

THE GER EXCHANGE

“Promoting high quality scholarly research in geoscience education.”

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Making Waves

This has been a productive first year for the new NAGT Geoscience Education Research (NAGT-GER) division! In case you missed the February issue of JGE, check out the featured commentary entitled, “Creating a Community of Practice Around Geoscience Education Research: NAGT-GER.” It’s just one of our division’s efforts this academic year to provide a forum for the exchange of ideas and concerns related to geoscience education. What do you think? Share your thoughts with us and the community!

Additionally, the GER Division leadership is chairing a session on GER at the 2015 GSA

meeting in Baltimore, MD. The session is: *T83. Methods for Conducting Research about Teaching and Learning in the Geosciences*. The goal of this session is to showcase classic and novel methods currently being applied to answer GER questions. Please consider submitting an abstract. The deadline is August 11, 2015.

Finally, we hope to see you at the first annual Earth Educators’ Rendezvous July 13-17 in Boulder, Colorado. There are many great themes shaping up, including several on geoscience education research. Be sure to take a look at the [program](#) and [register soon](#) if you haven’t already. GER-related workshops include: Synthesizing GER: Where are we? What is the path forward?; Education Research Methods—How to; Grant Writing 101; and Getting your Education Work Published. There will also be two oral and one poster session specifically dedicated to GER.

As you read through this newsletter and head into your summer, we hope you’ll thoughtfully consider the many opportunities presented to get involved with the Division, fund and present your own geoscience education research efforts.

Sincerely,
Laura Lukes, President
Katherine Ryker, Secretary

Nicole LaDue, Vice President
Kim Cheek, Treasurer

Long-Range Planning Committee Update

The Long-Range Planning Committee met on March 10th and had their first discussion of what the division should prioritize in the coming year. Following a brief overview of the member survey results from the Fall 2014 survey, the committee discussed the top-ranked activities mentioned in the survey. One priority is the need for professional development on topics such as research methods and preparing manuscripts for publication. The committee agreed to re-open this discussion following the Earth Educators Rendezvous that will be held in July, 2015 since there will be many opportunities for targeted professional development at that meeting. The committee members suggested that we link online resources produced at the Rendezvous to the Division webpage to provide greater awareness these resources among our membership.

The Long-Range Planning committee briefly discussed a few additional topics.

- The need for a structure within which members could create Professional Learning Communities (PLCs) to find critical friends for exploring research topics
- The expanded indexing of the Journal of Geoscience Education and the possibility of indexing JGE in the databases members have found useful for their research
- The importance of raising the profile of GER by connecting with other DBER groups and geoscience education researchers working within colleges of education, as well as having a greater presence at meetings like AERA (American Educational Research Association) and NARST (National Association for Research in Science Teaching)

Our next meeting will be in September. Stay tuned and join us for that meeting. Contact Nicole LaDue (nladue@niu.edu), if you're interested in being part of this committee.

Opportunities to Get Involved with the Division

The Nominations and Elections Committee of the GER division is seeking nominations for the offices of Treasurer, Secretary, and Vice President. Self-nominations are welcomed. All nominations should be sent directly to President Laura Lukes at: llukes@gmu.edu. Nominations should include a brief statement of interest and their current CV, and be received no later than 5:00pm Eastern Time Friday June 5th, 2015.

Additionally, the NAGT-GER is seeking members and chairs for the following committees. If you are interested in learning more, please contact the listed officer.

- **Communications Committee:** Help us spread the word about the GER division and geoscience education research to our members and external groups and individuals. We need people who will create or oversee a variety of ways to share our message, like a Division website, listserv, e-newsletter, presence on social media, etc. Looking to build your resume and get involved? In addition to committee members, we are also seeking a Director of Communications to lead the Communications Committee. For more information, contact Secretary Katherine Ryker (kryker@emich.edu).
- **Long-Range Planning Committee:** Are you interested in helping to shape the long-range vision of the Division and its mission? If so, the Long-Range Planning Committee needs you! This committee shall identify and develop resources to achieve the Division's mission, including identifying and soliciting potential sustaining members. The GER Vice President is the Chair of this committee, so please contact Nicole LaDue (nladue@niu.edu) to help shape the future of the GER Division!
- **Conference Committee:** We need people who are willing to organize collaborative activities at conferences and meetings like those of GSA, AGU, NAGT, NARST, or their sections. This committee will work with the NAGT leadership to coordinate activities like endorsing sessions. For more information, contact President Laura Lukes (llukes@gmu.edu)

GER Researcher Spotlight: Dr. Glenn Dolphin



Name: Glenn Dolphin

Email: glenn.dolphin@ucalgary.ca

Institution: University of Calgary

Department: Geoscience

Title: Tamaratt Teaching Professor in Geoscience

Most recent publications:

Dolphin, G., & Dodick, J. (2014). **Teaching controversies in earth science: The role of history and philosophy of science.** In M. M. Matthews (Ed.), *International handbook of research in history, philosophy and science teaching* (Vol. 1). Dordrecht: Springer.

