Bulletin
of the Eastern Section of the National Association of Geoscience Teachers

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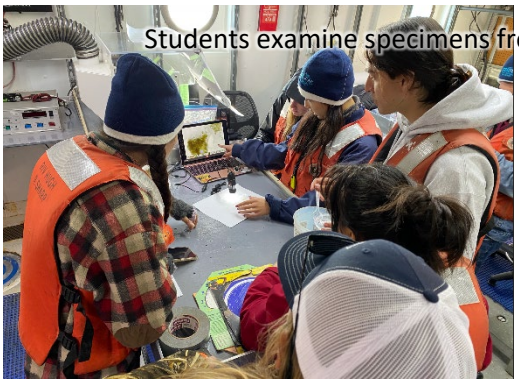
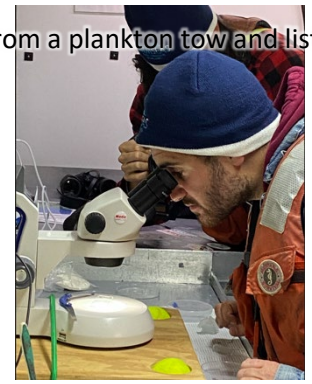
Science Technology Engineering & Math Student Experiences Aboard Ships:

STEMSEAS 3.0

by Shondricka Burrell
Morgan State University

STEMSEAS (Science Technology Engineering and Mathematics Student Experiences Aboard Ships) is an NSF-funded project that provides STEM learning opportunities for undergraduate students at sea. Built on a model of experiential learning, through STEMSEAS, undergraduate students (science majors and non-science majors) can participate in 6-10-day expeditions where they engage in Earth and marine science learning and mentored research experiences. The STEMSEAS project is truly transformative as students experience earth and marine science while living, eating, and learning aboard a research ship. [See: stemseas.org]

STEMSEAS has its origins in a conversation aboard the *JOIDES Resolution* (the JR) during a School of Rock expedition which provided professional development for teachers. Similar to School of Rock for teachers, the proposed model would leverage space aboard UNOLS (University-National Oceanographic Laboratory System) Academic Research vessels to extend immersive science education experiences for undergraduate students (Cooper & Lewis, 2017). Sharon Cooper and Jon Lewis responded to the Fall 2015 GEOPaths solicitation with a project aimed at the following goals:

