook's camp of Aug. 4 is shown on the map that accompanies his official report (USGS Professional Paper 70). Several photographs bearing this date and apparently taken where he built the cairn appear in his other publications. His description of his route, although incomplete, further served to narrow the field. Last, and most important, we assumed that the route he would have taken would correspond closely with the route that anyone experienced in the mountains would have selected under similar circumstances. After careful stereoscopic study of the aerial photographs we selected two areas near the head of Slippery Creek that seemed the most likely places to search. The first of these was at the foot of a steep glacier-covered ridge just west of the glacier that lies at the head of the west fork of Slippery Creek---which for lack of a better name we called the "Slippery Glacier." The second was on a prominent bare ridge about three miles east of the glacier. On July 7th we were landed at an altitude of about 5,400 feet on the "Slippery Glacier." Setting up our camp near the middle of the glacier, we immediately set out to search the ridge to the west. At the time we considered this the most likely location, as it seemed to offer the most direct route to the only 10,000-foot ridge on Brooks' map, and it was indeed blocked by a smooth expanse of ice that would have been an insuperable obstacle without the aid of crampons and ice axe. After searching unsuccessfully for several hours we returned to camp in time for our evening radio schedule with the Survey camp at Wonder Lake.

The next day, July 8th, we turned our attention to the eastern ridge. Traversing the area west of the "Slippery Glacier" at about the 7,000-foot level, we spent several hours searching minor ridges and spurs, and at about 2 pm reached the second ridge we had picked on the photos. Although this ridge was not ice-covered, it had obviously been overridden in the

very recent past by ice from a small glacier lying just to the east. After a search of about half an hour, we located the cairn on the north end of a prominent erratic boulder at an elevation of about 6,500 feet on the ridge crest. The boulder was a rectangular block of granite about 15 feet long and 5 feet wide; the cairn consisted of four or five small rocks piled over a small hollow on top. It contained a brass cartridge shell sealed with clay and wrapped in a cloth tobacco sack (Maryland Club Mixture). Since the cairn had been erected, at least an inch of moss had grown between the rocks. When we removed the clay we found that the shell contained a badly water-soaked piece of paper which we made no attempt to remove. After replacing Brooks' note with one of our own, which we placed in a waterproof film can, we rebuilt the cairn and returned to camp to report our success to Wonder Lake.

The National Park Service sent the shell to the National Archives, where experts removed the note. It proved to be a standard Geological Survey specimen label with Brooks' name written on the back in pencil. There was no brief account of his journey or roster of his party. The cartridge shell, note, tobacco sack and a specimen of the moss was returned to the Park, where they were displayed for many years as mementos of Brooks' climb. However, they are not displayed in the new Park museum and apparently reside in some black hole unknown to the current Park staff. *(This article is a slightly revised version of the original article, which appeared in the American Alpine Journal, v. IX, no 4, 1955. It is sobering to realize that the length of time between Brooks' construction of the cairn and its recovery is less than that between its recovery and the time at which I write this. There have been several unsuccessful attempts to recover the cairn and our note. Study of the Mt. McKinley A3 topographic map and the Google Earth imagery indicate that the cairn*

is probably located near 63.1746°N, 151.1644°W at an elevation between 6500 and 6600 ft.)



(Jack in his Reston office, 1975.
Photo by John Keith)

**Applying Geology to Directly Help People in Need:
Bob Schuster's Experience with the Bairaman
River Landslide Dam, Papua New Guinea, 1986**
(Abstracted from Bob's article in the *Cross Section*,
Sept., 1986)

On May 11, 1985, a magnitude 7.1 earthquake occurred on the island of New Britain, Papua New Guinea, and caused extensive landsliding over a large area. One of the largest landslides created a lake on the Bairaman River in mountainous jungle about 40 km upstream from the river's mouth at the Solomon Sea. By October the lake was more than 3 km long, and the lake volume was estimated at 75 million cubic meters. Possible failure of the landslide dam threatened the lives of about 250 people in a village

near the mouth of the river. The Geological Survey of New Guinea (PNG) decided to conduct a "controlled" failure of the dam using explosives, and they requested Bob's help in monitoring stability of the dam and planning the event. The government had evacuated the downstream inhabitants of the area, but was having difficulty keeping them from returning as time passed. Bob arrived in PNG offices in Rabaul on Sept. 8th and then traveled with four staff by helicopter to the area of the dam. He and PNG Chief Geologist Jonathan King arranged for the setting of 100 kilograms of charges on the crest of the dam, then they removed to a safe area on the valley wall to observe. When the explosives were detonated on Sept. 11, they reduced the height of the dam a few feet but did not cause it to fail. The crest was then further lowered by hand labor to within 1 meter of the water. There was continual rain, as much as 10 inches per day, throughout these operations that made work difficult and visibility poor. On Sept. 12, due to increased lake level, overtopping of the dam began at about 7 a.m., and a natural spillway developed, eventually estimated to be as much as 100 meters deep. Maximum flow occurred about 9 a.m., and the observers checked each half hour with a PNG radio operator near the downstream village of Bairaman. They warned him of the coming flood, and at 9:30 he said, "The wall of water just passed, I've got to get out of here!" Bob was very worried that the operator had drowned, but found later that he and the villagers had all survived. By 5 p.m. about 80% of the water had drained from the lake, and the observers were able to photograph extensive secondary landslides and other features of the drained lake. This information, along with Bob's extensive notes on other aspects of the whole process, was a valuable addition to his knowledge of landslide dams. The old village site had been totally obliterated, as the flood height was about 10 feet at the village. The villagers were appreciative of the work by the PNG and Bob, and, as he was an intriguing "foreigner," wanted their picture taken with him. The original caption in the *Cross Section* was "Bob Schuster, third from right."



Observation in retiree paper on the San Andreas Fault provided material for popular science publications—Chet Wrucke

In 2013 Chet Wrucke, retiree of the old Branch of Western Mineral Resources in Menlo Park, and two non-Survey colleagues had a paper published on revisions to the location and movement history of the 1906 rupture of the San Andreas Fault in the nearby town of Portola Valley (Wrucke, C.T., Wrucke, R.T., and Sayre, Ted, 2013, Reassessment of the 1906 San Andreas Fault rupture in Portola Valley, California, from synthesis of Lidar and historical data: Bulletin

of the Seismological Society of America, v. 103, p. 2404-2413). The authors were surprised – and pleased – to learn that an observation in their paper had become the subject of articles in popular publications.

One focus of the Seismological Society paper was on previous studies that concluded the 1906 rupture had stepped from one trace to another during the earthquake. The stepping hypothesis was based on the conclusion that a 1906 photograph showing dislocations of a road at the fault crossing had been printed incorrectly in reverse. According to this concept, the image, when printed according to the

interpretation, revealed that the rupture crossing was at a different location than previously reported, and as a result fault movement in 1906 in Portola Valley had to have stepped from one trace to another. However, one of several 1906 photographs taken at the fault crossing locality showed a well-dressed man whose jacket was partly open, revealing that the buttons were on the right, correct for men's attire. This observation proved that the photograph of the man and the one of the fault rupture across the road had not been printed in reverse, and, therefore, there had been no stepping. It was discussion of the buttons that caught the attention of reporters and resulted in articles in the popular press. One article, entitled "Old Photos Help Scientists Relocate 1906 San Francisco Quake Rupture Point," was by Mary Caperton Morton, in *Earth*, December 2013. Another article by Becky Oskin, "Digging Up the Truth: 1906 Mystery Solved," was in *LiveScience: Our Amazing Planet*, 2013. The Wrucke, Wrucke, and Sayre paper was chosen by the Seismological Society to be highlighted in a press release announcing publication of volume 103. The authors of a 2013 paper on the San Andreas were surprised to learn that an observation in their paper became the subject of articles in popular publications.