Dolphin, G., & Tillotson, J. (2015). **“Uncentering” teacher beliefs: The expressed epistemologies of secondary science teachers and how they relate to teacher practice.** *International Journal of Environmental and Science Education*, 10(1), 21-38.

I have an awesome job! Formally trained as a geologist, I have worked in the groundwater industry, taught Earth Science to ninth grade students in New York, received a PhD in science education and began my position in Calgary as the Tamaratt Teaching Professor in Geoscience. My responsibilities include teaching geology courses, doing geoscience education research and faculty professional development.

One piece of my research focuses on conceptual development through embodied experiences - especially how experiences get translated through the use of metaphors, and how some metaphors can actually hinder the learning process. I utilize qualitative methodologies in my inquiries, including collecting audio recordings of student conversations and copies of student work. I use different theoretical frameworks (including experientialism, model-based learning, positioning theory) as lenses to discern patterns in the data. Through abductive and inductive reasoning, I develop explanatory models for the data. For instance, data collected during inquiry activities

focused on other crustal dynamics demonstrated that the metaphor tectonic “plate” inhibited student conceptual development concerning elastic rebound theory and the nature of crustal deformation. From their descriptions and hand gestures, students understood the crust as separate “plates”, brittle in nature (like their dinner plates at home) as opposed to viewing the crust as a large solid, with narrow zones of deformation. This especially interfered with them understanding the build-up and release of elastic energy in an earthquake. They had no experience of elastic behavior with brittle rocks or plates.

Science is replete with metaphors. When we teach, as experts, we are (mostly) aware of the limitations of these metaphors. Students, who are novices, use their everyday experiences by default. These “common” understandings are usually inconsistent with scientific knowledge and can actually work against students developing coherent understandings.

I find qualitative research to be my preferred mode of inquiry for a number of reasons. First, its methodology – going to the field (a classroom, say), collecting data (signs) of phenomena, discerning patterns in the data, developing explanatory models – is very much like the methodology invoked in geology, itself. So, I feel quite at home with it. Second, investigations into conceptual development in the geosciences is relatively new compared to the other science disciplines. Much exploration still needs to be done, which means asking questions like, “what is happening, here?” This is very much suited to qualitative methodologies. And third, though it is usually difficult to generalize results of qualitative inquiries to the population at large (due to typically small sample sizes), it is still a powerful way to understand the individual, social and contingent nature of learning.

Researcher Spotlight Nominations

The GER Division is looking to highlight a different re- searcher in each of its newsletters. Know someone who deserves to be in the GER Spotlight? Want to be fea- tured yourself? Have you or your nominee fill out the form here: [NAGT GER Newsletter Template](#). Completed forms may be sent directly to Katherine Ryker (kryker@emich.edu).

GER Connect

Have an opportunity you'd like to share with the GER community? E-mail Secretary Katherine Ryker (kryker@emich.edu) to get your information featured here.

- The first annual **Earth Educators' Rendezvous** is being held July 13-17, 2015 at the University of Colorado, Boulder. The Rendezvous is an opportunity to "capitalize on the experience of your colleagues at a variety of workshops, present and discuss your own findings, and network with others engaged in improving undergraduate Earth education". To learn more, [check out the Rendezvous website](#).
- **GEOSPHERE**, an online journal published by the Geological Society of America (ISI impact: 2.7) has an open call for papers to the theme: **Human Dimensions in the Geosciences**. The editors have already processed the first paper, and hope to receive many more! The Human Dimensions in Geoscience theme is intended to bring together research that sits at the boundary between geoscience, broadly construed, and social science. Political science, education, history, philosophy, communication, information science, diversity studies, and similar fields can help illuminate some of the most vexing issues facing the geosciences. This special issue will provide a venue for researchers investigating human dimensions in geoscience to share research findings with each other and the broader geoscience community. Submissions are processed as they arrive, and will be published as soon as they are ready. To submit a paper for this issue, go to www.editorialmanager.com/geosphere/ and be sure to note in your cover letter that this submission is for the "Human Dimensions in Geoscience" themed issue. This special issue will remain open for two years and submissions will be accepted on a rolling basis.
- The GER Division leadership is chairing a session on GER at the 2015 GSA meeting in Baltimore, MD. The session is: **T83. Methods for Conducting Research about Teaching and Learning in the Geosciences**. The goal of this session is to showcase classic and novel methods currently being applied to answer GER questions. Please consider [submitting an abstract online here](#). The deadline is August 11, 2015.
- The [Geoscience Teachers in Parks \(GTIP\) Program](#), a "collaborative effort between NAGT and the National Park Service to provide professional development for K-12 teachers of geoscience", is looking for someone to help with their program evaluation. Interested, or know someone who might be? Contact Scott Beason, Park Geologist at Mount Rainier National Park (Scott_Beason@nps.gov).
- Be a part of the ongoing conversation regarding GER! The Geocognition

