Celebrating and Enhancing Diversity
-- Message from the Chair –

A recent e-mail from one of our members inspired this message centered on celebrating diversity. In fact, it led me to read some of the previous QG&G newsletters. One reading led to another, and before I knew it, I had read all of the QG&G newsletters over the course of a weekend. Yes, all (!) of them, beginning with the first “salutatory” in 1957 by William D. Thornbury as Editor. It was an amazing experience. I felt as if I were re-living history as it unfolded. I could feel the typewriters generating the words letter by letter. I saw, for example, when the “w” on the typewriter would stick through one newsletter. I felt the painstaking and at time struggling efforts of the early editors to gather information from members, at one point assigning nine (!) associate editors the responsibility of gathering news from various regions of the U.S and around the world. All the newsletters (and indeed much of the exchange of information) traveled through slow mail, of course. If any of those colleagues are able to read this newsletter now, I would like to tell them, firstly, that we are grateful for their extraordinary efforts. Those early efforts enabled us to thrive, and to enjoy the comparatively easy ways in which we continue to expand our reach and conduct business today. I also salute our historians for keeping our history so alive and accessible!

Since QG&G Chairs began writing messages regularly in the mid-1990s (and occasionally before then), several themes have appeared. In the background were the consistent messages of health and growth of our discipline. Membership showed an increasing trend overall, for example, so that we remain steady as one of the largest divisions in GSA. QG&G has routinely sponsored large numbers of technical sessions at annual meetings, as Quaternary geology and geomorphology are increasingly connected to other sciences, and more relevant to society than ever. We also offer comparatively large numbers of awards that reflect our contributions to science and our efforts to support and recognize this work. All of this is true today. As a case in point, last year, QG&G began to give yet another new award – the John A. Black Award to support graduate student field-based research on coastal processes. The number of technical sessions sponsored by QG&G, and the ways in which they intertwine with other areas of geology, is evident in the complexity of the Joint Technical Program Committee’s tasks, as I work still to learn the process. As another indication of our growth and development, we have recently migrated our website to the new GSA Connected Community platform. This change enables us to add discussion and interaction, while easily updating materials and design elements. Like our historians, we are indebted to our webmasters – both old and new – for their invaluable roles in sharing our news with each other and with the rest of the world! (continued on page 3)

Get ready for GSA 2016!
Abstract deadline July 12, 11:59 pm PDT
Quaternary Geology & Geomorphology Division
Officers and Panel Members – 2015/2016

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Management Board – 9 Members: Division officers and the Chair of the preceding year; also includes the Historian and the Student Representative.

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QG&G Division Liaison – Pamela Fistell
(Both appointed by the GSA President)

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Alison Duvall
Amy East

2015-2017 Panel
Amanda Keen-Zebert
Jeff Munroe
Stephanie Day

2015 JTPC Representatives:
Anne Chin, Glenn Thackray
From time to time, QG&G Chairs have raised concerns and focused attention on perceived threats to our discipline. These issues have included, for example, early concerns about the lack of prominence and respect given to Quaternary geology and geomorphology in academic departments and national and international research initiatives. Our field has also experienced dips, along with downturns in the economy, which raised concerns in regards to the loss of positions and resources in geoscience departments and the Geological Survey. Our Chairs have also challenged us to step up in response to these and other threats and offered potential solutions. To that end, a position statement was developed for applied fluvial geomorphology in regards to the expanding field of natural stream design that is unsupported by comparable academic training in the discipline. In response to a growing trend for Quaternary geologists and geomorphologists to prefer the AGU meeting, we now have the QG&G Kirk Bryan (KB) Field Trip. Not only does the KB Field Trip offer opportunities for intellectual exchange among colleagues, it anchors our annual meetings by highlighting the field problem as a unique feature of geomorphology and Quaternary geology. Our field and Division have clearly evolved over the years, as we have embraced change.

Of all the challenges raised in nearly six decades of QG&G newsletters, however, I did not see explicit discussion of the issue of diversity that is so important to the health and vitality of our Division, and indeed, to science. That is, diversity in our members that includes recognition of gender, ethnicity, sexual orientation, disability, and other forms of under-representation. I know that we think and care about this issue a lot. Great progress is evident in some key ways, especially pertaining to supporting and recognizing female students. For example, QG&G established the Marie Morisawa Award in 2006 to support promising women graduate students pursuing a career in geomorphology. Female students now comprise a sizeable proportion of applicants for QG&G awards. In 2014, the year that I chaired the student awards committee as Second Vice Chair, female students submitted 33 and 13 applications for the Mackin and Howard awards, out of 55 and 33 total, respectively. These students have competed well, as many of the student awards in the last few years have gone to women. A review of the list of recipients for student awards also shows representation by women since the early years. Clearly, we are doing something right with respect to training students toward a diverse work force for the future, even though women are only one of many under-represented groups in our field. Our efforts align well with, and perhaps respond to, repeated calls from the National Science Foundation (NSF) and the National Research Council in this regard, as articulated in numerous reports in recent years. They also meet requirements for research funding from NSF with respect to generating “broader impacts.”

Yet, we seem to have reached a point in our collective development and evolution, whereby recognizing diverse colleagues in awards at the professional level represents a timely challenge and opportunity. This was, in fact, the essence of the e-mail from the QG&G member that led me to develop this message. That colleague was distressed to see that so few of the recipients of our professional awards have been female. Indeed, our Division has given the Kirk Bryan Award to female lead authors in 2007 and 2009, out of 57 recipients in its history. QG&G has also recognized one female geomorphologist with the Distinguished Career Award in 2014, the 28th year of the award. Although our Division presented the El Baz Award for Desert Research to a third female recipient last year (out of 17), it was 11 years before diversity in gender appeared. The challenge of diverse representation can be similarly extended to elected leadership in QG&G. Since Marie Morisawa chaired QG&G in 1981, the Division has elected eight female geomorphologists into this role (a total of 15% of Chairs), with half of these Chairs serving in the last decade.

