NAGT Geo2YC Division

FOUNDATIONS

Newsletter of the Geo2YC division of the National Association of Geoscience Teachers
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Back to the Ice!

by Jacquelyn Hams
Los Angeles Valley College

In 2008 I thought I was the most fortunate person in the world to be selected to go to the Dry Valleys of Antarctica as a PolarTREC teacher. I worked with Dave Marchant of Boston University on dating ancient buried ice in Beacon Valley, Antarctica – a dream project for a geologist. Since that time, we have been collaborating via videoconferences with my geology classes, developing lesson plans and launching Virtual DESERTS, a website containing data from the meteorological stations in the polar desert of Antarctica and subtropical desert of L.A.

I had a variety of wonderful educational and travel opportunities as a result of my first PolarTREC experience including winning the first GSA Photography contest for my photo of glacial crevasses. Just when I thought things don't get any better than that, I have the opportunity in 2012 to return to Antarctica. This time we will be using Ground Penetrating Radar and LIDAR to investigate the buried ice and landscapes of the Beacon Valley and the Asgard Ranges.

Follow along with Jackie's adventures this winter at http://www.polartrec.com/expeditions/buried-ice-in-antarctica-2012

Team Teaching a Geological Field Course in the Canadian Rockies

by Pete Berquist
Thomas Nelson Community College

For the past three summers, Callan Bentley from Northern Virginia Community College (Annandale campus), and I, from Thomas Nelson Community College, have brought students from Virginia to the Rocky Mountains of Montana and Wyoming for a two-week, four-credit field geology course. At the end of each course, our students have asked for more, so this past summer, Callan and I again headed west, but also north, with 18 students from our two community colleges, and explored the geology of the Canadian Rockies. This year's field course was phenomenal in many regards.

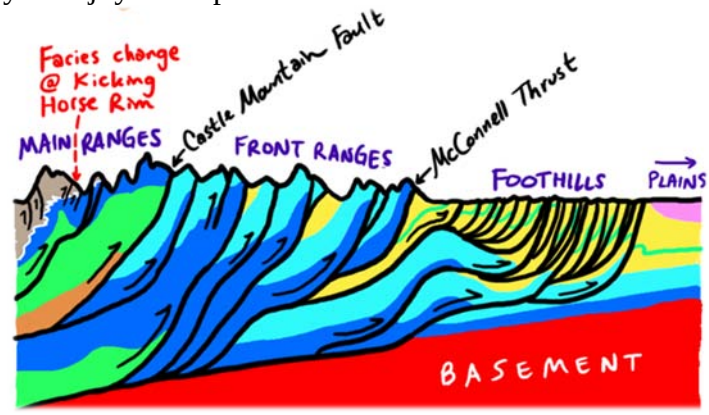
The 2012 class poses at Moraine Lake in Banff National Park, Alberta.

We were fortunate to have a wonderful crew of students. Per "typical" community college classes, our students ranged from some just out of high-school to others well into their second career or enjoying retirement. Beyond diversity in age, some students had never left the east coast, while others were savvy world travelers. While we initially

developed this course for veterans of our other field course (Geology of the Northern Rocky Mountains), we opened this course to students with limited field experience and geologic coursework. Despite any differences, all were eager for the opportunity to be immersed for 14 days in the geology of the Canadian Rockies.

Two colleges, two instructors, one class: Berquist and Bentley on the hike up to the Walcott Quarry in the Burgess Shale, Yoho National Park.

We flew in and out of Calgary, Alberta, and logged a total of ~1500 miles exploring geologic provinces within and around the Canadian Rockies. Our first few days were east of the Rockies proper, in the Great Plains, underlain by Cretaceous-aged sediments deposited in and adjacent to the Western Interior Seaway. These preserved numerous dinosaur fossils. Students quickly learned the realities of a field course: in this classroom you are likely to get sunburned, possibly dehydrated, devoured by mosquitoes, be "in class" for 8 hours or more, and take exams on picnic tables with the aid of a headlamp. But on the flip-side, the scenery beats any image presented on any PowerPoint slide projected onto some glossy Smartboard. And can you enjoy a campfire after class!



After a visit to the Royal Tyrell Museum (a must-see if ever in Alberta) and discovering vertebrate fossils on our own, we headed west to more rugged topography and a greater diversity of geology. To help prepare students for this trip, we assigned a pre-trip research project, on topics that we would encounter along the way. Students each created a two-page primer stocked with tasty geologic details of their topic, and then presented more information about their topic at camp or in the field. The goal of this assignment was for students to become experts in one aspect of the course and bring everyone else up to speed.

In addition to learning about each other's research topics, students gained experience taking detailed field notes, learned how to collect data in the field (measuring strike & dip, plotting their location on a map, etc), and were exposed first-hand to the Canadian Rockies' structural, sedimentary, and geomorphological history. Interspersed with "typical" field-like instruction (describing and interpreting outcrops), we were able to meet up with local and regional experts, allowing our students different perspectives than their instructors.

Upon returning to Virginia, students created their final projects. Their goal was to choose an outcrop from the course, describe the exposure in detail, and then start building interpretations at expanding scales (from local to regional), eventually drawing connections to how this one particular outcrop contributes to the overall understanding of the Canadian Rockies. The final product is presented in a web-based format and summarizes students' big-picture understanding of the Rockies.

Regional Field Geology students discuss the stratigraphy of the Horseshoe Canyon Formation with geologist Dave Eberth from the Royal Tyrrell Museum in Drumheller, Alberta.

Our field courses end up being good experiences for Callan and I, too. We often leave invigorated from being immersed in geology and from seeing different perspectives shared by our students and colleagues along the way. We also reaffirm how worthwhile it is to expose students to fieldwork and to venture out beyond the classroom. This year threw us some new challenges (including new terrain, extreme weather, and a medical emergency) that reinforced the necessity to run courses like this with ***two*** instructors, rather than just one.