Licensing of Consulting Geologists

Howard Wilshire

This is a query to geologists/geophysicists who are involved in consulting, or who know consulting geologists—those who either provide geotechnical reports for assessing development projects or who might review official technical reports for nonscientist citizen groups. In California, to do either requires that you be licensed by the State. Licensing is overseen by a politically appointed Board, lodged in the state Department of Consumer Affairs, that is supposed to protect the public from geologic advice of unlicensed practitioners, or licensed ones that "serve the client, but not the public." Until 2009, California had a pretty good licensing Board. Initially, in 1968, it was named the Board for Registration of Geologists, but its duties were broader and encompassed the goals of the Geologist and Geophysicist Act (Act hereafter), including a disciplinary function to control malpractice. It was renamed the Board for Geologists and Geophysicists (BGG), with this very specific mission:

"Protection of the public shall be the highest priority for the board in exercising its licensing, regulatory, and disciplinary functions. Whenever the protection of the public is inconsistent with other interests sought to be promoted, the protection of the public shall be paramount."

In 2009, for no fiscal reason whatsoever, the BGG was abolished and stuffed into the Board for Professional Engineers and Land Surveyors, without bothering to transfer professional staff with any training in geology or geophysics. Two BGG administrative staff were transferred to the new Board for Professional Engineers, Land Surveyors, and Geologists (BPELSG). Ever since, those 2 staffers have performed all tasks under the Act, including processing complaints against the licenses of professional geologists/geophysicists. No licensed



geologist was appointed to the Board until 2010. In 2009 politics quickly surfaced, when the new Board revoked a well-considered BGG disciplinary action against a licensed geologist for “*negligence and/or incompetence*” in his geotechnical report on a housing development proposed for a landslide-prone site crossed by a major active fault, “... *as it relates to presentation of basic geologic data, geologic interpretations, public safety and geologic hazards associated with slope stability.*” Shortly thereafter, the new Board also dismissed complaints that had been under BGG investigation against that same licensee and two other licensed geologists accused of providing substandard geotechnical reports on hazard-prone sites. In 2011 the BPELSG issued three complaints against the license of a Professional Geologist for 2 reviews he had provided as a consultant to citizen groups on the geotechnical reports for two winery projects, and a third report on the accused’s own property from 10 years earlier. All three complaints arrived simultaneously in the accused’s mail, in separate envelopes. You might think, as I do, that this is a big red flag indicating disparities between the BGG’s and BPELSG’s implementation of their mission. The accused licensee submitted full and detailed responses to all of these complaints. One of the three simultaneous complaints was so absurd that the BPELSG dismissed it without citation. The other two made specific charges that were not legally supported, but which went to citation stage nonetheless. After an Informal Conference requested by the accused, the BPELSG dismissed the Citation against the 10-year old report because the work had not been performed by the accused. This information had been provided in the accused’s response to the complaint, which makes the Board’s Citation an absurdity worthy of Alice in Wonderland. The BPELSG’s Citation on the third complaint has been subject to a formal hearing by an Administrative Law Judge, the last avenue for redress of a faulty

complaint offered by the bureaucracy to an accused licensee. Absurdities abound in this case also: the Board’s Citation found the licensee guilty of practicing hydrology without a license because he commented on the geologic evidence used as a basis for a rudimentary water supply assessment in the report of another Professional Geologist lacking any Hydrology certification. The water supply assessment had been produced for a rich and influential client. Even here, there is scant reason for optimism about a just outcome, as the regulations that govern such hearings defer to the interests of the agency (BPELSG) to an extreme extent. I would like to hear from those among you who work for consulting firms or provide real peer-reviews of consultants’ geotechnical reports on matters that affect public safety. What are your experiences? What are your concerns? Please respond to howardgw@comcast.net.

News from Retirees

Anny Coury : It is difficult to believe that I retired 20 years ago this month! So far, it has been a great adventure....Glenn and I built a separate studio in which I have diligently and lovingly created 74 (working on #75!) stone sculptures. 32 have been sold and the remainder are at home and in 2 local galleries. (Colorado Yule marble is my favorite medium, but I have carved other marbles, limestone, alabaster, and even shale and selenite...my website: www.annyrocks.com) I am still doing and teaching yoga and regularly hiking in the Rockies, although downhill skiing is now only a fond memory! We spend a lot of time with our 2 school-age granddaughters. Glenn and I have been going to Europe every year—usually France—but our 2013 trip to Ukraine (BEFORE the beginning of hostilities) was very special. I visited for the first time the birthplaces of my parents, and our guide/genealogist was able to reveal many heretofore unknown details

about my family history. Our next voyage will be to Croatia; we were there several times in the Yugoslavia/Tito days...so this should be interesting! In summary, I have to say that "Life Is Good!"

Terry Keith: I always enjoy the GD Retirees Newsletter and will try to interest some newly retired folks from what used to be AVO and the Minerals group up here in Anchorage. Also, Helen Foster (she turned 95 years old last Dec) and I climbed a relatively newly named mountain in Interior Alaska summer before last with the Warbelow family. The mountain is Mt. Warbelow, named for their dad with whom we used fly out to bush camps. I have a couple of pictures. I'd send you a blurb right now but it will take time to find stuff, and I'm currently very busy helping a USGS person get a lagging paper out. (I'm a volunteer, not a scientist emeritus as there are too many strings attached to emeritus, but none to volunteer.) More later, and thanks for keeping us GD folks informed.

Barney and Pat Poole: Routine activities of Barney and Pat Poole were punctuated last year by several noteworthy events. We traveled to Cabo San Lucas in April where we were joined by Glen and Gretchen Izett for an enjoyable week of reminiscing and relaxation. We drove to central Nevada in July for Barney to final field check two geological maps. In late September, we drove to western Colorado to view the aspen colors. We continue to enjoy plays in Denver and Arvada theaters and Metropolitan Operas transmitted in HD to our local movie theater. Pat continues with adult education classes at OLLI (Osher Lifelong Learning Institute). Barney spends most days working on legacy products. In early March (2015), we plan a trip to Africa to participate in a safari in northern Tanzania.

Bob Ryder: One accomplishment since retirement in September 2011 is the writing and

compilation of a collection of anecdotes about highlights of my 1985 and 1991 trips to China. The 1985 trip (delegation chairman Albert Bally, Rice University; additional USGS delegate, I-Ming Chou, Reston), sponsored by the U.S. National Academy of Sciences and the Chinese Association of Science and Technology, included workshops in Zhuoxian (Hebei Province near Beijing) and field studies throughout the Qaidam Basin in remote parts of Gansu and Qinghai Provinces. The 1991 trip (delegation chairman Dudley Rice, USGS, Denver), sponsored by the USGS and the Chinese Ministry of Geology and Mineral Resources, included workshops in Chengdu, Chongqing (Sichuan Province), and Wuxi (Jiangsu Province) and field studies throughout the Sichuan Basin. This collection, entitled "The Dragon in Transition: Glimpses of China in August-September 1985 and October 1991," is largely a nontechnical document meant for distribution among family and friends. Although I am not officially a Scientist Emeritus, I still visit the USGS National Center to see friends and former colleagues and assist with several unfinished manuscripts and cross sections. I plan in the near future to attend a Reston Retirees Luncheon.

George Ulrich: Sally and I are putting our Sarasota villa on the market and planning to move back to Colorado to the old folks farm. Looking forward to seeing more of our former colleagues in the Boulder-Denver area.

Memorials

Alicita (Koenig) Hamilton, my wife of 67 years, lost her struggle with congestive heart failure on January 21. Many Survey people knew her casually, but few were aware that, as an early-childhood educator, she bettered many lives far beyond those she influenced directly. Born in 1926, she grew up in Los Angeles. We met in 1943, when she was a high-school senior and I had just begun Navy officer training, and married in 1947, when she was a Scripps College

senior and I a UCLA grad student. Her college course work emphasized child development and psychology, and her 1948 honors thesis was on preschool children with whom she worked. She taught kindergarten briefly before settling down to raise our own children, mostly in Colorado.