Rather than emphasizing the modest representation from diverse groups evident in our history, I prefer to bring attention to the opportunities that lie ahead for us as a discipline and Division. The increasing number and success of female students, along with the emergence of representation of women colleagues in elected leadership and in professional awards, leads me to think that we are coming of age. A generation of diverse Quaternary geologists and geomorphologists stand ready to contribute in ways greater than before. A larger pool of established colleagues now deserves recognition for their outstanding scholarship and years of professional service. The maturation of our discipline in this regard is also reflected in a corresponding historic moment in the Geomorphology Specialty Group of the American Association of Geographers, when it recognized the first female geomorphologist with the Distinguished Career Award in 2015 after 27 years. So
too, when I hit the March 1990 QG&G newsletter while combing through our archives, I was reminded that we now have more role models for minority groups that were once invisible. That newsletter recorded an acceptance speech from Clyde Wahrhaftig for the Distinguished Career Award, in which he revealed his experiences as a homosexual geologist, in hopes of facilitating greater acceptance and recognition of the contributions from the gay community. Here too, is our opportunity to embrace this message once again.

I therefore celebrate our increasing diversity and the positive signs of change. I celebrate how far we’ve come, even while recognizing that we have a long ways yet to go. I recognize too, not least from personal experience, the hard work and mentoring of a generation of forefathers who has nurtured scholars from diverse backgrounds and given them opportunities to pursue this science. As we stand at the brink of making more history together, let us affirm and re-affirm our commitment to a diverse science and community, one that stands focused on utilizing our knowledge and experiences of the past toward meeting the challenges of today and tomorrow.

This brings me to a last point in closing: what must we do individually and collectively to achieve greater diversity in our field and Division, not only diverse in gender, but in every way? Each of us must make a difference. We must, of course, continue to mentor students and junior colleagues with an outlook toward a diverse future. We must also nominate individuals for the Division’s professional awards and leadership roles, particularly deserving colleagues who are members of under-represented groups. Because members of the QG&G Management Board refrain from making nominations, the opportunity and responsibility lie with individual members of the Division. You, therefore, can truly make a difference! Additionally, if you are a member of an under-represented group, we especially invite and need your participation. Only by participating will we benefit from your perspective. By simply increasing participation across the board, we enhance diversity.

I thank you for the opportunity to serve as Chair this year. Please contact me with suggestions for how we can work together to make a difference for our Division!

Anne Chin
Chair, Quaternary Geology and Geomorphology Division

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**Division Awards - 2015**

The following awards were given by the Division at our annual awards ceremony
Tuesday, November 3, 2015

--- The Kirk Bryan Award ---

The Kirk Bryan Award for Research Excellence was established in 1951 & given for a publication of distinction (within the past 5 years) advancing the science of geomorphology or Quaternary Geology or a related field. Our 2015 award was presented to Daniel R. Muhs, Kathleen R. Simmons, R. Randall Schumann, Lindsey T. Groves, Jerry X. Mitrovica, and DeAnna Jean Laurel, 2012. Sea-level history during the Last Interglacial complex on San Nicolas Island, California: implications for glacial isostatic adjustment processes, paleozoogeography and tectonics. Quaternary Science Reviews 37, 1-25. doi:10.1016/j.quascirev.2012.01.010.

Citation by Margaret Berry
The Kirk Bryan Award for Research Excellence allows us to acknowledge and honor the authors of a recent publication of distinction. This year the award goes to Dan Muhs, Kathleen Simmons, Randy Schumann, Lindsey Groves, Jerry Mitrovica, and DeAnna Laurel for their 2012 paper entitled “Sea-level history during the last interglacial complex on San Nicolas Island, California; implications for glacial isostatic adjustment processes, paleozoogeography and tectonics”—published in Quaternary Science Reviews. This meritorious paper, which represents major advancements in both Quaternary geology and geomorphology, truly embodies
the spirit of the Kirk Bryan Award and is highly deserving of it. Published at a time when the understanding of past sea level rise has never been more important, the paper is also timely.

Lead author, Dan Muhs, has studied Quaternary sea-level history recorded by marine terraces in wide-ranging locations throughout the world. Muhs infuses his vast knowledge of this topic into the paper in a way that makes it an invaluable resource for the scientific community. With coauthors Simmons, Schumann, Groves, Mitrovica, and Laurel providing additional expertise, the paper takes a unique, multidisciplinary approach to address key issues related to Quaternary sea-level history on San Nicolas Island. The approach integrates coastal and tectonic geomorphology, geophysics, field mapping, geochronology, and paleozoogeography. The results are data driven, based on accurate and precise field measurements of past sea level indicators, 65 new U-series ages for corals, and thorough identification of the marine invertebrate fauna contained in the marine terrace deposits. Through this creative approach, the paper addresses key questions about the magnitude of sea level rise on San Nicolas Island during relative high sea level stands at 80 ka, 100 ka, and 120 ka, which has implications for global ice volumes at those times. It documents that paleotemperatures differed during the sea stands, and that individual terrace deposits can represent more than one sea stand. It also provides uplift rates that are directly applicable to earthquake hazard research for the Southern California coast, contributing to our understanding of active tectonics in an area that has a serious earthquake hazard.