Preliminary feedback from our students substantiates that our students felt their two-weeks exceed their expectation. And how could it not? We hope you have the opportunity to find a similar same sense of satisfaction at some point during your semesters this academic year. Hope to see you in the field!

Campus Museums I

A Little Known Gem: The Story of Our Campus Geology Museum

by Sheila Swyrtek
C. S. Mott Community College

Located in the city of Flint, MI, Charles Stewart Mott Community College is home to the Chester H. Wilson Geology Museum, a wonderful collection of over 2000 mineral, rock and fossil specimens.

The geology museum at Mott Community College got its humble start back in 1959 in the form of just a few hallway displays constructed by faculty member Ben Moulten. Throughout the next ten years new displays were added and the collection grew further under Wayne Haglund. During this period, the museum acquired what is now the centerpiece of its collection, an exceptionally well-preserved mammoth skull and tusks, excavated locally in 1962 by faculty and student volunteers from the college.

A look at the Chester H. Wilson Geology Museum at Mott Community College in Flint, Michigan.

By 1969, faculty member Chester Wilson became the director of the collection and through his efforts the number of displays expanded steadily. This was made possible with a wide variety of support and contributions from many organizations, including the Flint Rock & Gem Club, the Michigan Geology & Gem Craft Society, and the MCC Student Geology Club. Many generous individuals also donated their personal collections and Chester Wilson was among those who contributed many specimens accumulated throughout his 30 year career. The museum was renamed in his honor on September 23, 1991 to the Chester H. Wilson Geology Museum. A few years later in 1995, the Gorman Science Center was gutted for a complete renovation and the museum had to be dismantled and packed away. Chester Wilson retired before the museum could be reassembled.

This is when I was first introduced to the collection. Hired on as a new faculty member teaching geology and physical science, I was offered the opportunity

to restore and update the museum. I spent several years setting up the museum in its new location on the first floor of the Gorman Science Center. I can still remember opening each box and unwrapping each sample, it was like permanent Christmas for several months while I took stock of what we had. At that time, the collection records were "lost" and there was absolutely nothing to help me reconstruct the museum but a few old photographs and the labels on each box like "Minerals of Australia, box 1 of 3". Later, the old card file boxes were found (remember the contents of a three story building had been packed up and when returned took several years to sort through). Knowing the value of provenance for any museum, one of my first priorities was to move the sample records from the old card file system to a more modern computer database. We were able to find a talented individual to customize a database that met our needs and hired a mineral and fossil expert to appraise our specimens.

The mammoth skull and tusks, on display at the Wilson Geology Museum.

Most recently we have been updating the display cabinets with added security features and new lighting. Unfortunately, to make the upgrades to the display cabinets it was necessary to remove all the samples (not again!) which meant closing the museum until the renovation was finished and the displays rebuilt. Taking everything out did give us the opportunity to finish a project started several years ago – photographing and measuring every specimen for the database. Progress over the years has been slow as working on the museum was mostly a labor of love I did when time allowed outside my teaching schedule. Luckily our administration has always been supportive with non-instructional time built into my schedule and the ability to hire on student help. Both of my last two student assistants have been wonderful, tirelessly photographing and using Photoshop to edit picture after picture. I would probably still be photographing the second display cabinet if it wasn't for them!

The collection has also continued to grow over the last 12 years. I remember one notable year after I had just put together a new course entitled "Geology of Dinosaurs" I proposed we should add some dinosaur models and fossils in the museum for our students. That was the year my dean, Johanna Brown, obtained for me a five by seven foot juvenile *Maiasaurus* skeleton cast which now stands sentinel in our entrance lobby. It happened the Vice President of Academic Affairs had just announced there were some funds available for special projects and my dean likes to tell the story of how she asked the Vice President for a dinosaur. Now our students have the unique opportunity to study a scientific grade cast of a dinosaur without a trip to a large museum or university.

We are very proud of our collection and goal of the museum has always been to provide access for our students and the community to view and learn from the wide variety of earth science materials we have on display. We regularly provide tours and educational programs by request and our students taking physical geology and physical science receive the benefit of access to so large a collection. I must commend the administration at Mott Community College for their continued financial support of this facility which requires a steady commitment to reserving the space in our science

building and a willingness to support the long-term maintenance and upkeep of such a project.

I am happy to report we will be reopening the museum in December while we complete the installation of a few remaining displays. I would like to invite anyone traveling by Flint to stop by and see the Chester H. Wilson Geology Museum, a little known gem! Visitors are welcome to email me for a tour at sheila.swyrtek@mcc.edu.

Campus Museums II

The story of the Science Community Center

by Garry Hayes
Modesto Junior College

If any generalizations can be made about the economy of California's Central Valley, it is that conditions are worse here than for most other parts of the country. If there is a slight downtown in the national economy, the valley drops into a recession. If the country drops into a recession, the valley drops into a depression. During the Great Recession of the last few years, unemployment reached 40% in a few valley towns, and lingered around 20% overall. One of the myriad reasons for this is the poor level of education in our population. We have high dropout rates, and low rates of college graduation success.

Our local community college has labored to improve scientific literacy in our valley, but we have always been hampered by our facilities. Science classes are taught in a 1950s-vintage building, and although we have a natural history museum, it has long operated out of a pair of remodeled 1920s houses. The main display area is barely larger than a living room. The museum is popular with local school children, but there is only so much that they are able to do in their small space.

We scarcely hoped that the community would support it, but in 2004, the people of our district voted for Proposition E, a bond issue that provided for more than 300 million dollars for a complete renovation of our Modesto Junior College campus. The centerpiece was to be the *Science Community Center*, which would house the labs and classrooms for chemistry, biology, physics, earth sciences, and astronomy. But even more, it would include a planetarium, an observatory, and a vastly expanded Great Valley Museum. The north side of the building would be an outdoor laboratory with a pond and stream environment and native plants display.