Alicita earned an M.A., and was a member of the staff and faculty of the University of Denver Speech and Hearing Clinic, and successor Department, from 1962 to 1982. She began as the preschool teacher in an experimental program aimed at integrating hearing-impaired children, fitted with hearing aids, into sound-filled education and society. She surrounded them with language, music, and rhythms in a supportive setting of imaginative indoor and outdoor play and learning by doing, as appropriate for their ages. Therapists helped the children with vocal speech. All of this was then uncommon with at-risk youngsters of all types. Hearing-impaired children were traditionally relegated to the permanently silent world of sign language, special education, and inappropriately directed “teaching.” The experimental program was highly successful, its methods were widely adopted elsewhere, and even babies are now tested and given aids in many places. Alicita trained student clinicians to work with small children, and taught courses in child development and parent counseling. The preschool evolved to include children with other communication disorders, and then also normally developing youngsters. She wrote in 2013 a long-planned memoir on her D.U. experience, *Missy Hamilnook reflects on early childhood education*, incorporating much material written at the time, available through on-line booksellers and e-book publishers. The book was favorably reviewed in several journals, and gained her an educator’s award. Throughout her life, Alicita worked to make the world a better place. At 40, she was a founding member, and later a president, of Colorado Association for the Education of Young Children. At 80, she played an important role in setting up a

continuing-education program for senior citizens, which now has 400 participants. A friend who worked closely with her in recent years wrote me after her death, “Her view of the world was so honest and certain that I, and legions of her fans, couldn’t help but fall under the spell of her strength, intelligence and wit. She wanted, and expected, the best from the world, but didn’t stand back and wait for it to happen.” Our children (professors Lawrence and James, architect Kathryn), six grandchildren, and two great-grandchildren, and I, are not alone in missing her.

Warren Hamilton

Anita G. Harris, whom many in Denver knew from her volunteer conodont work during the summers of 2004 to 2008, passed away on July 12, 2014, in Florida. She had been battling Alzheimer’s Disease for a number of years. She was born Anita Gloria Fisher in Brooklyn on July 10, 1937, and studied geology in New York. After receiving her B.S degree, she headed west to Indiana in her DeSoto automobile to complete a master’s degree in Geophysics. In 1959 she and her first husband Jack Epstein were “assistant geologists” to one Irving J. Witkind of the USGS, working in and around Yellowstone Park. All three were camping in the western part of the park and experienced the Hebgen Lake Earthquake of August 1959.

Anita and Jack were then assigned to work in Louisiana, and after a year they both decided they needed to get their Ph.D.’s if they were to avoid a career in the swamps. They both went to Ohio State University, where Anita faced skepticism there at being a woman graduate student. Undeterred, she merely outperformed all the other graduate students and completed her Ph.D. in 1964, with her dissertation covering three separate fields in Geology, including micropaleontology and glacial geology. She specialized in conodont research related to biostratigraphy, and invented the “Conodont

Alteration Index” that links conodont color to thermal maturation of sedimentary sequences, which has been employed in petroleum exploration geology since. Anita was the central figure in the John McPhee geology book *In Suspect Terrain*.

Anita retired from the USGS in 1999, having been based in Reston and at the Smithsonian in Washington, D.C. She took two “sabbaticals” along the way, teaching one year at Case Western Reserve University in Cleveland and one year at Duke University. After retiring, she moved to Florida, to be near her daughter Laura and her family. In 2004, she arranged to do volunteer conodont work for a month in a lab set up in Denver (she did not want to spend more time in Reston!). Over the next four summers, Anita came to Denver and continued to work on conodonts, and lived in my house each summer. We soon became fast friends and made a number of adventurous trips together, including going to Key West, a road trip from Denver back to Florida, and a trip to Martinique. In 2009, I invited Anita to take a trip back to Yellowstone for the 50th anniversary commemoration of the Hebgen Lake Earthquake. Over the years and trips we made together, I enjoyed hearing numerous stories of her life and adventures. I, in turn, experienced my own adventures and now have Anita Stories to tell. My favorite one occurred in a “Homestyle Cookin’” restaurant in Alabama. Now, Anita was not exactly shy about sharing her opinions. When asked how she liked the food, she declared quite loudly “If this is supposed to be like home cooking, I would have run away from home!”

Anita was one of the brightest, most interesting, most crazy and outlandish, most generous people I have known. I am sure those who knew her will miss seeing her running down the hall with her pigtails flying.

David Fey

Ilene Everhart Hathaway, 90, a resident of Falmouth for the past 53 years, died on Jan. 30 from the long-term effects of Alzheimer's Disease. She was born on March 29, 1924 on a farm in Gypsum, KS, the daughter of the late Lloyd R. and Elsie (Rutz) Everhart. Because of her desire to help people, she earned an R.N. degree from St. John's Hospital School of Nursing in 1947 and a B.A. degree in nursing education from Marymount College, Salina, KS, in 1948. She began her nursing career as a medical and surgical nursing instructor at the Hudson City Hospital School of Nursing in Hudson, NY, where she met her husband John C. "Jack" Hathaway. They married on Feb. 4, 1951, in Champaign, IL, where she was the director of the Julia F. Burnham School of Nursing. At the completion of her husband's graduate studies at the University of Illinois, Champaign-Urbana, his employment by the U.S. Geological Survey (USGS) brought them to Takoma Park, MD, in 1952, to Denver, CO, in 1958, and then to Falmouth, MA, in 1962. She also spent many happy summers raising her family of four children at the family cottage in Oak Bluffs, Martha's Vineyard, MA. From 1985 to 1989, she and Jack lived in Bandung, Indonesia, while he was the USGS resident advisor in marine geology to the Government of Indonesia. This was a magical time, and she loved her life as an expatriate. She was socially active and elected vice president of the Woman's International Club and became a member of the Helping Hands to help the poor in West Java. In Falmouth, she was a volunteer instructor for the Falmouth Hospital Auxiliary Volunteer Nurses Aides and worked part-time as an R.N. at the Falmouth Hospital and in private duty nursing. She was an active member of the First Congregational Church in Falmouth, sang in the choir for 45 years and was one of the original founders of the Children's Clothing Exchange at the church.

Ilene was the organizer of the family of six and

always had them supplied, packed and ready to go on the many family trips. She loved gardening, sewing, traveling, and music. She sang in a choir in every place she lived. She played the clarinet in her high school band, the Falmouth Town Band, and the Cape Conservatory Concert Band. She also played the anklung in a musical wind ensemble in Indonesia. She traveled the world with her husband visiting about 40 countries. To keep up with her active family, she valiantly tried downhill skiing and followed them to Colorado, the Northeast, and the Alps; and accompanied her husband and family on many sailing trips in the waters of the East Coast, the British Virgin Islands, and inland waterways of New York State.

She leaves her husband of 64 years, Jack; daughter Debra and husband David Foster, son David and wife Jane Hathaway; son Martin Hathaway; daughter Alicia and husband Michael Buccino; and son Wie Gie Lim and his partner Amy O'Rourke. She also leaves six grandchildren, five step-grandchildren, nine step-great-grandchildren, her sister Wanda Lee and husband William Grosser of Salina, KS, and many nieces and nephews. She was predeceased by her grandsons, William Foster and Nicolas Buccino, and four brothers.

The Cape Cod Times



Blair F. Jones, 79, died at home in Alexandria, VA, on March 30, 2014. He was born on April 14, 1934 on the South Side of Chicago, IL to the late Ralph and Phyllis Jones. Blair joined USGS in 1956 and obtained his Ph.D. from Johns Hopkins University in 1963. Blair was hired as a geochemist and hydrologist at the inception of the National Research Program. He served as the first Research Advisor in NRP Groundwater Chemistry within the Water Resources Division. He helped hire several outstanding geochemists into the WRD ranks and organized a

popular course on "Geochemistry for Groundwater Systems" that is still taught at the USGS National Training Center. Blair made many fundamental contributions to our understanding of water-rock interactions, especially the mineralogy and geochemistry of clay minerals. Blair was that rare breed of geologist/hydrologist who used his extensive field experience and intuition to inform numerical modeling. He pioneered the development of computer models for calculating the distribution of elements and chemicals among ion pairs and complexes in natural waters. Blair's speciation-saturation chemical code WATEQ eventually spawned PHREEQC - presently the most widely used code for such calculations. Blair was regarded as the world's authority on non-marine brines and their associated minerals and developed code (SNORM) to investigate their genesis. He was affectionately and appropriately known as the "Brine Monster" to many of his colleagues. He also was the top expert on the alteration of volcanic glass and the formation and characterization of poorly crystalline clay minerals, which he first encountered in his field studies of saline lakes and then applied to characterize the chemical evolution of these lakes and to reconstruct past environments and climate. Blair was best known for his seminal work on the Great Salt Lake in Utah, but he also worked in other saline systems around the world, including Africa and Australia, which gained him an international reputation. In recent years, and in collaboration with his wife Jane Flinn, Blair applied his knowledge of the behavior of aqueous metals to help understand the adverse human health effects that first-order transition metals like zinc and copper can have as environmental contaminants.