Among all of the significant contributions this paper makes, perhaps one of the most far-reaching is its validation and refinement of the idea that glacial isostatic adjustment (GIA) processes cause an unequal response in sea level over long distances from melting ice sheets, and produce different late Quaternary sea level records from one geographic locality to another. For many years, the conventional approach for interpreting a suite of undated or partially dated marine terraces has been to assume global, eustatic sea level change, and to correlate the terraces to a reference sea level curve like that developed from the paleo-sea level record of Barbados or New Guinea. However, Muhs and coauthors demonstrate that glacial isostatic adjustment processes negate the existence of a global eustatic sea level curve, and that use of a curve developed from a geographic locality like Barbados or New Guinea to interpret sites at mid- to high latitudes in the northern Hemisphere will probably lead to false conclusions. Not only is this key to understanding past sea level rise and ice volume fluctuations, this result has immense implications for seismic risk assessment in places like the Southern California coast, where rates of uplift are often determined from marine terrace chronology.

This innovative, cogently written paper has wide-spread relevance to a number of sub-disciplines in the geosciences and will be an important contribution to Quaternary geology and geomorphology for years to come. It is a paper clearly worthy of the Kirk Bryan Award.

Response by Daniel Muhs
Good evening! It is an honor to receive this award and we have many people to thank. First and foremost, we would like to thank Margaret Berry, fellow geologist at the U.S. Geological Survey, who nominated us for the award. Thank you, Margaret, and thank you for your kind comments. We thank the Quaternary Geology and Geomorphology Division of the Geological Society of America for seeing fit to choose us to receive this prestigious award this year.

There are very few scientific studies these days that are the result of a single person’s efforts. Our increasing recognition of the complexity of the natural world requires that most scientific problems be tackled in a team effort and our work on the California coast is no exception. To my co-authors, then, I offer my heartfelt thanks. Kathleen Simmons generated many U-series analyses of tiny, dirty, hard-to-clean corals from San Nicolas Island that gave us our chronology. Lindsey Groves identified hundreds of often wave-worn or fragmentary fossils from deposits all over the island and worked out their paleozoogeographic significance. Randy
Schumann, DeAnna Laurel and I hiked up and down the canyons and along the sea cliffs to examine dozens of exposures in order to map the terraces, identify key geomorphic features, and get precise GPS elevations. Finally, Jerry Mitrovica, this year’s winner of GSA’s Arthur Day Medal, took time from a busy schedule to generate the first GIA model of sea level history over the last interglacial-glacial cycle for the California coast. What a talented group of people I have gotten to work with!

Through the course of my schooling and career, I have been fortunate in having wonderful teachers and colleagues. Despite going to two landlocked universities, I was lucky to have professors who shared my interest in the California coast and conducted some of the pioneering studies of marine terraces there. At the University of Illinois, I studied with the late Don Johnson, who had worked on the marine terraces of the Channel Islands. Don kindled my first interests in the Earth sciences and passed on his love of the Channel Islands to me. My first geomorphology course at the U. of I. was from Chuck Alexander, who did a now-classic study of the terraces near Santa Cruz, California, and articulated, for the first time, our current understanding of the relations between terraces, tectonic uplift, and sea level history. At the University of Colorado, where I did my Ph.D. work, I was fortunate to have Pete Birkeland as my advisor. Pete’s mapping of the marine terraces at Malibu still stands as the definitive work of that area. Also at CU, I worked with Bill Bradley, who studied the marine terraces around Santa Cruz. He is one of the few geomorphologists who excelled at both process-oriented studies of marine terrace formation and their context in Quaternary sea level history. I could not have picked four better teachers.

At the U.S. Geological Survey, I was introduced to uranium-series dating by John Rosholt, who hired me. John was one of the discoverers of uranium-series disequilibrium. He was a patient teacher who took time to teach uranium isotope systematics to a field-oriented, dirt geologist. For gaining an understanding of uranium-series geochronology, right from the beginning, I was learning from the best.

The U.S. Geological Survey has been extremely supportive of our work on the world’s coastlines through our “Geologic records of high sea levels” project, supported by the USGS Climate and Land Use Change Research and Development Program. We thank the program for its support of our efforts in learning sea level history.

For our field work on San Nicolas Island, we thank the U.S. Navy’s Range Sustainability Office of Naval Base Ventura County. U.S. Navy archaeologists Lisa Thomas and Steve Schwartz of that program have arranged countless trips to the island, facilitated transportation and logistical support, and have provided good company and lots of humor in the field. Thank you Lisa and Steve!

Finally, thanks go to my wife Tracy. She helped me in the field the first summer I worked on the marine terraces of San Nicolas Island, a long time ago. She has always been supportive of my work and shares my love of the California Channel Islands.

Past winners of the Kirk Bryan Award have been prestigious scientists who have been role models for us. In receiving this award, we are honored to be in such distinguished company. Some of us were fortunate to have Kirk Bryan Award winners as our own teachers. Pete Birkeland (KBA in 1988) was my advisor; Stan Schumm (KBA in 1979) was Randy’s advisor; Ellen Wohl (KBA in 2009) is DeAnna’s current advisor. We are very honored to be counted among these illustrious scientists. Thank you!

--- The Distinguished Career Award ---

The Distinguished Career Award was established in 1985. It is presented to Quaternary Geologists and Geomorphologists who have demonstrated excellence in their contributions to science. We presented the 2015 award to George Denton, University of Maine.

Citation by Thomas Lowell
George H. Denton is a strong candidate for the Distinguished Career Award. During his career, George has identified patterns of millennial climate change, undertaken a global synthesis of glaciers at the Last Glacial
Maximum, ignited debate about the distribution of former ice sheets, and identified complex linkages among various elements of the climate system. His efforts, on these and other projects, have generated excellent research that keeps the field of Quaternary Geology relevant to society as we enter the Anthropocene.