The mock-up in 2010

The reality in 2012

There were huge challenges even though the community supported our efforts. At the time, the housing bubble was at the point of highest 'inflation" and building costs were extreme and rising at around 20% a year, and the college was not ready to deal with that reality. A number of facility plans had to be modified (*i.e.*, radically cut), and the Science Community Center faced the biggest cuts, as it was the single largest project.

Then the Great Recession hit. Unemployment skyrocketed in our area, and for the next three years, our region had the highest foreclosure rates in the nation. It was (and still is) one of the most difficult times in our college's history, as we were forced to lay off tenured faculty, and eliminate entire programs (in a disastrously arbitrary manner).

There was only one silver lining: construction costs plummeted as well. What had been impossible became once again possible. The Science Community Center took shape over the next three years at something very close to our original goal.

The new museum will be expanded to several times its current size (it will take up most of the bottom floor of the building). There will be extensive exhibits highlighting the unique ecosystem of the Great Valley (an ecosystem heavily altered by agricultural development). There will be new exhibits concerning the geology of our region, a fascinating story that includes the accretionary wedge and forearc basin of the subduction zone that produced the granites of Yosemite and the Sierra Nevada. There will be a globe projection system ("Science on a Sphere") that will show plate tectonics in action on a large sphere representing the earth.

The region has a rich paleontological history, and this will be part of the new museum exhibits as well. Students and staff of the division raised the funds to purchase a full scale replica of a saber tooth cat skeleton (our state fossil), and a mosasaur skeleton will hang from the ceiling of the geology area of the building. Specimens of the Pleistocene megafauna will be included in the exhibits.
We could scarcely believe that our economically challenged community would so strongly support the teaching of science, but they did and we will have an incredible facility with which we can reach out to our citizens. Where thousands of children were educated in the past, we will now have the capability of educating tens of thousands. The community will now have access to a state of the art planetarium and observatory. And we will now have a museum that will perhaps pique the interest of the millions of tourists who pass through Modesto on their way to Yosemite or Lake Tahoe. The facility opens this summer. If you pass through, be sure to check it out!

Campus Museums III

Casper's Friendly Science Museums

by Deanna Schaff
Casper College

The Tate Geological Museum, located on the campus of Casper College in Casper, Wyoming, offers a unique family experience that allows visitors to step back in time with their impressive exhibits of fossils and minerals, many of which are specific to the Wyoming area. The Tate Geological Museum also offers opportunities for members of the public to participate in dinosaur digs during the summer months.

Dee the Columbian mammoth fossil is a prominent feature of the Tate Geological Museum.

The museum is the caretaker of what may be the largest mounted Columbian mammoth found in North America. Following the discovery of "Dee" in 2006 the museum spent four years excavating and preparing the mammoth for display. The specimen is approximately 90% complete and has become the main attraction of the museum.

The summer of 2011 brought "Lee Rex" the *T. Rex* to the museum. Lee's skeleton is enclosed in a 8 ½' by 18' concretion which has been moved to a building adjacent to the museum. The preparation of the fossil is being done there and the staff can arrange tours to the "Lee Rex barn" upon request.

Open six days a week, the Tate Geological Museum is free and is open Monday thru Friday 9am to 5pm, and Saturday 10am to 4pm. The museum is a nonprofit organization which depends extensively on donations. It also receives support from Casper College and its gift shop, which offers a large variety of books and souvenirs. Group tours may be arranged. The Tate Geological Museum can be contacted at 307-268-2447. Visit their website at www.caspercollege.edu/tate.

Visitors enjoy a Tate Museum prep lab tour.

The Werner Wildlife Museum, located just a short walk from Casper College's campus, houses a collection of Wyoming's incredibly diverse wildlife, including mammals, birds and fish. The focus of the museum is on species native to Wyoming, but also includes a large collection from Africa and other locations around the world.

Their world class trophy mounts make this collection exceptional. The exhibits serve a broad audience from pre-school aged children to avid anglers and hunters. School children especially enjoy the touch tables where they can feel the difference between furs of different species. The patio area at the back of the museum allows a place to relax and enjoy the wildlife that often visits the back yard.

Admission to the museum is free, so the museum depends extensively on donations. Group tours of the museum may be arranged during its regular hours Monday-Friday from 8:30 a.m. – 5:00 p.m. For more information call the museum at 307-235-2108 or visit its website at www.caspercollege.edu/Werner.

How a geologist became an astronomer, too

Chichanski's scope in good company during a 2012 astronomy trip to Lassen Volcanic National Park in California. Photo by Carl Larson.

by Marek Cichanski
De Anza College

I'm a community college instructor who's been teaching geology for nearly fifteen years, and I'd like to tell you about one of the most positive things I've done for my geology teaching lately – I've learned to teach astronomy! That may sound strange, but getting an astronomy degree and adding it to my teaching duties has done two things for me that might appeal to you, too: It has greatly expanded the `life of the mind' for me, and it's helped me become more valuable to my school during challenging times.

I can't remember a time when I wasn't fascinated by space and astronomy. My interest in the universe beyond the Earth is as old as my earliest memories. As a teenager, however, I grew increasingly interested in mountains and mountaineering, and my early experiences on Mt. Rainier led me to college at the University of Washington. Although I was initially a physics major, I took an introductory geology course during my freshman year. It opened the door to a whole new world of wonder, and to a change of major. I did a mapping-based dissertation in structural geology at USC, and while I loved that research, I found myself wanting a job that revolved around teaching. This led to a position at a large community college in the greater San Francisco Bay area, starting in 1998. Ten years

later, I approached my college's astronomy faculty, to discuss the possibility that I might get a master's degree in astronomy and add that subject to my teaching duties. (Like our geology department, our astronomy department teaches large survey courses that serve mostly non-science majors.) My most practical degree option turned out to be an online program offered by Swinburne University of Technology in Melbourne, Australia, which I started in 2008 and finished at the end of 2011.

