NAGT Geo2YC Division

FOUNDATIONS

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Earth Educators' Rendezvous Workshop: Teaching with InTeGrate Materials in a 2YC Environment

by Elizabeth Nagy-Shadman
Pasadena City College, Pasadena, CA

Eighteen 2YC adjunct and fulltime geoscience and physics faculty participated in a workshop spanning two mornings at the Earth Educators' Rendezvous in Boulder, Colorado, in July 2015. A major workshop goal was to facilitate the incorporation of InTeGrate modules into introductory courses taught by two-year college faculty and instructors. The InTeGrate module materials are designed to address the program's goal of increasing geoscience literacy for all undergraduate students. It was exciting to learn the first morning that participants intend to use InTeGrate materials in a host of different courses (physical geology, oceanography, environmental sciences, earth sciences, meteorology, science in society, environmental geology, physics, and science for pre-service teachers), a testament to the adaptability of these free, online instructional resources.

Three 45-minute presentations of InTeGrate modules, as well as frequent group discussions, helped participants discover some of the finer details within the materials and provided hands-on experience using the lessons. Lisa Gilbert from Williams College in Connecticut gave the first presentation of the InTeGrate module she co-authored *Natural Hazards and Risks: Hurricanes.* Workshop participants completed an exercise in which they had to explain the risks of a container ship staying in port versus heading to its destination given an approaching hurricane in the region.

Martha Murphy from Santa Rosa Junior College in California gave an overview of the InTeGerate module she co-authored *A Growing Concern: Sustaining Soil Resources through Local Decision Making*. Participants uploaded an app called SoilWeb™ onto their computers or cell phones and used it to find a wealth of information about the soil in any location, including soil taxonomy, land classification, hydraulic and erosion ratings, geomorphology, and more. This tool is used in an assignment in which students identify and sketch soil horizons beneath them, explain how a chemical property of soil (percent soil organic matter) is distributed with depth, and compare local erosion rates, soil horizons, and percent soil organic matter with other sites and estimate differences in sustainability.

Lisa Gilbert from Williams College (left), who presented parts of her InTeGrate module "Natural Hazards and Risks: Hurricanes" during the workshop, talks with Sarah Sherman from the University of British Columbia.

Although I am not a module author I have used the *Climate of Change: Interactions and Feedbacks between Water, Air, and Ice* module for several semesters in my oceanography courses at Pasadena City College in California. I gave the third presentation that included a hands-on activity working with temporal and spatial variations in albedo of the Greenland ice sheet. This involved working with real data and culminated in a jigsaw activity.

Participants worked in groups of three to analyze albedo data from Greenland, part of the InTeGrate module "Climate of Change: Interactions and Feedbacks between Water, Air, and Ice".

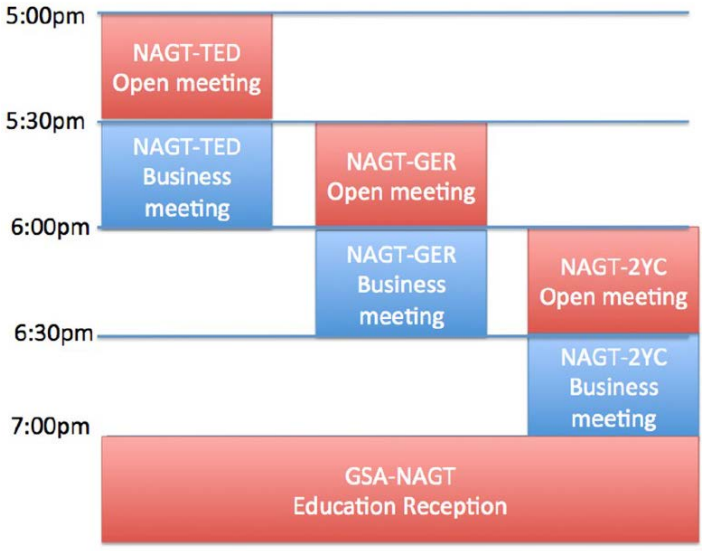
My co-convener Dave Douglass (Dean of School of Science and Mathematics at Pasadena City College) and I, as well as most of the participants, agreed that a third workshop day would have been helpful to dig into syllabi revisions, for which we simply did not have time. Some concerns related to using the InTeGrate materials that emerged from discussions included clear alignment of module materials with NGSS, ensuring that all materials are ADA compliant, a need for a module that covers "deep time", how to add local/regional examples to the lessons, and to have technology platform independence (i.e., phones, tablets, etc.).

The module web pages are designed in a standard format which helps instructors navigate and select the activities that will fit best in their courses. One of the particularly nice features is that instructors do not need to use an entire module in their classroom, which typically would cover six units (50-mintue class periods), but can select individual units in any order to fit into their current syllabi. For more information got to http://serc.carleton.edu/integrate/index.html.