George has a global perspective on Quaternary problems. As an undergraduate at Tuffs University, George was invited by Robert Nichols to join him on expeditions to Antarctica in 1958/1959 and again in 1960/1961. These were the first two of what would turn out to be 30 field seasons on the ice. In 1962, George began graduate studies at Yale University and fieldwork in the St. Elias Mountains of Alaska and the Yukon. For several years, fieldwork there and in the Dry Valleys were interweaved establishing a bi-polar perspective that still underpins the scientific questions that George addresses.

In Alaska and Lapland, George and Wijorn Karlen uncovered alternating intervals of glacier expansion and contraction that were thought to indicate broad climatic trends in both the Holocene and the latest Pleistocene. These were linked to short-term atmospheric radiocarbon variations, which implies that solar activity may have been involved. Despite the ~40 years that have passed since the introduction of this concept, it remains a framework for understanding climate change on millennial time scales.

George has conducted most of his fieldwork in the Southern Hemisphere. He would argue that the relative lack of study there, in contrast to say the North Atlantic region, masks the importance of Antarctica and the southern oceans in climate changes during the late Cenozoic.

His early work in Antarctica indicates that glaciations there had been underway since pre-Quaternary times, and thus, many of the landscapes there are extremely old. Preservation of old landscapes implies that glacial erosion may be ineffective under some conditions. The antiquity of glaciated landscapes has subsequently been a theme in debates about the timing of pre-Quaternary development of the East Antarctic Ice Sheet and has surfaced in discussions about the extent of former Northern Hemisphere ice sheets. Antarctica has been a harsh training ground for a steady stream of students passing through the University of Maine.

In the mid-1970’s, George became a member of the CLIMAP project that sought to map the surface of the Last Glacial Maximum world. George was responsible for reconstructing the distribution of both ice sheets and mountain glaciers on a global scale. At the same time, a glaciologist named Terry Hughes joined the newly-formed Institute for Quaternary Studies at the University of Maine. Subsequent collaborative work allowed George to combine observational data from extensive mapping in Antarctica with the theoretical underpinnings of the behavior of ice sheets. Together George and Terry published “The Last Great Ice Sheets” in 1981. It laid out the case for the importance of marine ice sheets in both polar hemispheres. Ice sheet features such as domes, saddles, converging ice streams, grounding lines, and ice shelves are presently undergoing intense scrutiny because of their impact on sea level. In 1981, however, such features were unknown to most Quaternary geologists. It is no surprise then that the “The Last Great Ice Sheets” lead to discussion, debate, and renewed research.

During the mid 1980’s, George started discussions with Wally Broecker at Lamont Doherty Earth Observatory about integrating the mountain snow line and marine records. This led to hypotheses about the linked behavior of the ocean and the atmosphere. One concept stemming from those discussions was that transitions from glacial-to-interglacial conditions involve jumps between stable modes of circulation of both the ocean and atmosphere and not simply seasonal insolation changes. A second concept is that seasonality contrasts are linked to threshold conditions and played a role in the...
abrupt climate changes so characteristic of glacial times. Most recently, millennial-duration fluctuations are proposed to result from changes in the strength of the Atlantic conveyor circulation. No matter how these suggestions turn out, they have provided new ways to think about how climate mechanisms work.

Concepts such as these require testing. The re-organization idea implies phasing relationships between the northern and southern hemispheres, so in the early 1990’s George started working in the lake district of Chile. In the late 1960’s, George shared an office with Calvin Heusser at the American Geographical Society. Based on this relationship, a natural collaboration involved mapping and dating the glacial geomorphology and collection of numerous lake and bog cores for pollen analysis. This allowed for comparison between glacial extents and environmental conditions recorded in the pollen record.

This project lasted nearly a decade. It uncovered evidence that full glacial conditions lasted longer than the commonly assumed Last Glacial Maximum and that some inter-hemispheric symmetry existed during the termination. This implies that a key linkage must be in the atmosphere.

Just to double-check the results from Chile, George went up wind some 8,500 km across the South Pacific to New Zealand. Again detailed mapping of the moraine patterns, conducted by long-time co-worker Bjørn Andersen, was the framework upon which the chronology of snow line changes could be reconstructed. Here, the best clock turned out to be surface exposure age dating. Over more than 15 years, George nudged this methodology to a new standard in terms of quantity and quality of dating. Results from New Zealand are still coming on-line, but it appears that most of the warming occurred there in what is called the Heinrich Stadial of the North Atlantic. This supports the importance of shifts in ocean circulation belts during the last glacial termination. Such evidence from New Zealand has returned George to a core question he has puzzled over most of his professional life - “What caused the greatest warming of the late Quaternary - the Termination”. It may be the answer is in hand or not, but his on-going collaborations with workers in oceanography, climate modeling, stable isotope geochemistry, and ice cores, has moved the Quaternary community toward an answer.

George is not slowing down. In the last 5 years, he orchestrated significant research across a wide spectrum of Quaternary problems in diverse areas. A partial list of recent contributions include: a history of the grounded ice sheet during the Last Glacial Maximum in the Ross Sea sector of Antarctica, temperature reconstructions for the Last Glacial Maximum and late glacial of New Zealand, warming during the late glacial in New Zealand, Holocene cooling patterns in east Greenland, retreat of glaciers in southern most South America during Heinrich Stadials, late glacial chronology in Patagonia, millennial-scale reorganizations of Southern Hemisphere circulation patterns, production rates of 10Be, Holocene glacier fluctuations in New Zealand, and of course the Termination. Along the way, he has always worked with a team and promoted the careers of young scientists.