That's what I did in order to teach astronomy, but why did I do it? Why would someone who really enjoys teaching introductory geology add astronomy to their job? As I mentioned above, astronomy was in some ways my `first love' from childhood, and during my time teaching geology, I'd become an avid amateur astronomer. After many dozens of nights of visual observing and astro-imaging at various Northern California dark-sky sites, and after two trips to Australia to see the southern-hemisphere sky, I started to feel downright silly about not teaching the subject at my school. Although the prospect of getting a master's degree in my spare time was quite daunting, I found myself powerfully drawn to the simple prospect of learning the subject in depth. When I started teaching geology full-time, I found that even a Ph.D. in the subject doesn't necessarily mean that one has a broad general knowledge of the field, and I'll bet many of you discovered this, too. The first few years of my career, when I absorbed as much general geology as I could, were among the best years of my intellectual life. The prospect of going through something like that again with astronomy, daunting though it might be, was too much for me to resist.

Marek Chichanski and his telescope

One thing that really surprises me is how good it feels to be `tantalizingly torn' between the contemplation of geology and astronomy. Sometimes I'll let my thoughts turn to how much more I want to know about, say, stellar evolution or Big Bang nucleosynthesis, and suddenly part of my mind will say `Wait! You're supposed to be thinking about low-angle normal faults or the breakup of Rodinia!' (or whatever...) However, neither the rocks of the Earth's crust, nor the distant galaxies will feel hurt if we pay more or less attention to them! Adding a new area of focus to my mind's life has led to feeling torn, but in a good way. I've often felt that a big part of teaching introductory science for a living is communicating our personal interest and enthusiasm for our subject(s), and my work in astronomy has only increased how much of that feeling I carry with me into both classrooms.

I got my astronomy degree and started teaching the subject during tough economic times. Although my interest in astronomy was my primary motivation, it's also true that I was expanding the number of jobs I can do at my school. That's not a bad thing to do during times like these, I'd argue.

One of the other great things about indulging one's interest in a new subject is that places and things can take on new layers of meaning. For me, northern California's Lassen Peak is a great example. Many geologists know Lassen as a `natural laboratory' of igneous processes and volcanism. The mafic blebs in the rhyolite of the Chaos Crags, the quartz crystals in the basalt of the Fantastic Lava Beds, the geyser-like hot springs at Bumpass Hell – these things all make Lassen a geological wonderland. But for me, Lassen is also synonymous with astronomy. Each summer, I do astronomy at the trailhead parking lot for Bumpass Hell. It's a marvelous observing site, located at nearly 8500', with an open southern horizon, and far from most sources of light pollution. A good night at Bumpass during the dark of the moon is amazing to behold, and it allows an amateur astronomer to really push the limits of their abilities and equipment. I even did some observing and imaging for a few of my Swinburne projects from this site. For me, `Bumpass' now means astronomy as much as it means geology, and I treasure the place all the more because of it. Developing these new connections to places like the western national

parks has been a very positive side-benefit of adding astronomy to my scientific life.

In the end, although it was a lot of work, getting an astronomy degree and adding those courses to my teaching duties has been well worth it. Although it might seem like I was `taking away' from geology, it has actually added a great deal to my career and my intellectual life. If there's a subject you've always been interested in besides geology, you might want to think about getting qualified to teach it!

2YCs and STEM: Workshop report

by Dave Voorhees
Waubonsee Community College

It was a picture perfect weekend in October to have a perfect workshop at the Science Education Resources Center at Carleton College in Northfield, Minnesota, on "Supporting community college faculty across the STEM disciplines," funded by the National Science Foundation. The workshop brought together 23 educators representing 13 disciplines who addressed the isolation of community college instructors and their lack of engagement with discipline-based professional associations and NSF-funded projects. Each discipline was represented by 2 participants, and these were the geosciences, math, physics, chemistry, biology, engineering, geography, sociology, economics, political science, history, and English. Seventeen of the workshop participants were from community colleges, three from four-year colleges, and three from professional societies. This was the first time such a diverse assemblage of disciplines was brought together to discuss common problems and to discuss common solutions. The workshop was superbly organized and run by Mark Maier, Economics, Glendale Community College (CA), Heather Macdonald, Geology, College of William & Mary (VA), and Katherine Rowell, Sociology, Sinclair Community College (OH).

The overall aim of the project is to improve student learning across STEM disciplines by increasing community college faculty use of existing resources, one of which is an extensive website (see below). During the 2 days of the workshop, there were synergistic activities and discussions covering the broad issues of: identification of discipline-based resources, models and materials for discipline-based professional development on campus, and the relationship of professional societies and isolated community college faculty. Excellent focused discussions were on: integrating research into the 2YC classroom, pedagogical skills workshops, teaching underprepared students, and program assessment in STEM. Working groups discussed 2YC's and undergraduate research, building networks, engaging adjunct faculty, and disciplinary surveys.

To match the broad and synergistic participants, there is a broad and synergistic set of proposed outcomes to this workshop in the various disciplines around the country. They include on-campus events such as workshops on professional society resources, undergraduate research, and skills students need for success. Long-term projects include mentoring new 2YC faculty using a two-year long program of the American Association of Physics Teachers as a model and to enhance 2YC participation in national meetings through implementation of programs such as subsidized attendance, virtual attendance, breakfasts for 2YC, preconference workshops and welcome mats. Other proposed activities address promoting teaching at a 2YC as a career path, promoting the major, webinars featuring 'cutting edge' ideas or events, newsletters and surveys. The most promising ideas specific to the geosciences included webinars on high-profile topics with high-profile speakers, bringing research into 2YC classrooms, and a 2YC oriented 'pre-conference' at national meetings to provide a 'welcome mat' as used by the American Astronomical Society to avoid the perception of segregation from the main meeting. There was also discussion of a national level "geo-summit" every 2 to 4 years that would include all of the geo-associations (i.e., geography, geology, astronomy, meteorology, oceanography, geoscience education, 2YC, and 4YC) to identify any multiplicity of disconnected resources. More resources specific to the geosciences can be found at http://serc.carleton.edu/2yc/geosciences.html
For more information or questions, please contact David Voorhees (dvoorhees@waubonsee.edu), or one of the conveners, who can be reached through the website for the project.