Among his many honors, Blair was elected a Fellow of both the Geological Society of America and the Mineralogical Society of America, was honored as the Ingerson International Lecturer by the International Association of Geochemistry (2002),

and served as President of the Clay Minerals Society (2002). He was one of the first scientists in NRP to achieve “ST” status in USGS and also was awarded the DOI Distinguished Service Award. Blair was always nurturing, patient, and enthusiastic with junior colleagues, and he had an encyclopedic knowledge of researchers in and out of USGS. He had a marvelous sense of humor that was appreciated by everyone, and he could turn frustrating moments into laughter. Traffic jams on the Beltway’s American Legion bridge over the Potomac became forever known as the “Car-Strangled Spanner.” He also had a love and enthusiasm for good wine and music. We will miss Blair Jones’ vast knowledge, his great wit and humor, and most of all, his companionship. He was a tennis player, oenophile, cat lover, jazz aficionado, and Civil War and railroad enthusiast. Blair was preceded in death by his first wife, Betty Foster Jones, who died in 1993. Blair was the husband of Jane; father of Geoffrey (Lisa) and Sheryl, step-father of Susan (Bradley); grandfather of Bryan; and brother of Ed. He also leaves his cat, Graham. A Memorial Service was held on Saturday, April 12, 2014 at St. John’s Episcopal Church, Norwood Parish, Chevy Chase, MD, where Blair was a devoted member. In lieu of flowers, donations may be made in Blair F. Jones’ memory to: The Geological Society of America Foundation (www.gsafweb.org), Hearts and Homes for Youth (www.heartsandhome.org), the Washington Tennis and Education Foundation (www.wtef.org), or the Washington Humane Society (www.washhumane.org).

Jerad Bales

Mary J. Malloy died on July 12, 2014. Mary was an Alaska Branch secretary in the 1970s and 80s; then moved over to Water Resources, retiring, I think, sometime in the 90s or early 2000s. When she was in the Alaska Branch, she worked with Dave Hopkins, Oscar Ferrians, and me. I remember her as a hard-

working, professional, employee, who loyally supported her assigned guys.

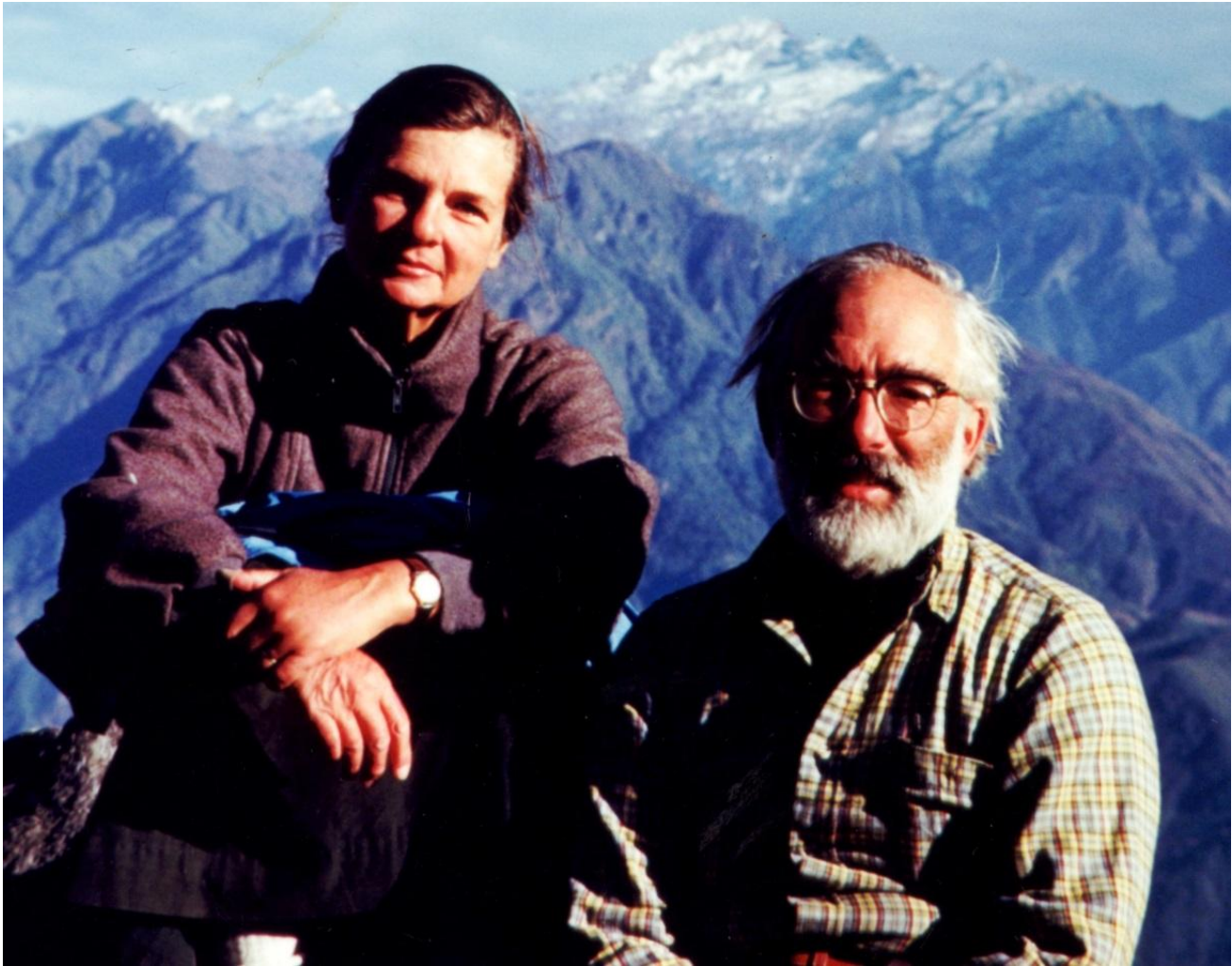
Hank Berg

Douglas W. Rankin (Doug) died Wednesday, February 25, 2015. He was 83. Doug received a B.A. cum laude in geology from Colgate University in 1953 and a M.A. (1955) and Ph.D (1961) from Harvard University. He had a 53-year long career as a research geologist -- mostly with the USGS -- which he blended with a love of woods, mountains and water that began in his childhood. He was internationally known as a synthesizer of Appalachian geology, based on extensive field work oriented to understanding tectonics and paleovolcanism. His lifelong career was devoted to investigating the complex bedrock of the Appalachian Mountains from Maine south to North Carolina, beginning with his Ph.D. research on rhyolites in Baxter State Park in Maine (1955-1961) and ending with an ambitious 23-year-long project investigating the geology of the upper Connecticut River valley in New Hampshire and Vermont (1992-2014). Nineteen of these latter years were spent in ‘retirement’ as an Emeritus Scientist. Doug’s quest to unravel the complex ancient geologic history of the earth led him to spend long periods of time in some of the most beautiful and remote places on the planet. He loved to hike mountain ridges, swim in lakes and streams, and nap in the sun after lunch. These passions developed early in life while hiking with his father, Carl, mother, Helen, and brother, Bruce, and subsequently while maintaining trails as a member of the Appalachian Mountain Club Trail Crew. Later he was accompanied for most of his geologic field work by his wife, Dr. Mary Louise B. Rankin, a China historian who developed her own competence in geology. Together Doug and Mary cared for a cherished woodland property in Hillsdale, New York, and maintained deep ties to the White Mountains,

New Hampshire, and the AMC, where they met. Doug also loved maps; he collected them and he also created them -- geologic maps, by hand, using ink and colored pencils. He always sought to collaborate with

others and took pleasure in mentoring junior colleagues.