George Denton’s involvement in Quaternary Geology started some 56 years ago with a trip to Antarctica. Since then he has labored to generate quality records of climate change. Field areas stretch from Beardmore Glacier in Antarctica to Scoresby Sund in Greenland; several places in between that are hard to find on a map. During his career, he has changed the way Quaternary geologists look at marine ice sheets; proposed outrageous hypotheses; tied the atmospheric snow lines with ocean circulation patterns; and worked on problems of interest to virtually every Quaternary geologist. In addition to his distinguished research career, George has inspired generations of students, many of whom become researchers themselves. Being one recipient of such tutelage, it is my privilege to nominate George Denton for the Quaternary Geology and Geomorphology Division Distinguished Career Award.

Response by George Denton

I am very appreciative to the GSA Division of Quaternary Geology and Geomorphology for having my name added to the list of recipients of the Distinguished Career Award. Particularly so because I have such high regard for all the persons on that list, many of whom I know well. For example, Dick Goldthwait helped me in my early years in the St. Elias Mountains. Steve Porter and Ken Pierce were fellow graduate students at Yale,
and Link Washburn was a thesis advisor. John Andrews was patient with me and taught me much about the Arctic when he took me there on a field trip.

I have been very fortunate to have had a lot of help in my career. Bob Nichols and Charlie Stearns at Tufts University were very supportive in my early years. Both were students of Kirk Bryan at Harvard. Bob took me twice to Antarctica as a field assistant. This started a long and interesting 30 years of field work on that continent, supported by the National Science Foundation. Joe Hartshorn, also a student of Kirk Bryan, took me under his wing one summer while I was at Tufts. At the time, Joe worked from the Boston office of the USGS. Along with Carl Koteff, Joe taught me many aspects of field mapping of glacial deposits in New England. In particular he focused my attention on the importance of morphosequences. This stood me in good stead during my years of mapping morphosequences of glacial deposits in the Andes and the Southern Alps. Bjorn Andersen of the University of Oslo taught me much about the glacial geology of Norway, and we subsequently worked together for many years in CLIMAP, South America, Antarctica, and New Zealand. Dick Flint and Link Washburn guided my graduate work at Yale. Gary Comer of the Comer Science and Education Foundation was very supportive of students undertaking research in the field of abrupt climate change. He was particularly interested in the glacial history of Greenland. Together we took memorable trips to Scoresby Sound in East Greenland and to the fjords of south Greenland. Wally Broecker early recognized the value of mountain snowlines in reconstructing ice-age climate, and has long been a strong supporter of such research.

Over the years I have been blessed with many fine students, and I thank them all. Finally, I could not have carried out research in South America without the invaluable aid of my good friend and neighbor on the coast of Maine, Charlie Porter. Charlie greatly aided our work in the Lake District of Chile. Also, Charlie and his boat Ocean Tramp made it possible to conduct research in the Cordillera Darwin and the fjords of Chile west of the Southern Patagonian Icefield. I will always be grateful to Charlie for his kindness and help.

--- The Farouk El-Baz Award for Desert Research ---

The Farouk El-Baz Research Award was established in 1999 and given for outstanding work in the field of warm desert research. The award is intended to encourage and reward arid-land studies. The 2015 award was presented to Marieth Reheis of the U.S. Geological Survey.

Citation by Jeff Pigati

For all who know her, she is the Queen of the Desert.

Dr. Marith Cady Reheis, my collaborator, my mentor, and my friend, has been working in the deserts of the American Southwest for more than three decades. In a time when intense specialization has become the norm, Marith has conducted seminal research in a wide array of topics that include:

- the stratigraphy of alluvial, pluvial, and eolian deposits
- determining the sources, chemical composition, and mineralogy of regional dust
- the origins and rates of desert soil formation
- the hydrologic characteristics of wet and dry playas, ancient river systems, and pluvial lakes
- the relation between tectonics, geomorphology, and landscape evolution

...and so many more.

Her experience and breadth of knowledge of desert processes and landforms, combined with her unparalleled skill in the field, keen eye for detail, and appreciation for the big picture, are both inspiring and remarkable.

Marith began her career with the U.S. Geological Survey in the late 1970's, mapping coal beds in western Colorado, but soon found her true calling – conducting geologic research in the hot deserts of the American Southwest. For more than thirty years, she maintained a network of dust traps spanning several states with the goal of understanding the chemistry and physical characteristics of modern dust, and how dust influences
desert soil processes on geologic timescales. These efforts have helped shape our understanding of dust-soil interactions in aridlands worldwide.

To me, her work on reconstructing pluvial lake levels in the western U.S. using old-school, outcrop-based geology is where the magic has really happened. In fact, Marith once told me that doing field work and figuring out geological problems were the very reasons that she was put here on Earth. Having seen her in action many times, I don’t doubt that for a minute.

A few years ago, when she first introduced me to the Manix Basin in southeastern California, she pointed out that her study area spanned essentially as far as the eye could see in every direction. The size of the basin and complexity of the deposits were simply overwhelming. After a few minutes of stunned silence, I asked her – “Marith, where did you even begin?” She replied, as a matter of factly, “Oh, you know, it takes a little while, but eventually you figure it all out.” Over time, and in a way that only Marith can, she did exactly that.

Finally, a citation like this would not be complete without at least a brief mention of her loyalty and dedication to the Pacific Cell of the Friends of the Pleistocene. Over the years, she has led countless field trips and stops that have covered topics that are too numerous to count. The days are great, but we all look forward to the evening campfires when Marith breaks out her banjo and debuts one of her new geology songs, along with covering a list of classics. As her friend and colleague Ken Adams put it, the group singing of “Call Me Doctor” is a rite of passage for every newly-minted Ph.D. that attends these trips. And trust me, there’s nothing quite like it!