Peer Mentoring & Tutoring

Keeping self-identified Earth Science enthusiasts and star performers engaged and learning by having them work with, help, and inspire current students.

by Katryn Wiese
City College of San Francisco

Earth Sciences Mentoring Program goals:
• Help students be more successful in the class (higher grades and better all-around experience and attitude) while maintaining high standards and expectations
• Help continuing students (majors and enthusiasts) strengthen their understanding of material and build their confidence in themselves and the subject matter so they are more successful after transfer
• Give majors closer relationships to department, faculty, and each other, so they can better network and prepare for future education and careers
• Save instructors time and patience in overcrowded overworked labs.

WHO? Current students with Earth Science expertise, who have received As in CCSF Earth Science classes and who would like to help current students be more successful in our classes

WHAT? Lab Aides and Study Session Leaders (collectively known as "mentors")
In both these roles, the main goal is to have peers who have completed the classes already successfully GUIDE current students to the correct answers, so students can see if they either already know the answer or how to find the answers.

WHAT DOES A LAB AIDE DO?
Lab Aides assist instructors and students in the lab classes -- effectively acting as teaching assistants. Our labs are always overfull of students -- and their job is to connect with the students in the class and assist them with the lab equipment, exercises, and materials. They are guides and motivators. We try to assign at least one lab aide to each of our lab classes. Their commitment would be 2-3 hrs per week, excluding exam weeks.

WHAT IS A STUDY SESSION?
Times when students from a particular class can study together in the main department lab room and thus have access to study session facilitators and tutors and course materials (like maps, rocks, and microscopes). Students use these study sessions to help succeed in the class, by reviewing material, studying for exams and quizzes, and practicing skills. Student who attend study sessions are cautioned to prepare ahead by reading their textbook, reviewing their notes, and identifying the specific areas in which they need help, practice, or review.

S45 Study Session with Study Session Facilitators

WHAT DOES A STUDY SESSION FACILITATOR DO?
Study Session Leaders sign up for 1-2 hrs per week depending on funding. Their hour(s) are listed on the official study session schedule, and they must reliably show up each week at those times, during which they facilitate group work and guide students who show up towards better study skills and better understanding of material. These leaders facilitate students learning from each other and also act as a tutor, as needed. Their duties include:
• Encourage group work among students of the same class
• Tutor on content
• Advise students on best ways to study and deal with course policies
• Act as confidante to students scared to approach instructor
• Guide students through best practices for success in a class

Key Program elements:
• Instructors identify possible candidates and encourage them to apply
• At the end of the semester in each class, the program is advertised to the entire class, and interested students are encouraged to apply.

Rosa Anduaga, Lab Aide, mentors fellow students on an oceanography field trip.

• Some students are paid (funded through ever-decreasing funds received from campus peer-mentoring program) – most are volunteer – note: most paid students don't really care about the $ anyway – they are grateful for the one-on-one with instructors and the boon to their resume/applications/future recommendations
• Guidelines are developed, but mostly there's a lot of one-on-one mentoring between instructors and mentors who then pass that information along to other students
• Mid-semester and end-of-semester pizza parties/pow wows + group field trips (in cooperation with Earth Sciences Club)
• Website and e-mail list support

How do we know we're being successful?
• All students in the program are encouraged to complete end-of-semester evaluations (both for course and for college grant-funded program)
• Walk into study session hall and listen to laughs, see smiles, and watch the interactions!
• Instructor feedback (increased patience; as a whole, fewer angry students grumbling about "how hard the classes are" and more students pleased about the resources we provide them)
• More majors
• All our majors who are part of our program get into the colleges of their choice upon graduation
• Stronger Earth Sciences Club
• Better alumni connections
• Stronger sense of community among our students

Want more details? Visit our website:
www.ccsf.edu/earth
Drill down through Students… Mentoring…

Lastly, consider some student feedback about the program:

From Earth Science Student and Lab Aide, Allison Adams – Oceanography
"The oceanography lab has been a source of inspiration for me in many ways. When I decided to take…[the] oceanography lecture class and lab, just for fun, about eight years ago, I had no idea it would inspire me to pursue a master's degree in marine biology. After taking many math and science classes at City College to prepare myself, I

am now about one year away from entering graduate school!

"Last semester's inspiration in oceanography lab resulted in two exciting projects. The first one was about plankton. I was so thrilled with looking at the little critters under the microscope in plankton lab that I organized a plankton lab at Mission Science Workshop for my son's first grade class. The Earth Sciences Department's amazing and knowledgeable mentors volunteered their time and expertise in this project and provided inspiring guidance to the 6 and 7-year-olds who were thrilled with the alien-looking creatures they saw under the microscope. If you can measure success by how many and how loud the exclamations of 'Awesome!' were from these kids, then this was definitely a success.

"The second project was inspired by last semester's oceanography lab's field trip to Fitzgerald Marine Reserve. It was during this trip that both myself and lab student, Greta Hanley, decided to apply to be a docent at the reserve. We spent eight Saturdays in January, February and March in intense 5-hour training sessions, learning details about every type of creature you might possibly see at the tide pools there. Greta and I have graduated from 'tide pool school' and led school groups on tours of the tide pools. I even had the privilege of being a docent on this semester's lab field trip there in early May!"