President's Column

by Ben Wolfe
Kansas University Edwards Campus, Overland Park, KS

Cool nights and the turning of leaves indicates autumn has officially arrived and thus closes another successful year for the Geo2YC division. Sadly, this is my last column as President of the Geo2YC division. It has been a great honor to serve the division in this leadership role and I am excited for the continued excellence in store for our division under the direction of our next President Kaatje Kraft. I am also happy to announce the incoming Vice-President for the division will be Brett Dooley from Patrick Henry Community College, Martinsville, Virginia! Please join me in welcoming her as the newest division officer! Both Kaatje and Brett will be installed in their respective new roles at our annual division business meeting Sunday November 1st during the GSA Annual meeting. Since there is quite a bit of cross pollination of membership between the three divisions within NAGT and all our business meetings have historically occurred at the exact same time, we have staggered the times of the actual division business meetings. The open meeting times will provide an opportunity to socialize and network with fellow division members with the actual business meeting immediately following. The meeting location will be announced in the GSA Annual Meeting program. The staggered meeting times will be as follows:



Speaking of the GSA Annual meeting, once again there are a plethora of excellent sessions to choose from. Our division is sponsoring two of them:

- T70. Digital Technology in Real and Virtual Geoscience Experiences
- T87. Supporting Geoscience Student Transfer: Collaborations, Partnerships, and Practices for Success

Others that may be of special interest to 2YC faculty:

- T25. An Early Involvement of Undergraduates and K–12 Students in Geological Research Brings a Strong Sense of Ownership and Achievement for Young Researchers (Posters)
- T58. Undergraduate Research Talks: The Next Step in Student Research Projects
- T66. Beginning a New Era in Earth Science Education: The Role of Geoscience in Implementing the Next Generation Science Standards
- T69. Closing the Diversity Gap in Geoscience: Successful Models, Best Practices, Benefits, Outcomes, and Next Steps
- T79. Geoscience Career Planning in the Classroom and Beyond
- T81. Intentional Integration of Research into the Curriculum: Undergraduate Research as a Teaching Practice (Posters)
- T85. Preparing Pathways in K–12 Classrooms for Tomorrow's Diverse Geoscience Workforce: Teachers, Students, and Communities
- T89. Trans-Disciplinary Pedagogical Strategies—Enhancing STEM Instruction through Real-Time Problem Solving Facilitated by Interdisciplinary, Project-Based Learning
- T90. Undergraduate Geoscience Education and Research Opportunities Supported by NSF Funding Programs
- T91. Using Place-Based and/or Data Driven Approaches in Geoscience Undergraduate Teaching and Research (Posters)

It should be a great annual meeting and I look forward to seeing many of you in Baltimore!

The annual report for our division has been completed and was presented to the NAGT Council on September 22, 2015. A full copy of the report can be found at http://nagt.org/nagt/about/workspaces/council/2015_annual_rep.html. I am pleased to announce that we continue to grow in membership as a division with a current total of 258 members this year. There is still plenty of room for continued growth and I ask members to continue to serve as ambassadors to fellow geoscience colleagues sharing the awesome benefits of joining our Geo2YC community – particularly for those 2YC faculty in single person departments, rural schools, or most importantly those interested in being a part of an active, supportive, and engaging 2YC geoscience community. Also remember that membership to our division is not just limited to 2YC faculty. We encourage any individual interested in 2YC issues, students, advocacy, and support to be a part of our community! How much better for growth in awareness of our community than through the help of our 4YC and K-12 partners!

Recently, our Secretary/Treasurer, Christine Witkowski stepped down for the division. Please join me in thanking Christine for her excellent service this past year! As a result, the Secretary/Treasurer position is currently vacant. Our previous treasurer Allison Beauregard Schwartz, University of West Florida, has graciously agreed to fill in as main contact overseeing the Geo2YC finances and account but we are still without a secretary. The Geo2YC officers are currently exploring options for an interim replacement with the intent of posting a call for the full position at the time of our next election cycle in the spring. If you or someone you know may be interested in serving in an interim capacity as secretary/treasurer, please contact me (ben.wolfe@ku.edu).

Thank you again to the division for the wonderful opportunity to serve as President and a special thank you to the great Officer team – the division is blessed to have a fantastic group of leaders at the helm. As for my future, I don't plan to stay idle too long so watch out members in the Midcontinent section – it's time to revitalize the section and reengage the geoscience education community in the Heartland!

-Ben Wolfe

Congratulations to Robert Rohrbaugh, Outstanding Adjunct Faculty Quarterly Honoree!

by Karen M. Layou
Reynolds Community College
Richmond, VA

The OAFA Committee is delighted to recognize Robert Rohrbaugh of El Paso Community College (EPCC) as the September 2015 Quarterly Honoree. Robert was nominated by Joshua Villalobos, Associate Professor of Geological Sciences at EPCC.