So, without further adieu, it is my honor and privilege to announce a most deserving recipient of the 2015 Farouk el-Baz Award for Desert Research. She is a friend of the desert. She is a friend of the Pleistocene. And she is a friend to us all. Ladies and gentlemen, Dr. Marith Reheis.

Response by Marith Reheis

Thank you, Jeff, for your kind words and this nomination, and thanks to all who wrote in support—some of whom are distinguished previous recipients of this award. In particular I would like to thank Farouk El-Baz for his generosity and inspiration in establishing this award for warm-desert research, and the Quaternary Geology and Geomorphology Division for their recognition.

Who would have thought that setting up cake pans full of marbles could lead this far? Perhaps it was wading through the kudzu of the Georgia countryside as an undergrad, trying to find any outcrop in the saprolite, which drove me to the desert. At least, it got me to Colorado, but then why did I veer away from studying glaciers and glacial deposits in favor of the Mojave Desert? Looking back, it probably started in between graduate degrees when I was mapping coal for the USGS. I sat in on an Advanced Geomorphology field trip to the Mojave led by John Andrews, Ed Larsen, Ted Walker, and Pete Birkeland. It was love at first sight for the Granite Mountains, Kelso Dunes, Cima Dome, and Death Valley, though it took a long time and a winding road to work there. It seems that every step along that road was unplanned, yet somehow inevitable. I worked on a gypsum soil chronosequence in the Bighorn Basin of Wyoming for part of a dissertation. Looking at those gypsum soils, Pete said “Well, I guess you’d better set up a dust trap the way
Gile and Hawley did in New Mexico!” So that was the start of the dust traps. They were later replaced by angel-food cake pans mounted on steel fence posts (thanks to Emily Taylor for the cake pan suggestion!), which were much cheaper and easy to replace when beaten down by cows or shot up by passers-by. Because of that graduate work and the efforts of Jennifer Harden and Denny Marchand, I was hired back by the USGS to work on soil chronosequences, dust inputs to soils, and Yucca Mountain. The first years of dust-trapping were epic 4-week adventures with many different field assistants, for there were 60-some sites scattered from the Mexican border to Tonopah and from Los Angeles east to Utah. It took four weeks just to reach them all. Many of those original sites are still there; if anyone wants to take them over, let me know! Sampling the dust traps gave me an invaluable geographic perspective on a large desert region. And, they led me to Fish Lake Valley on the Nevada-California border and a 7-year project wallowing in pure geologic enjoyment. Along with Janet Slate and others, we deciphered its stratigraphy, tectonics, and paleoclimate record, with the invaluable aid of Andrei Sarna-Wojcicki and the Tephrochronology Lab, who sorted out hundreds of tephra layers. And it was finding evidence for a middle Pleistocene pluvial lake in Fish Lake Valley that pushed me into work on the older Pleistocene record of pluvial lakes of the western Great Basin and eventually, back to the Mojave Desert. Studies of Lake Manix and Lake Tecopa were built upon the foundations of many other geologists, including George Jefferson, Norman Meek, Dave Miller, and yes, Roger Morrison himself!

It’s been quite a ride and I’ve enjoyed it all—well, maybe not so much dealing with statistical analyses of the dust data! My heartfelt thanks to all the folks who helped me in the field and in the lab, to my friends of the soil circle, and to my husband, John Cady, who supported me in my career and long absences in the field. And I thank the USGS for allowing me and other enterprising scientists to follow their research instincts through surprising twists and turns (within funding limits, of course!).

--- Gladys W. Cole Memorial Research Award ---

The Gladys W. Cole Memorial Research Award is restricted to investigation of the geomorphology of semi-arid and arid terrains in the United States and Mexico. It is given each year to a GSA Member or Fellow between 30 and 65 years of age who has published one or more significant papers in geomorphology. The fund was established in 1980 by Dr. W. Storrs Cole in memory of his wife. The first award was presented in 1982. The 2015 award was given to Lyman Persico, Whitman College, for his proposal The role of rock type and dust in the development of hillslopes in the Sandia Mountains, New Mexico.

The Quaternary Geology and Geomorphology Division management board thanks the following people for their help in evaluating this year’s award applications: Phillip Armstrong, Julio Betancourt, Julie Brigham-Grette, Jason Briner, Doug Clark, Juliet Crider, Craig Dietsch, Tim Fisher, William C. Johnson, Ben Laabs, Eric Leonard, Grant Meyer, Fred Phillips, Will Scott, Mary Seely, Jim Spotila, and Thad Wasklewicz.

Gladys W. Cole Award winner Lyman Persico
--- Student Research Awards ---

Our division offers three student awards each year: The **J. Hoover Mackin Research Award** was created in 1974 to support graduate student research in Quaternary geology/geomorphology. The **Arthur D. Howard Research Award** was established in 1992 to support graduate student research in Quaternary geography or geomorphology. The **Marie Morisawa Award** was established in 2006 to support promising female graduate students in geomorphology.

--- J. Hoover Mackin Award ---

The 2015 Mackin Award for PhD research was given to **Marina Foster**, Arizona State University, for her proposal *Role of climate and tectonic in colluvial soil production: Testing the soil production paradigm using observations in uplifted landscapes of California and southeastern Arizona*. Advisor: Kelin Whipple.

--- Arthur D. Howard Award ---

The 2015 Howard Award for MS research was given to **Mariah Richards**, Colorado State University, for her proposal *Sediment transfer and morphologic change detection using a spatially and temporally varied dataset, Toklat River, AK*. Advisor: Sara Rathburn.