From Earth Science Student and Lab Aide, Åse Mitchell – Geography
"I got accepted into UC Berkeley for transfer this fall!! I've decide I'm going to continue on with geography there, as that is my intended major. I enrolled myself into my first introductory physical geography class and lab at City College, and became instantly enthralled within the first few weeks of instruction. I knew then, that this was the subject I wanted to major in. I began to look at the world with a new perspective. I would catch myself watching the ocean, trying to analyze the different processes going on between the rocks and the waves crashing upon them. By the end of the semester my professor offered me a position as a physical geography mentor in the earth science department. I felt honored that my professor asked me to do this, and I am currently in my second semester of mentoring. I was surprised by how much I loved aiding students, especially those who needed help with understanding concepts in geography. The mentoring program enabled me to see the importance of helping others."

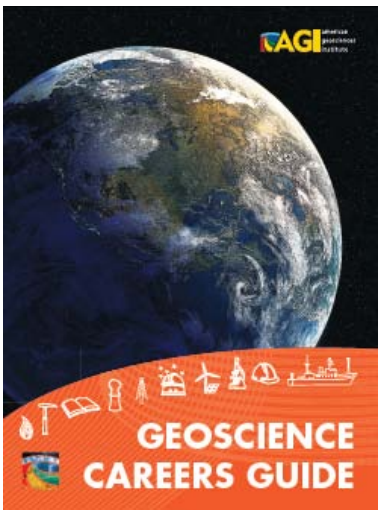
From Earth Science Student and Lab Aide, Andrew Delgreco – Geology
"I am going into my third season as an interpretive park ranger at Mount St Helens National Volcanic Monument (a job I fully credit getting due to my background with CCSF Earth Sciences and being a lab aide!), giving eruptions talks to the public and guided hikes into ancient lava tubes. Opportunities in the CCSF Earth Sciences department jump-started my career, and I am grateful for those opportunities."

AGI's Geoscience Careers Roadshow

Launching the Pilot Study and Moving Forward

by Heather Houlton
American Geosciences Institute

The 2012 fall semester was a particularly busy one. I developed and executed a new program called the Geoscience Careers Roadshow as part of AGI's Workforce Program's efforts to address the workforce talent supply gap in the geosciences. I had the opportunity to travel to six institutions (Northern Virginia Community College, Duke University, North Carolina State University, University of Delaware, Princeton University and University of Pennsylvania) to facilitate discuss-ions about students' perceptions of the geoscience job market and how to "think outside the box." I spoke with over 150 geoscience students who were pursuing Associate's, Bachelor's, Master's and Doctoral degrees in a variety of geoscience disciplines including solid earth sciences, meteorology, GIS, geoscience policy, oceanography and environmental sciences, to name a few.



Heather Houlton

The structure of the Roadshow was different from the traditional PowerPoint lectures. My goal for the program was to host personalized discussions and tailor the presentation to each audience to give students useful information about how to get a job in the geosciences. Since each institution is unique, I started by asking students what their geoscience interests were and then inquired about their vocational interests, hobbies, non-academic interests and what skills were needed to do these things successfully. This set the stage to demonstrate that these seemingly different discussions should all be considered together when approaching one's career. I supported this statement by showing them an infographic that AGI developed, which exhibits a snapshot of the variety of geoscience occupations available, in what sectors they can be found and in what disciplines they intersect.

The infographic was imperative for students to start thinking about the geoscience job market differently. To supplement the infographic, I explained some of the workforce trends we've seen in the past and what we expect to see in the future. The second half of the Roadshow was devoted to giving students practical advice on how to start a career post-graduation. I provided anecdotes from practicing professionals in the field and described examples about successful networking strategies, interviewing techniques and the best ways to follow a lead in the job search. At the conclusion of each presentation, I handed out Geoscience Career Guides that contained materials which complemented and expanded our discussions.

To evaluate the Roadshow, I developed a 10-minute, online survey for students to give feedback, suggestions and comments about the discussions and materials. Surveys indicate that the program is successful and effective in informing students about the plethora of geoscience career opportunities. Students' awareness of geoscience careers increased from before to after the Roadshow and they feel more confident in their ability to pursue a geoscience career. In addition, participating faculty informally indicated that the Roadshow was a unique and compelling approach of promoting geoscience careers to students.

For the spring, AGI is expanding the Roadshow to a national scale by developing an online training tutorial for faculty and industry professionals to conduct the Roadshow in their communities. AGI will supply all the information, the PowerPoint and the Career Guide materials after successful completion of the course. The program's long term success depends on our community's willingness to participate. If you're interested in engaging students as part of the Geoscience Careers Roadshow, please contact me at hrh@agiweb.org.

In November 2012, the Geo2YC team gathered at the Geological Society of America meeting in Charlotte, North Carolina, for its first division meeting.

President's Column

by Lynsey LeMay
Thomas Nelson Community College

Wow! What a year it has been for Geo2YC!

First, I need to thank Dave Voorhees for his wonderful leadership in the inaugural year of Geo2YC. He did a fantastic job!

It was great to see so many of you at GSA in Charlotte a few weeks ago, and I look forward to connecting with you many more of you throughout the coming year. Geo2YC had its first division meeting at GSA this year.

Bob Blodgett presents Dave Voorhees with a plaque commemorating his service as the very first President of the Geo2YC Division.

For those who had to miss it, here is a very quick overview of some things Geo2YC accomplished this year.