The Rankin Family and Scott Southworth



Mary and Doug Rankin

Bill Rambo passed away peacefully on August 17, 2014, at home with his daughter by his side. As those of you who had the joy of working with Bill can attest, Bill was always at peace. His warm smile and easygoing attitude supported his profound aptitude for science and never-ending curiosity and helped lead to his success in serving the USGS and the American people for over five decades. It is next to impossible to summarize the impact Bill had on the Survey in his

52 years of work. Just three weeks ago, we had a retirement party for Bill in Menlo Park, which included an amazing tribute and summary of his history with the Survey. With his passing, it is a moment for all of us to reflect back on his life and career with USGS and continue to learn from his example of spirited service.

In 1962, Bill started work at the USGS while still in college. In 1963, he finished his B.S. in geology at

San Jose State University and started in the Branch of Regional Geophysics, specializing in gravity surveys. His work took him all over from Antarctica to Alaska, and much of the US in between, building a reputation as, “the best field worker in the branch” and “the most versatile, capable field technician on our staff.” A little known fact about Bill is that in 1968, due to his contributions to the advancement of scientific work in Antarctica, the Rambo Nunataks in Antarctica were named for him.

In 1969, while doing a gravity survey along the Stony River in Alaska, Bill was struck in the head with an airplane propeller and seriously injured. That hit to the head left Bill physically injured for the rest of his life. It did not; however, lessen his desire to serve the American people. In 1970, one year into his rehabilitation therapy, Bill received the Congressional Antarctic Service Medal via National Science Foundation, and the DOI Antarctica Service Certificate. Bill spent the first half of the 1970’s working hard at rehab and physical therapy. He learned all over again how to get around and take care of himself. From 1975 through 1977, Bill came back to work at USGS, gradually increasing his hours each week. He worked for the EROS Applications Assistance Facility, helping people locate satellite imagery, aerial photography, and other remotely sensed data. He set up a library in USGS for remote sensing for natural resource inventories and management.

In 1978, he became Staff Geologist for Geologic Inquiries. It was in this position that Bill flourished and made remarkable achievements in public outreach far beyond answering inquiries. During the 1980s, he played a major role in Open Houses and re-established an exhibits shop and program in Menlo Park. He took the USGS on the road to county fairs and airshows at Moffett Field Naval Air Station. He brought USGS science out of the ivory tower and directly to the public in the days before there was

much support or recognition for the importance of that type of activity. He established networks of other like-minded individuals in the USGS, including the Earth Science Information Committee, and later chaired the Geologic Division Outreach Group (GDOG). Bill brought educational exhibits and displays to the Menlo Park campus buildings as well, from exhibit panels and display cases in hallways, to creating explanatory signs for the many rocks around campus.

In 1986, Bill was recognized as the Federal Employee of the Year in the “handicapped” category by the San Francisco Bay Area Federal Executive Board; in 1989, he received a Presidential Award for Outstanding Employee with a Disability for “his enthusiasm, persistence, and diligence in alerting the public to the relevance of USGS research to society.” In 1990, Bill started the Public Lecture Series, which has been and still is a huge success after 24 years. Following his lead, other USGS offices in Reston, Denver, and elsewhere began their own public lecture series modeled on what Bill created. By 2001, with 41 years of federal service, Bill had maxed out his federal retirement benefits, but he still wasn’t finished. In 2002, Bill became part of the regional Office of Communications. In addition to his previous responsibilities, Bill was now also responsible for internal communications, weekly highlights, and more. In 2013, Bill was granted the DOI Meritorious Service Award, due to his continued dedication to finding new ways to communicate to ever larger and more diverse audiences. With fifty-one years into his service, he was still innovating communications. I think we can all agree, after reflecting on the highlights of his career, that not only is it incredible *what* he was able to accomplish for the USGS, but that it is truly remarkable that he was able to do it in ONLY 52 years. He will be missed but not forgotten.

Justin Pressfield



Edward Thompson Ruppel, of Twin Bridges, died at home on June 27, 2014. Ed, a renowned geologist whose life's work focused on the mountains of Montana and Idaho, was born Oct. 26, 1925. He graduated from Twin Bridges High School in 1943, from the University of Montana, Missoula, in 1948, from the University of Wyoming in 1950, and from Yale University, where he earned his Ph.D. in geology in 1958. Ruppel retired as Montana State Geologist and Director of the Montana Bureau of Mines and Geology in 1991, after a distinguished and prolific career. He spent 30 years with the U.S. Geological Survey, and he produced major geological studies in Yellowstone National Park, east-central Idaho and southwest Montana. He authored more than 50 significant geologic maps and professional publications. In addition, Ruppel wrote two popular geologic guides: "The Gold Mines of the Virginia City Mining District, Madison County, Montana," and "Along The Great Divide: The Rocks and Their History Along the Continental Divide Trail between Montana and Idaho." During his time at USGS, Ruppel served as the Chief of the Branch of Central

Environmental Geology, supervising 70 earth scientists engaged in the geologic and related studies in the 13-state Central Region of the Rocky Mountain and High Plains. Ruppel left USGS in 1986 to accept the position as Montana's State Geologist. There, Ruppel established the Co-GeoMap Program, which has provided funds for fundamental geologic mapping in Montana for the past 20 years. Ruppel also directed significant expansion of the MBMG's groundwater programs, including the Ground Water Assessment Program that began in 1991 and continues today. After his retirement from MBMG in 1994, Ruppel continued to conduct field research in the Snowcrest Range in southwest Montana, including mapping and resource studies of the Virginia City mining area, mapping the geology of the Continental Divide Trail, and research for Princeton University on the Beaverhead meteor impact region. In 1992, Ruppel received the first Tobacco Root Geological Survey Award for excellence in Field Work and in 1996 he received an Honorary Doctor of Science from the University of Montana. In 2013, the Montana Bureau of Mines and Geology at Montana Tech named Ruppel the recipient of the Uno Sahinen Silver Medallion, a lifetime achievement award that is given to an eminent geologist each year. Ruppel was a child of Montana, spending his early and last years in Twin Bridges. His grandfather, William Ruppel, was a Montana pioneer, who came to Twin Bridges from Germany in 1882, eventually purchasing the 652-acre Wilhart Ranch. His father, Henry Ruppel, was the superintendent of schools in Twin Bridges for more than 20 years. After graduating from Twin Bridges High School, Ruppel joined the Navy, and in 1945 entered the V-12 Officer's Training Program. He served on the PC-802, a patrol craft in the China service area. All of Ruppel's four brothers were Naval officers, as was his eldest son, David Ruppel. Upon returning to live in Twin Bridges in 1994, Ruppel was active in the community, serving as the Twin Bridges

representative on the Madison County planning board until 2008. He was a longtime member of the Rotary, and served as its president. Ruppel was a Certified Professional Geologist with the American Institute of Professional Geologists, a senior fellow of the Geological Society of America, and fellow with the Society of Economic Geologists and a member of the Tobacco Root Geological Society, Montana Geological Society, Colorado Geological Society and the Geological Society of Washington, D.C. He was a devoted husband to his beloved wife of 58 years, Phyllis Tanner Ruppel of Twin Bridges. She survives him, as do his four children, Lisa Ruppel Benenson (Joel) of New York, David Edward Ruppel (Jill) of Colorado, Douglas Thompson Ruppel (Sandy) of Arizona, and Kristin Tanner Ruppel (Jack) of Montana, and nine grandchildren – Anya Benenson, Zach Ruppel, Alexa Ruppel, Jacob Ruppel, Will Benenson, Madison Ruppel, Jessica Ruppel, Frank Ruppel, and Ruby Waller.

The Montana Standard

Audrey G. Schmidt, 1930-2015, is well remembered by many in Reston for her work in the Office of International Geology, where she was a cartographer. She first worked at the Central Intelligence Agency, where she met her future husband Warren. After marriage in 1954, they were stationed in London for two years, where she was employed at the American Embassy. When they returned to the U.S., both came to the USGS. Audrey retired in 1992. She and Warren then volunteered with the International Executive Service Corps and prepared special maps for Costa Rica. Audrey is survived by her husband, sons Jeffrey, Stephen, and Daniel, and grandchildren Samantha and Garrett.