--- Marie Morisawa Award ---

The 2013 **Marie Morisawa Award** was given to **Sarah Schanz**, University of Washington, for her proposal *Strath terrace formation through changes in sediment retention in the Pacific Northwest*. Advisor: David Montgomery.
--- Robert K. Fahnestock Memorial Award ---

The Fahnestock Memorial Award from GSA honors the memory of the former member of the Research Grants Committee, who died indirectly as a result his service on the committee. The award is given for the best proposal in sediment transport or related aspect of fluvial geomorphology. The 2015 recipient was Charles Shobe, University of Colorado Boulder, for his proposal Bigger than bedload: Size distribution, residence time, and channel evolution implications of bedrock blocks in rapidly incising rivers. Advisor: Gregory E. Tucker.

--- The John Montagne Fund ---

The Montagne Fund was established in 2000 to support one student’s research in Quaternary geology and geomorphology. The 2015 recipient was Jotautas Baronas University of Southern California, for his proposal Germanium isotopic composition of river water as a potential paleo-weathering proxy. Advisor: Douglas Hammond.

--- The John A. Black Award ---

Through the Black Family’s generosity, the Black Award for coastal geomorphology was given for the first time this year. The inaugural recipient was Ryan Frazer, University of North Carolina Chapel Hill, for his proposal Neodymium isotope systematics of zircon reveal scale and timing of contamination of Grizzly Peak Tuff, Colorado. Advisor: Drew Coleman.

Division Elections

Your voice is important in our upcoming June election. In order to help you make an informed choice, here are the biographies for the two candidates for Second Vice Chair. The Second Vice Chair serves one year, before running for election for First Vice-Chair, then Chair and Past Chair.

Second Vice-Chair 2016-2017 (1 year term)

Management Board Meeting Minutes
Sunday, November 1, 2015
7:00 PM-9:00 PM, Baltimore Convention Center Room 306, Baltimore, Maryland

Attending:
Management Board: Alan Nelson, Past Chair; David Dethier, Chair; Anne Chin, 1st Vice Chair; Glenn Thackray, 2nd Vice Chair; Tammy Rittenour, 2nd Vice Chair elect; Scott Burns, Treasurer; Sarah Lewis, Secretary; Dennis Dahms*, Newsletter editor/Webmaster; Anne Jefferson, Newsletter editor/Webmaster elect; Thom Davis, Historian; Rachel Valletta* Student Representative; Lee Corbett, Student Representative elect


Other attendees: Sarah Schanz 2015 Morisawa award recipient
*Sent regrets for not attending

Meeting was called to order at 7:30pm and began with introductions.

GSA Division Chair’s Meeting Report: David Dethier (Chair) gave a summary of the division chair’s meeting held Saturday, October 31st. This information is supplemented here by notes provided by GSA to the division. The 2015 Baltimore meeting counted 4700 submitted abstracts (1995 with student first authors) and over 7400 attendees. This year is the QG&G Division’s 60th anniversary. We are GSA’s 6th largest division, with our membership of ~1600 steady over the last two years. Email opening/reading by members is up from an average of 36% last year to 45% this year; this increases to 47% for the emails announcing newsletters and ballots. Compared to other division, QG&G sends relatively few messages to membership.

Items on the chairs’ meeting agenda of note to the division included: (1) Discussion of the transition of GSA journals to Open Access (target date of 2020), with options for compensating for the resultant loss of 1/3 of GSA income potentially including raising membership fees, raising costs to publish in journals and fundraising through GSA Foundation. There was not a clear path forward presented. (2) Slight (2%) loss in GSA membership last year, with expressed interest in attracting students and retaining early career and young professionals. (3) Role of Interdisciplinary Interest Groups (IIG) with respect to the divisions is a work in progress, with the emphasis being more nimble, shorter term, with a focus not represented among the divisions. (4) The procedure for sunsetting divisions still being developed. (5) The 2016 Denver meeting will be held early (September 25th-28) to avoid overlapping with the presidential election. (6) Our new division liaison to GSA Council is Frank Pazzaglia.

Treasurer’s report: Scott Burns (Treasurer) reported that in fiscal year 2015 (July 2014 to June 2015) the Division had a total income of $12,531, and total expenses of $10,610 for a net gain of $1,921. For fiscal year 2016, Scott presented a budget having projected income of $9000 from dues, $2500 from donors, including a $1000 subsidy for students for the Kirk Bryan field trip, and projected expenses of $10,765, including IAG dues of $665 for a projected surplus of $735 (see attached report). Scott is approaching the AGU Earth & Planetary Surface Processes group with to ask to further share the financial responsibility for paying these dues. As of June 2015, the Division has total reserve assets of $6960. A portion of these assets ($4403) is set aside as deferred dues to cover expenses incurred prior to the collection of dues. Scott presented a review of the QG&G accounts with GSA Foundation. All accounts have continued to grow, and the Kirk Bryan and Howard Awards are no longer in need of support from the division budget. The reserve fund should continue to grow, and there is no need to raise dues.

Student Award Evaluation Procedure: Glenn Thackray (2nd Vice Chair) provided an update on the student award evaluation process revision, initiated last year due to the increasing numbers of student proposals received for evaluation by the division. In 2015, there were 57 Howard Award proposals and 57 Mackin Award
proposals, up 30% overall from 2014. Each proposal received 2 reviews, and then the top 5 overall went to the entire panel of 14 reviewers. While this approach was an improvement over previous years, discussion followed regarding how to increase the number of initial reviews and standardize the criteria for evaluation. A recap of the 2013 decision to not award honorable mention resulted in an agreement to continue to not award honorable mention for the student awards. Various additional suggestions were made for possible improvements next year, and Tammy Rittenour (incoming 2nd Vice Chair) will work with Glenn to update the procedure for spring 2016.