Joshua states, "Whenever I hear the phrase "outstanding adjunct" my mind immediately thinks of one individual: Rob Rohrbaugh. His work and passion has not only made the geology department at EPCC a more effective teaching environment, but more importantly, has opened new doors for our students in geoscience education. Rob has been teaching at EPCC for over 8 years as an enthusiastic adjunct whose passion and energy for geology exceeds that of most geologists I know. Rob started his path in geoscience education as a High School Dual Credit (DC) Geology Instructor for the El Paso Independent School District. As a DC instructor, Rob was able to channel his passion, knowledge, and experiences in geology to his high school students who took his class for college level credit. Rob always went above and beyond the average college curriculum for his high school students, illustrating to them what a geoscientist truly does in the field. His pedagogy and extra-curricular activities showed his students the true value of a geology education and how their age, race, and backgrounds were not limiting factors in their success in his class, or in understanding geology.


Robert Rohrbach discussing metaconglomerates in the field

Soon after starting his position as a DC instructor, Rob began teaching at EPCC with the same remarkable results. Rob's enthusiasm and passion made him one of the most popular adjuncts, and he was responsible for converting several students to declare Geology as their major at EPCC. However, his passion for geo-education does not end in the classroom. On his own, Rob created a program called GEO-Ventures El Paso in 2012 (https://www.facebook.com/GeoVenturesElPaso/). This program is geared to get EPCC students, and members of our local community, to participate in educational geology hikes, tours, and multi-day camping trips in our region. All of his GEO-Ventures El Paso activities include curriculum that he develops on his own and are tied to ongoing learning goals and objectives in our geology department at EPCC. It is difficult to sum up the work and effects of these efforts Rob has provided for us at EPCC and to our students in just two paragraphs. But then again, knowing Rob he would say that this recommendation is already two paragraphs too long!"

Congratulations to Rob from the Geo2YC executive council! We are pleased to award Rob with an honorary membership to the Geo2YC Division of NAGT for 2016 and he will be in the pool for consideration for the annual award announced at GSA 2016.

Please consider nominating your adjunct colleagues to recognize their role in engaging your students and community in geosciences! Complete the nomination form at: http://nagt.org/nagt/divisions/2yc/oafa_nomination.html.

In the May issue of FOUNDATIONS we put out a call to see if you were using mobile phone apps in your classrooms. This is the first in what we hope to be an ongoing series of letters from you highlighting the opportunities created by these technologies

Please submit your letters to the editor: twhittak@unm.edu

App: SoilWeb™

By:
Martha Murphy
Santa Rosa Junior College, Santa Rosa, CA
Hannah Scherer
Virginia Tech, Blacksburg, VA
Sarah Fortner
Wittenberg University, Springfield, OH

The SoilWeb™ online soil survey can be used to access USDA-NCSS (National Cooperative Soil Survey) detailed soil survey data for most of the United States. SoilWeb™ pulls detailed soil survey data from both the 1:24,000 Soil Survey Geographic database (SSURGO) and the 1:250,000 scale State Soil Geographic database (STATSGO). There are both IPhone and Android SoilWeb™ apps for smartphones for the general SoilWeb™ app, as well as additional online apps, including SoilWeb Earth, which uses Google Earth and allows you to view mapped soil areas in 3D. These online applications can be found at: http://casoilresource.lawr.ucdavis.edu/gmap/. Instructors should test the smartphone app before use, as some locations are not tied to soil profiles. If the smartphone app does not work, the web version allows for site selection.

"Students enjoyed learning how to use the app in the classroom and some commented that they were excited to use it to learn about the soil was at their homes. It was also great to use on our field trip to the university research farm because students could compare what they were seeing in the field to what was published on SoilWeb™" – HS

In the InTeGrate learning module *A Growing Concern: Sustaining Soil Resources through Local Decision Making*, published on the Science Education Resource Center's (SERC's) website, students use SoilWeb™ to investigate soil horizons and percent soil organic matter profiles in the soil beneath them. The use of the app allows students to view real-world data and relate it to their local area. Students can then reflect in the exercise on how their newly gained soil knowledge relates to food and fiber sustainability. This activity is part of Unit 4 of a 6-unit learning module of stand-alone, 50-minute units that use learning-centered strategies to help students develop a working knowledge of soil physical properties and geospatial data at both local and global scales. The module culminates with a project centered on making sustainable soil management decisions under global climate change.

"I had one of my students actually use SoilWeb™ in her summative assessment agricultural "fact sheet" that she did for the module. She detailed in her fact sheet the layers of our local soil in making recommendations to local farmers for sustainable soil management" – MM

The module can be found at:
http://serc.carleton.edu/integrate/teaching_materials/sustain_agriculture/index.html.