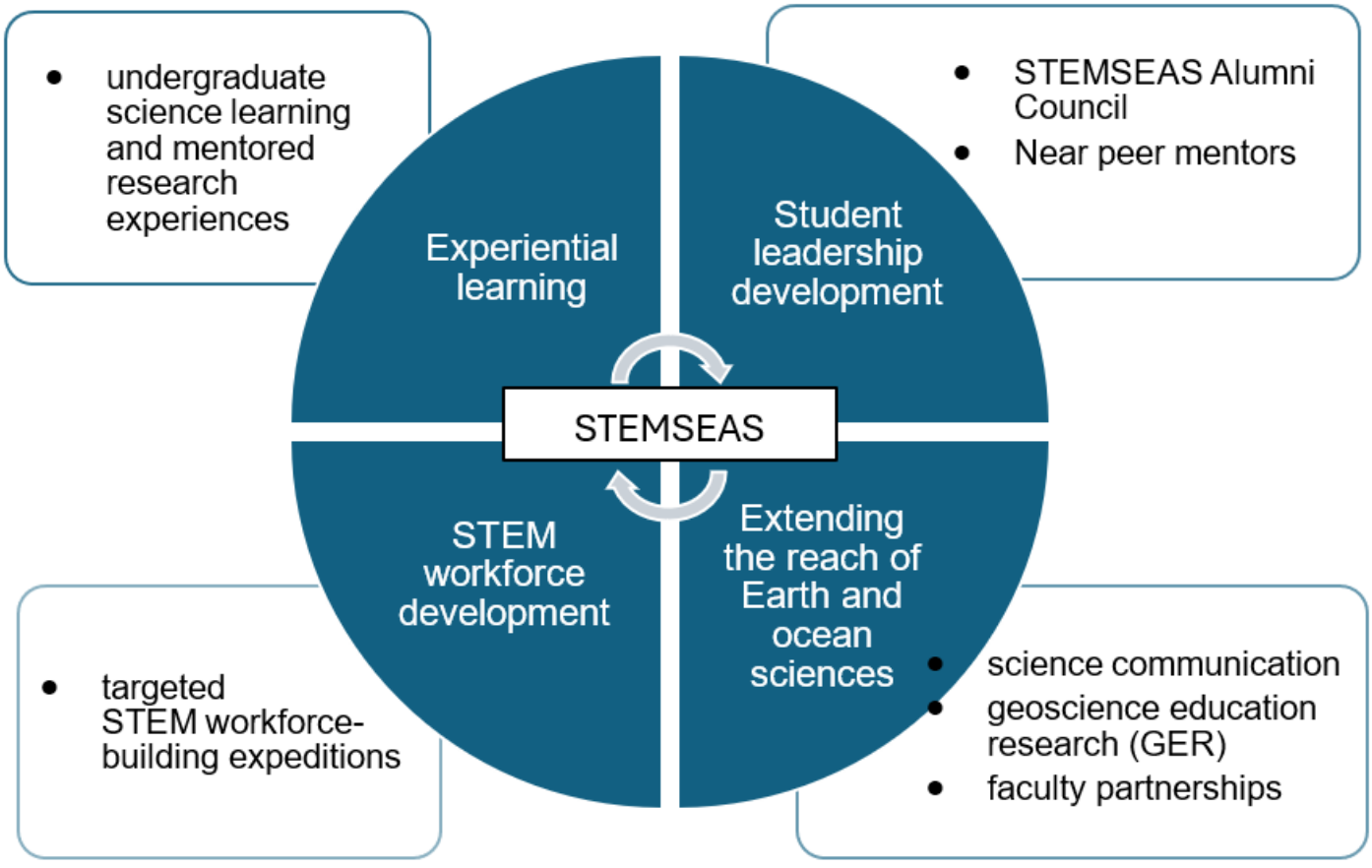

Students examine specimens from a plankton tow and listen to the career trajectories of marine techs aboard the *R/V Hugh Sharp* (2024).

- enhance STEM learning and learning environments for undergraduate students;
- extend the reach of the Earth and marine sciences to students at both 2-year and 4-year institutions; and
- contribute to the expansion of the STEM learning ecosystem and consequently contribute to the building of the STEM workforce specifically in the Earth and marine sciences.

Ten years later, STEMSEAS continues to provide engaging learning experiences at sea. STEMSEAS 3.0 has expanded to include two additional members of the PI team — Lisa White and Shondricka Burrell. These new PIs bring specific expertise to the project — science communication (Lisa White) and science/geoscience education research (Shondricka Burrell). In addition, STEMSEAS has launched partnerships with 2YC faculty and faculty at HBCUs (Historically Black College and Universities) in alignment with the goal of expanding the reach of Earth and ocean sciences to undergraduate students.

<u>Experiential learning.</u>

- STEMSEAS participants learn about the geology of local relevance to their transit.



- STEMSEAS participants also engage in mentored research experiences which may include science experiments, science observations, and data collection, alongside chief scientists, science and science education faculty, marine technicians, and near peer graduate student mentors.
- Students also have the unique experience of living and learning aboard a ship at sea.

Student Leadership Development.

- STEMSEAS alumni can serve on the Alumni Council producing monthly newsletters, conducting outreach, and contributing student perspectives on program implementation.
- Graduate students participate in pre-expedition planning meetings with the chief scientist, co-chief scientists, and members of the STEMSEAS PI team.
- During expeditions, the graduate student may participate in expedition planning meetings with the scientists and shipboard leadership team and serve as near peer mentors for undergraduate participants.


HBCU faculty share their expertise aboard the *R/V Armstrong* (2023)

Extending the reach of the Earth and ocean sciences.

- STEMSEAS 3.0 developed two forms of science communication. This communication takes the form of a newly developed website accessible at stemseas.org as well as a dedicated YouTube channel found at:


Students actively engage in mentored data collection with the chief scientist aboard the *R/V Hugh Sharp* (2024).

https://youtube.com/playlist?list=PLdZ8QCbzmLzoHNnwclW_pUCuE8Ukupvjh&si=gYg6KvaK6dgs_jnK

- In addition, there is exploratory science and geoscience education research (GER). The research work aims to understand the efficacy of the STEMSEAS model in supporting student science interest development and transformative learning (Pugh, 2020).
- Partnerships with faculty at 2YCs (two-year colleges) and HBCUs (Historically Black Colleges and Universities) engage both instructors and students. Faculty can experience STEMSEAS during targeted expeditions for educators. These faculty can then incorporate content into their curricula and encourage students to apply for and participate in STEMSEAS.
- There is a STEMSEAS blog where participants are encouraged to reflect on their experiences at sea. You can access the blog with current as well as archived posts dating back to 2016 on the STEMSEAS website, https://stemseas.org/participants/.

STEM workforce development.

- The 2025 expedition season included two expeditions intentionally designed to engage undergraduate students in exploring specific career opportunities.

- The cyberinfrastructure expedition exposed students to careers in cybersecurity aboard sea-going vessels.
- The marine tech transit engaged students in the multifaceted duties, responsibilities and skills used by marine techs while out to sea.