**John A. Black Award:** Through the Black Family’s generosity, the Black Award for coastal geomorphology was given for the first time this year. The QG&G student award evaluation committee was prepared to receive applications and review them in the same manner as the Mackin, Howard, and Morisawa Awards. However, the 2015 award was selected by the GSA Committee on Research Grants, and QG&G was informed of the winner, similar to the Montagne and Fahnestock Awards. 

*Action item (Scott): Review award documentation to determine the intent of donor in the selection of the Black and Schumm awards.*

**QG&G webpage:** Anne Jefferson (Webmaster-elect) provided an overview of plans for the new QG&G website. After trying to find the resources to redesign on our own over the past few years, it has become clear that the smoothest option forward is to utilize GSA’s Connected Community, now able to host division websites. A preliminary site has been developed, and Anne solicited feedback on what additional content the board would like to see beyond what is already on the old website (http://rock.geosociety.org/qgg/). Requests included a history page, connectivity to social media (Facebook, Twitter, blog roll), a place to donate to the division and QG&G award foundation accounts, a GSA journal roll for QG&G authors, and a place for timely announcements. This will be a work in progress for the next year with a soft launch in early 2016.

**Division T-shirts & Hats:** The T-shirts and caps will be available for a suggested donation of $15 each at the Awards Ceremony on Tuesday night. We are out traditional style baseball hats and women’s XL Tshirts. There were also repeated requests for men’s XXL, as the shirts tend to run small. The 2 large boxes containing the remaining items will be stored by GSA and delivered to the 2016 Denver meeting. Note: Mary Kerns of GSA reported that we distributed 29 items in the 2 hour window at the awards ceremony on Tuesday night, for a total of $435.

*Action Item (all): Should the division invest in additional T-shirts and hats to replace the sizes we are sold out of?*

**Joint Technical Program Committee and Session Chair Process:** There was an extensive dissection of the collective experience of the 2015 process by the JTPC reps and those acting as session chairs. The overarching message is that the process needs improvement, specifically in: (A) Flexibility in scheduling/timing of decision making. (B) Clear understanding who is responsible for jointly sponsored sessions (C) Improved communication among participants during session approval/submission (D) Ability to create balanced sessions with current abstract submission/approval process.

*Questions/Suggestions for JTPC reps:*

- What flexibility is there with the current system to modify the process?
- Drop “oral only” as an option when submitting an abstract. This allows the session chairs wider latitude to balance sessions.
- Lengthen the time window between session proposal submission and program finalization, and abstract submission and session scheduling.

**Miscellaneous**

- Lee Corbett accepted her appointment to the QG&G management board for and will act as the QG&G representative to the Student Advisory Council (SAC). Her notes from that meeting are available on request.
- Interest was expressed in more actively nominating QG&G members for GSA Fellowship. Scott Burns and Thom Davis will look into this for 2016.
- The update of the Groundhog Day Document Update is proceeding more slowly than anticipated, and will be ongoing in 2016.
• Anne Chin brought a request from Allan James (AAG & University of South Carolina) for QG&G support in the development of a joint bid for the 2021 IAG meeting, preferably in western North America. The board recommended that this request be made at the Tuesday night Award Ceremony to solicit interested individuals and groups.
• We thank outgoing Past Chair Alan Nelson, Newsletter Editor Dennis Dahms, Student Representative Rachel Valletta, and 2013-2015 Panel Members Amy Brock-Hon, Gregory Hancock and Andrew Wilcox for their service to QG&G.

**Business Meeting and Award Ceremony:** The annual awards ceremony was held Tuesday, November 3rd, 2015, 7-11 PM at the Baltimore Convention Center. In addition to presenting the Division’s student and professional awards, the management board provided an update to the membership on the financial status of the division and solicited nominations and proposals for the coming year and the Denver 2016 meeting.

Meeting adjourned at 9:10 pm

**Obituary: David R. Bedford**

Dr. David Ralph Bedford, 42, passed away on March 15, 2016 at his home in Pacifica, CA due to complications from a rare form of brain cancer. He is survived by his wife, Shivani Ganguly, and his beloved pets, Hannah and Monster. Dave received his B.S. in geology from Colorado State University at Fort Collins in 1996, and earned his Ph.D. at the University of Colorado at Boulder with a dissertation “Effects of vegetation-related soil heterogeneity on runoff, infiltration, and redistribution in semi-arid shrubland and grassland landscapes” in 2008.

Dave was a Research Geologist at the United States Geological Survey in Menlo Park, CA. His 19-year career at USGS was marked by a diverse portfolio of research that reflected his fascination with many kinds of earth science. He published on active faults and folds, intrusion of granitic plutons, models for ecological systems, how moisture control by desert soils influences plant pattern and species composition, marine terrace evolution, and the role of flood-derived sand in stabilizing archeological sites in Grand Canyon. Dave loved the science of geologic mapping and published many high-quality bedrock and surficial geologic maps of diverse parts of the western U.S. He also was smitten by the importance of long-term monitoring, establishing environmental monitoring networks in several states. Dave also was adept at developing GIS-based models of geomorphic processes, which he integrated with his geologic maps and environmental data. Much of his work was interdisciplinary and was focused by the need to deliver meaningful results for Federal and State agencies. His legacy in the earth science literature stands at 43 technical presentations and 31 published maps, book chapters, and journal articles.

In addition to geology, Dave loved to explore and enjoyed food, nature, and music. He was an avid traveler, visiting much of the U.S. and exploring other countries when the opportunity arose. Dave was also a devoted sailor, a builder and flyer of model airplanes, a gardener, and a lover of music. Given more time, he would have sailed around the world.

Join us on-line. Check out our new website and connect with fellow QGG members!

http://community.geosociety.org/qggdivision/home
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