and Geoscience Education Research listserv is a gathering place for news and events, and a place to ask questions about geocognition and geoscience education research. As of April 2015, the list hosts 283 members. [Go here for more information or to sign up.](#)

- The **Association for Women Geoscientists** encourages you to consider becoming a member today. AWG is an international organization devoted to enhancing the quality and level of participation of women in geosciences and to introduce girls and young women to geoscience careers. Membership is open to anyone who supports AWG's goals. Our members include professional women and men from industry, government, museums, academia, and K-12 teachers, students, retirees, and others interested in supporting our goals.

On-going programs such as the Chrysalis Scholarships and Geoscientists in the Parks continue to support women in early career stages with financial assistance, career Enhancement and professional development. Our awards at the International Science and Engineering Fairs across the country Encourage high school students interested in geosciences, and various Chapter-sponsored outreach and scholarships help K-12 and undergraduate students. AWG's Outstanding Educators and Distinguished Lecturers never fail to amaze, inspire and Encourage other women in the geosciences. AWG is, of course, always looking for people to develop and coordinate new projects and future field trips. There is plenty to do. Please join online [here](#) now. If you have any questions about the benefits of membership, would like to upgrade, or are interested in sponsoring specific programs, contact us at office@awg.org.

- Learn more about the evolution of the Caribbean Island Arc August 9-15 on the **2015 AWG Field Trip to Puerto Rico!** The trip includes a trip to El Yunque National Rain Forest Park, incredible caves and



karst geomorphology, and a visit to the amazing Bioluminescence Bay at night. The member price will be \$1200. Please e-mail Marcia Knadle at MarciaAWG@aol.com or visit www.awg.org for more information.

Puerto Rico photos by Diane Silver

- **Ready to renew your NAGT (and division) membership, or need to update your information?** [Head over to the NAGT website for more.](#)

Funding Opportunities

The NAGT-GER has identified several funding opportunities which may be of interest to its members. If you know of additional opportunities that should be shared with the GER community, e-mail kryker@emich.edu to get your information featured here.

Improving Undergraduate STEM Education: Pathways into Geoscience (IUSE: GEOPATHS) Solicitation 15-526

"The IUSE: GEOPATHS solicitation features two funding Tracks: (1) Engaging students in the geosciences through extra-curricular experiences and training activities (GEOPATHS-EXTRA), and (2) Improving pathways into the geosciences through institutional collaborations and transfer (GEOPATHS-IMPACT)."

[Find out more here.](#) Letter of Intent (required) due 1/5/2015 or 8/14/2015; Full Proposal due 3/16/2015 or 10/5/2015.

Research Traineeship (NRT) Program Solicitation 15-542

"This solicitation extends and broadens the scope of the NSF Research Traineeship (NRT) program launched in 2014. Proposals are invited in two tracks: the Traineeship Track (maximum 5 years, \$3.0 million), dedicated to the education of STEM graduate students through an innovative, evidence-based traineeship approach in high-priority interdisciplinary research areas; and the Innovations in Graduate Education (IGE) Track (2–3 years, up to \$300,000–\$500,000) dedicated solely to piloting, testing, and evaluating bold, new graduate-education approaches, models, and activities and to generate the knowledge required for their customization, implementation, and scaling."

[Find out more here.](#) A letter of intent is recommended for both tracks; Full Proposal due 2/22/2016.

Developmental and Learning Sciences (DLS) PD 08-1698

"DLS supports fundamental research that increases our understanding of cognitive, linguistic, social, cultural, and biological processes related to children's and adolescents' development and learning. Research supported by this program will add to our basic knowledge of how people learn and the underlying developmental processes that support learning, social functioning, and productive lives as members of society."

[Find out more here.](#) Full proposal due 7/15/2015

Membership renewal

Ready to renew your NAGT (and division) membership, or need to update your information? [Head over to the NAGT website for more.](#)



NAGT-GER

Contact Information for Division Officers

President Laura Lukes: llukes@gmu.edu
 Vice President Nicole LaDue: nladue@niu.edu
 Secretary Katherine Ryker: kryker@emich.edu
 Treasurer Kim Cheek: k.cheek@unf.edu