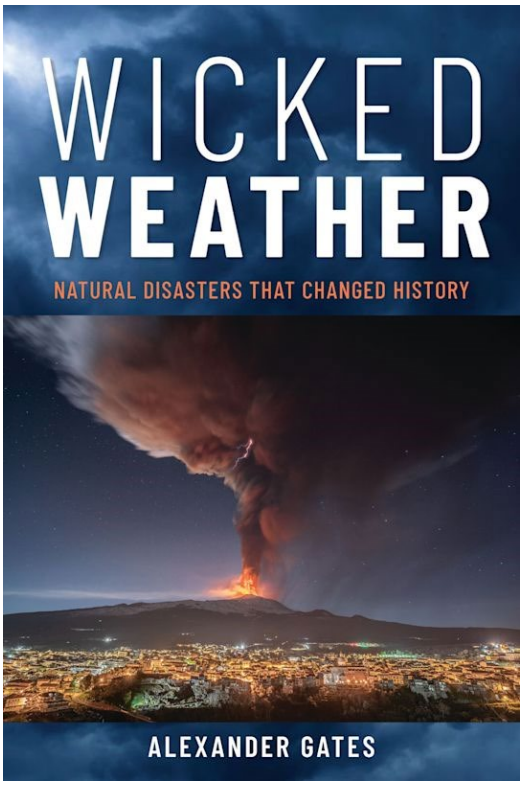
[Read STEMSEAS participants and faculty mentors blog about their experiences at sea.]
In addition, STEMSEAS has a presence in the Earth and Ocean Sciences professional communities. This academic year thus far we have hosted technical sessions including both oral and poster presentations at the 2025 Annual Meeting of Geological Society of America (GSA), 2025 Annual Meeting of the American Geophysical Union (AGU), and there will also be a presentation at the 2026 National Association of Research in Science Teaching (NARST). STEMSEAS is currently preparing to celebrate 10 years at the upcoming Ocean Sciences Meeting (OSM). If you are attending the upcoming 2026 OSM in Glasgow, Scotland, stop by our booth and please join our technical sessions scheduled for Thursday and Friday. STEMSEAS alumni, mentors, and members of the PI team will give oral and poster presentations on their experiences at sea and related research. The technical session is entitled, *Where Are They Now? Impacts of Transformative At-Sea Experiences for Undergraduates and Their Mentors.* The poster session is scheduled for Thursday (ED44C). The oral presentation session is scheduled for Friday (ED52A).

STEMSEAS participants try on immersion suits before sailing on the 2026 *R/V Atlantis* expedition.

My new book on how natural disasters have changed human history is almost out!

by Alec Gates
Rutgers University

Have you ever thought about how much Earth Science influences world history? Well, it does a lot and in some really fascinating ways. Even single natural disasters can have a major impact on history. The Americans likely would not have won the American Revolutionary War if it wasn't for a major hurricane. Several South American countries would have taken much longer to become independent from Spain if it wasn't for a strong earthquake. China wouldn't have become a communist country if it wasn't for a major flood. The French Revolution may not have happened if it wasn't for a volcanic eruption. You can read about these and many other astonishing examples in my new book *Wicked Weather: Natural Disasters that Changed History* which will be released on February 19, 2026. It is available on Amazon or from the publisher at the link below.



https://www.bloomsbury.com/us/wicked-weather-9781538198933/ --- You can get 20% discount by using this code: **GLR BD8**

News & Notes From The President

by Steve Lindberg
University of Pittsburg at Johnstown

Are you planning on attending the March 21-24 meeting of the Northeast Section of the Geological Society Of America? This year the meeting is being held in Hartford, Connecticut with the theme "New England and Beyond: Investigating the Lithosphere, Hydrosphere, and Anthroposphere". NAGT Eastern and Northeastern Sections will be there in the exhibit hall! We are currently working out the details with Joanna Latham, president of NAGT Northeastern Section to co-sponsor a booth. Our joint section sponsored NAGT booth will have an assortment of NAGT give-away items and information to encourage new membership in either of our sections. If you are an NAGT member and plan on attending , we can certainly use extra volunteers to assist in "meet and greet" at the booth! You can stop by the booth and spend some time meeting other NAGT members and encouraging membership.