David Ackerman

Gordon A. Swann died of metastatic cancer on May 22, 2014. He is missed by many as a friend, colleague, and Masonic brother. He was born in

Palisade, CO, September 21, 1931. He graduated from high school in Olathe, CO, in 1949. He enlisted in the U.S. Navy in 1952, was discharged in 1956, and returned to the University of Colorado. In 1962 he received a Ph.D. from the University of Colorado where he helped pioneer studies of Colorado Front Range Precambrian geology. In 1963, Gordie began a long and distinguished career with the U.S. Geological Survey. Starting in Denver, he moved to Flagstaff in 1964, where he trained astronauts to perform lunar geologic investigations, educated NASA bureaucrats, and planned missions throughout the Apollo program of manned planetary studies. He was responsible for designing the goals and procedures that Apollo astronauts would use to explore, photograph, and sample the Moon. One of his special accomplishments was personally demonstrating to doubting NASA astronauts that real geological science could be carried out by trained men, even when confined by the space suits required for their survival on the lunar surface. He was a NASA Principal Investigator for the Apollo 14 and 15 Field Geology Exploration teams and co-investigator for the other Apollo missions. Adding to the admiration of his colleagues, Gordon also received professional awards, which included the NASA Medal for Scientific Achievement and the American Institute of Professional Geologists Excellence Award. In recognition of the respect accorded him, the asteroid "Swann" was named for Gordon. Besides his professional excellence, in 1986 Gordon served as the Master of Flagstaff Masonic Lodge No. 7. He was also honored by being awarded the Thirty Third Degree of the Ancient and Accepted Scottish Rite Masons and received two Albert Pike awards for his work in the Scottish Rite degrees in the Tucson Consistory. Friends who accompanied him river rafting, boating, camping, or RVing were often entertained by his stories, jokes, songs, and Robert Service recitations. (See Gordon Swann Sam McGee

on YouTube). Gordon enjoyed friends, people and life in general for 82 years and swept others along in that enjoyment. For 20 years Gordon and Jody enjoyed a significant part of the time traveling in their 5th wheel, the last ten summers of which they spent in Port Townsend, WA, developing a love for the Pacific Northwest, crabbing and clamming, and making many new friends. He is survived by his wife, Jody, five children, nine grandchildren and nine great-grandchildren. Funeral services were held on May 31, 2014, at 11:00 a.m. at the Masonic Temple in Flagstaff.

Jody Swann



George W. Walker, our Geologic Division colleague, born 1921, died April 8, 2014. George received his B.A. degree in geology from Stanford University. His first USGS and Oregon work was in 1943 as a student of Aaron Waters studying quicksilver in Horse Heaven Mine District. From 1944 through 1946 he served as a Naval Officer on submarine chasers and landing craft (infantry) in the Western Pacific. After completing his military service, he earned an M.S. degree in geology (Petrology) from Stanford University (1948) and rejoined the USGS Mineral Deposits Branch in the San Francisco Bay Area. From 1953 to 1958 he was based at the USGS office in Denver doing uranium

reconnaissance in the western United States. Returning to Menlo Park in 1958, he started preparation of a geologic map of the entire state of Oregon, a project that proved to be the cornerstone of his USGS career. George authored or co-authored numerous professional papers and maps, primarily on Oregon but also covering areas in California and Hawai'i. From 1972 to 1976 he served as Chief, Branch of Western Mineral Resources. He was the recipient of the DOI Meritorious Service Award. George retired in 1986 but continued involvement with the USGS while the Geologic Map of Oregon (G. W. Walker & N. S. MacLeod, 1991), one of the first produced digitally, was being edited and published. George was predeceased by his wife Barbara in 2005. He is survived by a daughter, Candace Walker.

Candace Walker and Patrick Muffler



Gerald Francis Wieczorek, born 1949, passed away on February 1, 2015 after a long struggle with frontotemporal dementia. Gerry was highly influential

in the national and international landslide hazards community. He was an extraordinary, gifted scientist who enthusiastically shared his love of science and of life in general with colleagues, friends, and family. His undergraduate and graduate training was all at U. Cal.-Berkeley, where he was awarded a B.S. in Civil Engineering, and an M.S., M.E, and Ph.D., all in Geological Engineering. In 1975 he was hired by Bob Schuster, Chief of Engineering Geology, into the USGS, where he worked for the rest of his career. His earliest USGS work, with R.C. Wilson and Ed Harp, was on seismically induced landslides in San Mateo County, CA, which led to a prototype regional map for hazard susceptibility. As part of that research, he began a long-term study of the La Honda debris-flow in San Mateo County. With his colleagues, he developed a real-time warning system for a series of slides that were causing numerous problems with roads and property; the State of California adopted this system as a prototype for seismically induced landslides. Over the next several years, Gerry was invited to consult on hazards in Guatemala, the Philippines, and Yugoslavia. Rock-falls in Yosemite National Park had caused a lot of damage and several deaths of visitors throughout the 1900s. In 1980 the National Park Service asked Gerry to make a thorough study of the problem. This resulted in his work there over the next 14 years and in a number of significant publications and recommendations for mitigation of the rock-falls. The Yosemite project made Gerry acutely aware of the potential for his research to help the public avoid geologic hazards. In 1983, at the request of FEMA and the State of Utah, he took on the management of a multi-agency team to evaluate debris-flow hazards along the Wasatch Front north of Salt Lake City. The report of the team led to construction of catchment basins and other mitigation measures to protect the communities in that area. In 1985, Gerry and Bob Schuster worked in Sichuan and Yunnan, China, for two months to assess landslide

hazards in those provinces, under the auspices of the Chinese Academy of Sciences. In 1987, at the request of John Filson, Chief of the Office of Earthquakes, Volcanoes, and Engineering, Gerry and his family moved to Reston where he served as Deputy for Engineering Geology in OEVE for 4 years. In that job, he prepared a large number of public briefings on earthquake events, including Armenia, Loma Prieta, Iran, and the Philippines. He also planned for and assembled the large supply of logistical materials for our response to the Armenian earthquake. His experience as the office deputy led to further cooperation with landslide specialists in other countries. In the summer of 1991 and again in 1993, he served as visiting professor of hydrological hazard studies in Perugia, Italy; his work there was funded by the Italian National Research Council. From 1990 until his retirement in 2009, he worked in several different areas. During this period, Gerry obtained support for young visiting scientists from Italy and Germany to study with the USGS. As the support was sometimes not quite adequate, he often helped the students out of his own pocket. In completing the Yosemite project, he and colleagues developed a detailed map of rock-fall susceptibility and a database of former rock-falls, and they identified the triggering mechanisms that were likely causes. At Tully Valley, NY, a large landslide in glacial lake clays caused major problems. Gerry created a landslide susceptibility model for the area that helped the state plan for avoiding future damage. In the summer of 1995, a severe rainstorm triggered massive debris flows in Madison County, VA. Gerry assembled a team of investigators, secured funding from FEMA, and completed an exhaustive study of debris flows in the area. His study led to a reexamination of the massive debris flow event of 1949 in Nelson County, VA, that claimed 150 lives. He completed his studies in the area with a review of potential debris flow hazards in the Blue Ridge of central Virginia. In

1999, Gerry studied the debris flow and flooding catastrophe that inundated the coast of Venezuela north of Caracas and published an exhaustive report on the potential for future hazards in the area. Near the end of his long career, Gerry completed a study of the potential for wave action resulting from landslides into inlets on the Alaskan coast. Waves thus generated would be hazardous to tourist and fishing boats in the area. Gerry's lifetime of research and his significant publications advanced the science of landslide hazard mitigation tremendously. His commitment to building productive relationships in the international landslide community and to mentoring a new generation of landslide specialists was a major contribution. He will always be remembered for his dedication to science, his energetic approach to new challenges, and his wonderful sense of humor. In addition to his productive career as a geological engineer, Gerry had many other interests: he played clarinet at Berkeley, loved folk music, the Grateful Dead, the Beatles, dancing, hiking, and collecting art. He is survived by his wife, Leila Bissell; their children, Sonia and Tadek; Gayle Jurickovich and their daughter, Tenaya; and his brothers, David and Tom Wiecezorek.