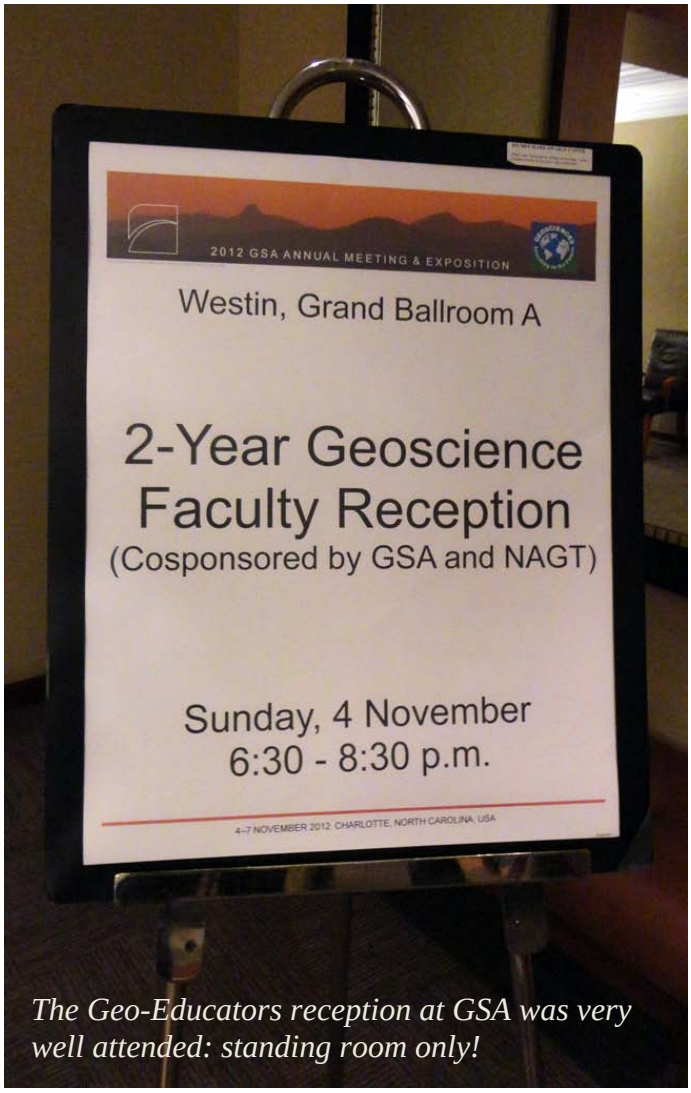
- We currently have 157 members and account for 13% of the entire NAGT membership.
- We have had a presence at many national and sectional meetings throughout 2012 to increase awareness that we exist, but to also learn what we can do to best serve you.
- We sponsored workshops and technical sessions, very well attended ones too, at GSA.
- We responded to an NSF "dear colleague" letter regarding the needs of 2YC faculty.

We have a lot of momentum, and a lot of ongoing projects. Here are some of the things we are working on in the coming year.

- We, particularly Dave Voorhees, is spearheading an effort to help us better find out who we, as the Geo2YC community, are and where we teach. Look for this in the form of a survey coming in January, and spread the word.
- We will continue participation at national and sectional meetings and workshops.
- We are in the development stages of "white papers" to help you with administrative support for field trips and even class offerings, stressing the importance of geosciences.
- We will also be honoring some adjunct faculty through the development of the Outstanding Adjunct Faculty award.

If you have any ideas, or needs that we might be able to assist with, please let us know. Feel free to email me directly at lemayl@tncc.edu.

One final thought - Now is the time of year where motivated students need to start seeking out internships and work experiences for the upcoming summer. One program to share with students is the Department of Energy Community College



The Geo-Educators reception at GSA was very well attended: standing room only!

Internship program. Students spend ten weeks at a DOE laboratory and work on research projects. A former student of mine participated in this two summers ago, and was working with remote sensing data at Oak Ridge National Laboratory. Not only did he learn amazing skills that can be applied across many science disciplines, he also gained valuable research experience, and some security clearances! As a result, he has been offered ongoing research opportunities with his particular lab group. What a great experience, and I encourage you to help students learn about these opportunities.

Please don't hesitate to contact me with any thoughts or ideas!

Hope you have a great end to the semester!

- *Lynsey*

Lessons from the Virtual Front Lines

by Amanda Colosimo
Monroe Community College

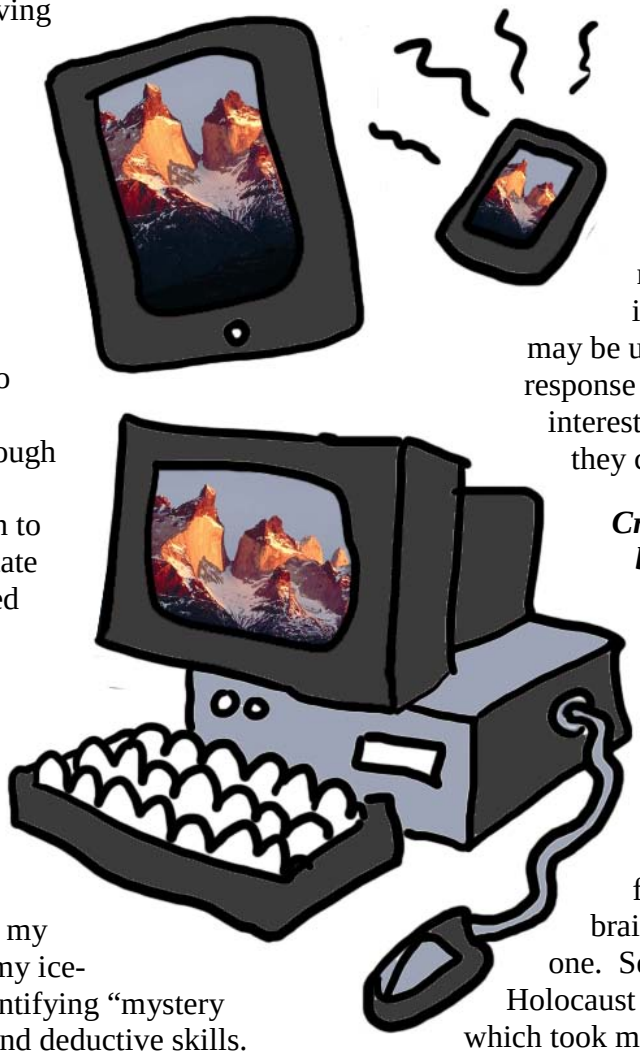
A few years ago, an administrator noted that geology was one of the few disciplines on our campus that did not offer online courses, despite the significant college-wide demand. Our grumblings were probably familiar to you: questions about the ability to assist students efficiently, about the integrity of grades, about the depth of student understanding, but ultimately, we accepted that all of the other natural sciences had found ways around these stumbling blocks. As a concession, I began offering a popular general education course, Great Mysteries of the Earth, in an online format. It is an unconventional course that explores the nature of science and critical thinking, and applies the scientific method to topics as varied as supervolcanic eruptions and the Loch Ness Monster. It is also a course that does not have a lab component, which alleviated a lot of our concerns regarding lab kits and appropriate course materials.