Congratulations Callan Bentley!

by Tom Whittaker
University of New Mexico Valencia Campus,
Los Lunas, NM

On behalf of the NAGT Geo2YC officers a huge congratulations to Callan on receiving the State Council of Higher Education for Virginia Outstanding Faculty Award. http://www.schev.edu/adminfaculty/OFA/2015/Bentley.asp Among Callan's many accomplishments we are grateful for his work in conceiving the FOUNDATIONS newsletter and serving on the Geo2YC executive committee from 2011-2014 as the newsletter's inaugural editor.

Virtual Poster Showcase, AGU 2015

Pranoti Asher , Ph.D.
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A new and exciting opportunity for your two-year college students to showcase their work is now available through the American Geophysical Union (AGU). Although many students conduct research with faculty in organized summer programs or as part of their course work or their degree work, they often face barriers to traveling to present that research, especially at regional or national conferences. The virtual poster showcase will allow participation by those students who can't travel. The AGU is piloting three opportunities for an undergraduate and graduate virtual poster showcase in the fall of 2015. Contact Pranoti Asher (AGU Education and Public Outreach Manager) for more information.

Service Learning in a Geoscience Course

by Kaatje Kraft
Whatcom Community College, Bellingham, WA

During the fall quarter at my new institution (Whatcom Community College), our service learning director approached me with an opportunity to work with a local organic farm, Growing Veteran's. Their mission is, "to empower military veterans to grow food, communities and each other." (http://growingveterans.org/overview) As a new faculty member, I didn't know much about the organization, but saw an opportunity to integrate undergraduate research with a service component into my course, so I jumped at the opportunity.

After meeting with the growing veteran's staff in the fall quarter, we made a game plan for how my students could best serve their needs and still support student learning from an introductory level.

During the winter quarter, students prepared for collecting data on the farm by practicing writing research questions and hypotheses and proceeded to collect data on campus using pH and conductivity meters. In addition, one of the veteran's came and presented his own research for his master's on organic farms in WA to students to help them understand the scope of a larger research project. Students had a tour of the farm to better understand the landscape, and then returned to collect their data on a separate day. We invited the veterans to attend the student presentations on their findings. Student research questions included looking at pH and conductivity of the soil and the groundwater, soil density and infiltration rates of the topsoil all in an effort to determine the health of the soil for their farming practices. As one student claimed, "some benefits of my experience was that my knowledge of groundwater and soil composition was greatly enhanced by being out in the Growing Veterans field, digging down to the water table, and that I was able to give Growing Veterans a comprehensive look at the quality of their groundwater." By having the hands on experience based on their own research questions, they were able to apply concepts from class directly into the field, and see the benefit of their research through the reception from the veterans. "The main benefits I got from my service learning experience was

presenting my results that I had gotten from the farm and showed it to the growing veterans."

The veterans appreciated receiving data about their farm and the students learned more about content for the course in a real world situation. In a post-course survey, students were asked to identify the main benefits from this project. More than 50% of the students indicated that the project helped them learn some aspect of course content or skills upon completion of this project. In addition, the rest of the comments focused on affective factors like building community and developing new friends, all of which are critical for student persistence.

I'm looking forward to continue this project in the future in hopes we can work to develop long term understanding of the farming practices in addition to continuing to support student learning. One strategy for successful future implementation was by taking the time to make reflective notes throughout the experience, as I'm already thinking about what I'll improve for next time. For example, I may make the field collection day a whole day (students provided consistent feedback that they would have liked to have had more time collecting data) rather than trying to squeeze it into classtime. In addition, I'm considering having students do a poster session instead of a series of presentations, so that they would then have the option of presenting their research at AGU's virtual poster session (http://education.agu.org/undergraduate-students/virtual-poster-showcase/). All in all, a rewarding experience for the students and for me as the instructor.

Letter from the Editor

by Tom Whittaker
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Dear Colleagues,

Thank you for all of your submissions for this newsletter. I am more disappointed than ever that I missed what turned out to be a fantastic first Earth Educator's Rendezvous, but am now über excited for next year's event in Madison, Wisconsin:
http://serc.carleton.edu/earth_rendezvous/index.html

Fall is of course meeting season. We hope you are able to participate in some of the amazing sessions, workshops, and fieldtrips scheduled at GSA and AGU. If you can we'd love to see you at the NAGT open meetings and reception at GSA.

Last but not least, a reminder that we put out a call in the May issue of FOUNDATIONS for your best geology photos using the NAGT Geo2YC pencil as scale. Send your picture plus GPS coordinates to Ben Wolfe (ben.wolfe@ku.edu) and we will feature it in an forthcoming column in this newsletter. Don't have a pencil? Just send an email to Ben and she will send one out to you.

If you have questions or comments about the content of FOUNDATIONS, or have suggestions for future newsletter items please contact me at twhittak@unm.edu.

Thank you!