Ben Morgan and John Keith

Other Recent Deaths

Richard N. Babcock
Red Bailey
Floyd Brown
William Culbertson
Mike Higgins
Claude Huffman
Ron Kistler
Rich Pollastro
Robert B. Raup
Linda Reed
Bob Schmidt
Pat Schuster
Dave Stewart

RETIREE PUBLICATIONS MOSTLY 2012 – 2015 BUT SOME OLDER

Note:

The references below are compiled from information available as of mid-May 2015. These references are “new” since the Summer 2014 Newsletter (Number 69) but also include pre-2012 publications not previously listed in prior Newsletters. An effort is made to compile **ALL** known publications (whatever year) by Geologic Division Retirees (GDR) for inclusion in the Master List of GDR Publications (now being maintained and updated by Bob Tilling). Please send complete references for any new publications (**but not those still “in press”**) to Bob (e-mail: rtilling@usgs.gov or volkno.rit@gmail.com), with cc to Odette James (e-mail: o.b.james@verizon.net) as back-up, for listing in the next Newsletter and for updating the Master List.

MELVIN H. BEESON publications:

Mastin, L. G., Christiansen, R. L., Thurber, C., Lowenstern, J., and Beeson, M.H., 2004, *What makes hydromagmatic eruptions violent? Some insights from the Keanakāko'i Ash, Kilauea Volcano, Hawaii*: Journal of Volcanology and Geothermal Research, v. 137, no. 1-3, p. 15-31.

Xu, G., Frey, F. A., Clague, D.A., Weis, D. and Beeson, M.H., 2005, *Petrogenetic similarities of east Molokai and younger Kea-trend Hawaiian volcanoes as they migrate away from the hotspot* (Abstract): Geochimica et Cosmochimica Acta, v. 69, issue 10 (Supplement), p. A110.

Xu, G., Frey, F. A., Clague, D.A., Weis, D. and Beeson, M.H., 2005, *East Molokai and other Kea-trend volcanoes: magmatic processes and sources as they migrate away from the Hawaiian hot spot*: G3, Geochemistry, Geophysics, Geosystems, v. 6, no. Q05008, doi:10.1029/2004GC000830.

Xu, G., Huang, S., Shichun, H., Frey, F.A., Blichert-Toft, J., Abouchami, W., Clague, D.A., Cousens, B., Moore, J.G., and Beeson, M.H., 2014, *The distribution of geochemical heterogeneities in the source of Hawaiian shield lavas as revealed by a transect across the strike of the Loa and Kea spatial trends: East Molokai to West Molokai to Penguin Bank*: Geochimica et Cosmochimica Acta, v. 132, p. 214-237.

Clague, D. A., Frey, F.A., Garcia, M.O., Huang, S., McWilliams, M., and Beeson, M.H., 2014, *Within-flow variability of the Sugar Loaf Melilite nephelinite flows, Honolulu Volcanics, Hawaii* (abs.): GSA Annual Meeting, Vancouver, British Columbia, 19–22 October 2014.)

Abedini, A.A., Robinson, J.E., Muffler, L.J.P., White, D.E., Beeson, M.H., Truesdell, A.H., 2015, *Database for the geologic map of Upper Geyser Basin, Yellowstone National Park, Wyoming*: U.S. Geological Survey Data Series 911, scale 1:4,800, available at <http://dx.doi.org/10.3133/ds911>.

(JOHN) DAVID BUKRY publications

Barron, J.A., Bukry, D., and Gersonde, R., 2014, *Diatom and silicoflagellate biostratigraphy for the Late Eocene: ODP 1090 (sub-Antarctic Atlantic)*, In: Kocielek, J.P. (Ed.), Nova Hedwigia, Beihefte 143. J. Cramer, Stuttgart, Germany, p. 1–31.

Barron, John A., Stickley, Catherine E., and Bukry, David., 2015, *Paleoceanographic, and paleoclimatic constraints on the global Eocene diatom and silicoflagellate record*: Palaeogeography, Palaeoclimatology, Palaeoecology 422 (2015) 85–100.

Barron, John, Bukry, Dave, and Addison, Jason, 2015, *Surface water conditions in the Gulf of California during the Medieval Climate Anomaly and Little Ice Age*: PACLIM meeting, Asilomar, March. Poster.

Information from the 2015 meeting is now archived at:
<https://sites.google.com/site/paclimconference/paclim-2015>

MICHAEL H. CARR publications:

Carr, M. H., et al., 2012, *Is Mars Sample Return required prior to sending humans to Mars ?*: Proc. Global Space Exploration Conference, Jan 20, 2012, Washington D.C.

Carr, M. H., 2013, *Geologic exploration of the Planets: the first 50 years*: EOS, 94, 29-30.

Carr, M. H., 2013, *Planetary Exploration: A 50-year personal retrospective*: Shoemaker Lecture: AGU Annual Fall Meeting, San Francisco, December 2013.

Carr, M. H., and Head, J. W., 2014, *Martian unbound water: Changes with time*: Lunar and Planetary Science Conference, Abstract No.1427.

Carr, M. H., & Bell, J. F., 2014, *Mars: Surface and Interior*, in T. Spohn, D. Breuer, & T. V. Johnson (Eds.): *Encyclopedia of the Solar System*, Elsevier, p. 359-377.

CYNTHIA DUSEL-BACON publications:

Dusel-Bacon, Cynthia, O'Sullivan, P.B., Day, W.C., and Bacon, C.R., 2014, *Apatite fission track evidence of widespread Eocene exhumation in the Fortymile district of east-central Alaska* [abs.]: Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 794.

Mortensen, J.K., and Dusel-Bacon, Cynthia, 2014, *Nature and U-Pb zircon ages of mid-Cretaceous calderas and tuffs in eastern Alaska and western Yukon: Implications for landscape evolution in the northern Cordillera* [abs.]: Geological Society of

America Abstracts with Programs, v. 46, no. 6, p. 794.

Bacon, C.R., Dusel-Bacon, C., Aleinikoff, J.N., and Slack, J.F., 2014, *The Late Cretaceous Middle Fork caldera, its resurgent intrusion, and enduring landscape stability in east-central Alaska*: Geosphere, v. 10, p. 1432–1455.

ERIC R. FORCE publications:

Force, E. R., and McFadgen, B. G., 2012, *Influences of active tectonism on human development—a review and Neolithic example*, in Giosan, L., Fuller, D.Q., Nicoll, K., Flad, R.K., and Clift, P.D., eds., *Climates, Landscapes, and Civilizations*: American Geophysical Union, Geophysical Monograph 198, p. 195-202.

Force, E. R., and Barr, S. M., 2012, *Provenance of the Lower Carboniferous Horton Group, Petit de Grat Island, Nova Scotia, as revealed by detrital zircon dating*: Atlantic Geology, v. 48, p. 137-146.

Force, E. R., 2013, *Sea-cliff erosion with rising sea level along shores exposing glacial material in Atlantic Canada: the effect of bedrock slope and an example from Isle Madame, Nova Scotia*: Geoscience Canada, v. 40 #1.

Force, E. R., 2014, *Stratigraphic evolution of provenance in a thick conglomerate-dominated sequence of Carboniferous age in the southern Isle Madame area, Nova Scotia, and paleogeographic implications*: Atlantic Geology, v. 50, p. 1-12.

Force, E. R., 2015, *Geologic aspects of ancient Villanovan settlement distributions in central Italy*: Catena, v. 125, p. 162-168.

KEITH A. HOWARD publications:

Howard, K.A., 2014, *Cordilleran metamorphic core complexes—Historical perspectives on evolution of concepts in the Basin and Range*: Geological Society of America Abstracts with Programs, v. 46, no. 5, Paper 3-10.

Howard, K.A., House, P.K., Dorsey, R.J., Pearthree, P.A., 2015, *River-evolution and tectonic implications of a major Pliocene aggradation on the lower Colorado River: The Bullhead Alluvium*: Geosphere, v. 11, p. 1–30, doi:10.1130/GES01059.1

FRANK T. MANHEIM “publication”:

Manheim, F.T., 2014, *Federal appointments then and now: A historical review of Federal government operations from the founding*: Unpublished summary of a talk presented to WRD and GD retirees, 1 September 2014, Herndon, Virginia, 3 single-space pages.