I am now completing my fourth semester teaching Great Mysteries online, the demand for which now exceeds that of my face-to-face courses. This semester I have taught young man deployed for active duty in the Middle East, several students who were called away from home to work on the recovery of the NYC-NJ area after Hurricane Sandy, and a woman who has not left her home in "a long time." At this point, I feel confident that I am effectively facilitating the course and managing student issues, but this confidence has not come without some significant lessons. Here is a short summary of some of the things I wish someone had told me at the outset of this experiment:

It takes time. No, really, a lot of time. I would estimate that the first semester teaching online, I worked more hours than if I had two face-to-face classes. That time was spent preparing assignments and materials, facilitating the class, dealing with technology issues, and grading, which was much more significant than in a face-to-face course. The second semester was not much better, as I was convinced that most of what I did previously needed

substantial improvement. Last semester, I taught two sections, and have now grown to three sections fully online. My edits are more "maintenance" now, but grading is still a significant chunk of time. *Retain what is already working.* This may seem obvious, but most of the engaging activities that you already do in class can be adapted to the online environment.

For some course content, I have used the voice memo application on my iPhone to record brief lectures to supplement PowerPoint slides and introduce activities. I typically allot the same amount of time in the online setting as I do in my traditional classroom when giving quizzes and exams. This ensures that even if students had materials in front of them (and assume that they will), without studying the material prior to the assessment, they will not have enough time to complete the assessment.



Adapting mapping activities to Google Earth activities is relatively straight-forward, though can be challenging for true novices. Next semester, I plan to experiment with Jing to facilitate assignments with more detailed instructions where students routinely struggle.

It is possible to translate your great classroom activities into discussion forums. It may even be improved, since online you "hear" from every student. In my traditional classroom, one of my ice-breaker activities involves identifying "mystery objects" using observational and deductive skills. Virtually, I can divide the class into small online "teams" that are assigned to review YouTube clips of me turning over objects, dropping them to listen to the sounds that they make, abrading friable pieces, etc. They then discuss observations and possible identifications in both small and then large groups.

Time management, an advanced balancing act. In all honesty, time management is still a struggle, although this semester, there were only two weeks where I felt that grading was analogous to shoveling in a blizzard. However, here are some good practices I have accumulated over the years:

- Open two learning modules simultaneously when feasible. This increases students' time flexibility and also varies your grading a bit. Reading 70 case studies on the end-Cretaceous extinction is mind-numbing.
- Grade assignments as soon as possible. This prevents you from facing 100+ assignments to grade at any one time and gives the students timelier feedback.
- Giving thorough feedback early in the semester yields better results later in the semester, especially in discussion forums. This is a new mode of assessment for instructors and students, who may be unaware what a substantive response looks like… or may just be interested in discovering how little they can do to get full credit.

Craft discussion forums to be both informative and engaging. Initially I believed discussion forums held little instructional value, but now use them to identify scientific misconceptions as well as increase student engagement. Last semester, I asked students to come up with a definition for "mass extinction," as well as brainstorm some potential causes of one. Several students thought that the Holocaust was an appropriate example, which took me by surprise, because not one single species went extinct in that event. In another discussion forum, students calculated their carbon footprint and identified potential possible changes to their lifestyles. This resulted in one of my students sharing her recipe for homemade soap and an in-depth discussion about the benefits of composting.

Above all, clarity. In my first semester teaching online, I sought out assistance from our faculty support team. A dishearteningly low percentage of students were completing their assignments (This is not unusual, it turns out. Online courses typically have an attrition rate 10-20% higher than face-to-face classes, which may lead one to question whether they are truly serving students best) and despite my best efforts to engage with students "early and often," I felt like I was failing. My instructional liaison identified several ways to re-organize the way I presented assignments that made it clear to both the careful and careless reader what was expected and when it was expected. Now not only does each module have an overview page that lists assignments and due dates, but each assignment link individually has its due date as a subtitle.

In the last few semesters, I have been fortunate to teach face-to-face classes only four days a week, so I found it useful to (minimally) have a weekly announcement listing what assignments had been graded and what assignments were due that weekend.

In spite of what I have learned, my own reservations about online learning persist. I question whether it greatly enhances awareness of geology as a discipline or a career. I find that for many students, maintaining motivation without a strong online sense of community can be challenging. However, for many of our general education students, who are the majority of our students, they offer an opportunity to increase scientific literacy while serving the needs a diverse student body. At the end of the day, if instead of teaching an army of geologists, I have taught an army of scientifically literate people, I think I can still consider it a success.

Nominate an outstanding adjunct faculty member for recognition with the Geo2YC Division's new **Outstanding Adjunct Faculty award.** Nominate them here: http://nagt.org/nagt/divisions/2yc/oafa.html

FOUNDATIONS is edited by Callan Bentley, Northern Virginia Community College. Please get in touch with your feedback: cbentley@nvcc.edu