ROBERT H. MEADE publications:

Meade, R.H., and Moody, J.A., 2013, *Erosional and depositional changes wrought by the flood of May 1978 in the channels of Powder River, southeastern Montana*: U.S. Geological Survey Scientific Investigations Report 2013-5035, 28 p., 1 plate.

Moody, J.A., and Meade, R.H., 2014, *Ontogeny of point bars on a river in a cold semi-arid climate*: Geological Society of America Bulletin, v. 126, p. 1301-1316.

JAMES G. MOORE publications:

Sisson, T.W., and Moore, J.G., 2013, *Geologic map of southwestern Sequoia National Park, Tulare County, California*: U.S. Geological Survey Open-File Report 2013-1096, pamphlet 26 p., 2 sheets, scale 1:24,000, [This map includes all of the Mineral King 7.5' quad and an area to the west].

Moore, James G., and Moring, Barry C., 2013, *Rangewide glaciation in the Sierra Nevada, California*: Geosphere, v. 9, no. 6, p. 1804-1818; doi:10.1130/GES00891.1.

Jakobsson, S. P., Moore, J. G., and Thorseth, I. H., 2013, *Palagonitization and lithification of the Surtsey tephra* (abs.): Surtsey 50th Anniversary Conference, 12-15 August, Reykjavik, Iceland.

Moore, James G. and Schweickert, Richard A., 2013, *Megasplash at Lake Tahoe* (abs): Fall Meeting, American Geophysical Union, San Francisco.

Xu Guangping; Huang Shichun; Frey, Frederick A; Blichert-Toft, Janne; Abouchami Wafa; Clague, David A; Cousens, Brian; Moore, James G; and Beeson, Melvin H, 2014, *The distribution of geochemical heterogeneities in the source of Hawaiian shield lavas as revealed by a transect across the strike of the Loa and Kea spatial trends: East Molokai to West Molokai to Penguin Bank*: Geochimica et Cosmochimica Acta, v. 132, p. 214-237.

Moore, James G., Schweickert, Richard A., and Kitts, Christopher A., 2014, *Tsunami-generated sediment wave channels at Lake Tahoe, California-Nevada, USA*: Geosphere, v. 10, n. 4, p. 757-768. doi:10.1130/GES01025.1

Moore, James G., 2014, *The 1973 eruption of Eldfell Volcano, Heimaey, Iceland* (Abs.): Conference on Surtsey at 50 Years, International Continental Scientific Drilling Program, Sept. 30-Oct. 4, 2014, Heimaey, Iceland.

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KENNETH PIERCE publications:

Pierce, K.L., Licciardi, J.M., Krause, T.R., and Whitlock, Cathy, 2014, *Glacial and Quaternary geology of the northern Yellowstone area, Montana and Wyoming*, in Shaw, C.A., and Tikoff, B., editors, *Exploring the Northern Rocky Mountains: Geological Society of America Field Guide 37*, p. 189-203, doi:10.1130/2014.0037(09).

Pierce, K.L., Chesley-Preston, T.L., Sojda, R.S., 2014, *Surficial geologic map of the Red Rock lakes area, Montana*: U.S. Geological Survey Open-File Report 2014-1157, scale 1:24,000, parts of six 1:24,000 quadrangles and includes 21 page pamphlet.

Krause, T.R., Lu, Yanbin, Whitlock, Cathy, Fritz, S.C., and Pierce, K.L., 2015, *Patterns of terrestrial and limnologic development in northern greater Yellowstone ecosystem (USA) during the late-glacial/early-Holocene transition*: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 422, p. 46-56.

MARITH REHEIS publications:

Reheis, Marith, Mahan, Shannon, Budahn, James, and Rhode, David, 2014, *Holocene loess vs. modern dust in the Cima volcanic field, in Reynolds, R.E., ed., Not a Drop Left to Drink*: 2014 Desert Symposium, California State University Desert Studies Center, p. 228. <http://nsm.fullerton.edu/dsc/images/DSCdocs/2014Notadroplefttodrink.pdf>

Reheis, M.C., Adams, K.D., Oviatt, C.G., and Bacon, S.N., 2014, *Pluvial lakes in the Great Basin of the western United States—a view from the outcrop*: *Quaternary Science Reviews*, v. 97, p. 33-57.

Maher, K., Ibarra, D.E., Oster, J.L., Miller, D.M., Redwine, J.R., Reheis, M.C., and Harden, J.W., 2014, *Uranium isotopes in soils as a proxy for past infiltration and precipitation across the western United States*: *American Journal of Science*, v. 314, p. 821-857.

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Reheis, M.C., Miller, D.M., McGeehin, J.P., Redwine, J.L., Oviatt, C.G., and Bright, Jordon, 2015, *Directly dated OIS 3 lake-level record from Lake Manix, Mojave Desert, California*: *Quaternary Research*, v. 83, p. 187-203.

PETER D. ROWLEY publications:

- Biek, R.F., Rowley, P.D., Hacker, D.B., Hayden, J.M., Willis, G.C., Hintze, L.F., Anderson, R.E., and Brown, K.D., 2009, ***Geologic map of the St. George and east part of the Clover Mountains 30' x 60' quadrangles, Washington and Iron Counties, Utah***: Utah Geological Survey Map 242, + 101 p. pamphlet, scale 1:100,000.
- Biek, R.F., Moore, D.W., Anderson, J.J., Rowley, P.D., Nealey, L.D., Sable, E.G., and Matyjasik, Basia, 2009, ***Interim geologic map of the south-central part of the Panguitch 30' x 60' quadrangle, Garfield, Iron, and Kane Counties, Utah—Year-1 progress report***: Utah Geological Survey Open-File Report 553, CD, 66 p., scale 1:100,000.
- Rowley, P.D., Steven, T.A., Briskey, J.A., Bethke, P.M., and Rye, R.O., 2009, ***Dedication to Charles G. (“Skip”) Cunningham: in*** Tripp, B.T., Krahulec, Ken, and Jordan, J.L., editors, *Geology and geologic resources and issues of western Utah*: Utah Geological Association Publication 38, CD, p. vii-xii.
- Rowley, P.D., Dixon, G.L., Burns, A.G., and Collins, C.A., 2009, ***Geology and hydrogeology of the Snake Valley area, western Utah and eastern Nevada, in*** Tripp, B.T., Krahulec, Ken, and Jordan, J.L., editors, *Geology and geologic resources and issues of western Utah*: Utah Geological Association Publication 38, CD, p. 251-269 + Plate 1, Geologic map, cross sections, and explanation of geologic units of the Snake Valley area (scale 1:250,000).
- Kistinger, G.M., Prieur, J.P., Rowley, P.D., and Dixon, G.L., 2009, ***Characterization of streams and springs in the Snake Valley area, Utah and Nevada, in*** Tripp, B.T., Krahulec, Ken, and Jordan, J.L., editors, *Geology and geologic resources and issues of western Utah*: Utah Geological Association Guidebook 38, CD, p. 299-323.
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- Ball, G.W., Dixon, G.L., Johnson, Kenneth, Katzer, T.L., Rowley, P.D., Rumbaugh, James, Smith, D.L., Childress, Jack, and Squires, Robert, 2010, ***Hydrogeologic evaluation and ground-water modeling of the Snake Creek Desert hydrologic basin, Washoe County, Nevada, and Lassen County, California***: Unpublished report (CD) prepared for LSC Project, under direction of Watersource Consulting Engineers, Inc., Reno, Nevada; includes Plate 1, Geologic map of the Smoke Creek Desert, Nevada and California, by Dixon, G.L., Rowley, P.D., Ekren, E.B., Faulds, J.E., Ramelli, A.R., Vice, G.S., and Brickey, D.W., scale 1:100,000.
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- Rowley, P.D., Biek, R.F., Sable, E.G., Boswell, J.T., Vice, G.S., Hatfield, S.C., Maxwell, D.J., and Anderson, J.J., 2013, ***Geologic map of the Brian Head quadrangle, Iron County, Utah***: Utah Geological Survey Map 263DM, CD, 38 p., scale 1:24,000.
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