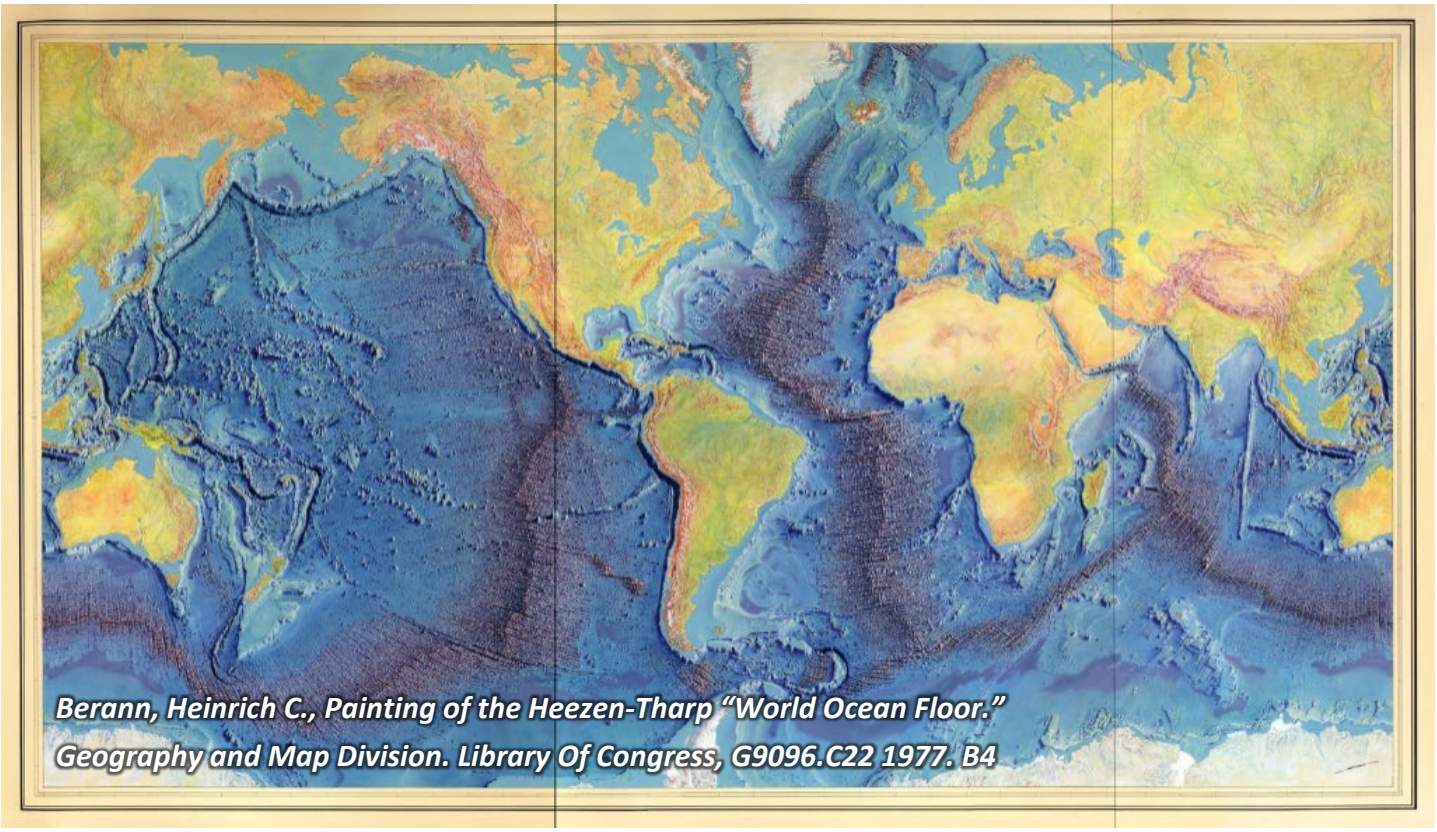
We are also in the process of trying to arrange an *NAGT member luncheon* for either Sunday or Monday during the conference. Once all details are finalized an email notice with registration information will be sent to all NAGT members.

Hope to see you at GSA in March !

New England and Beyond: Investigating the Lithosphere, Hydrosphere, and Anthroposphere

The **2026 Meeting of the Northeastern Section** of GSA will be held in Hartford, Connecticut, on **22-24 March**. Hartford is located in the Mesozoic Hartford rift basin within the geologically diverse Paleozoic accreted terranes of New England. The Hartford basin contains a rich geologic history with three regionally extensive basalt lava flows and a world-class pillow basalt locality. The sedimentary section hosts dinosaur footprints that are featured at the nearby Dinosaur State Park. Pleistocene glaciation left its mark with numerous glacial features including drumlins, eskers, and glacial deltas. This complex geology presents numerous challenges in terms of anthropogenic environmental impacts. From Hartford there is easy access to the Connecticut River, the Connecticut shoreline and Long Island Sound, and the Berkshire Mountains. The Hartford Convention Center is the meeting site and is just a short walk to numerous restaurants and the Connecticut Science Center.(https://www.geosociety.org/GSA/GSA/Sections/ne/2026mtg/home.aspx)

The University of Pittsburgh at Johnstown ***Geology Club*** will also be present at the March 21-24 GSA Northeast Section meeting in Hartford, Connecticut. Our booth at northeast section meetings has become somewhat of a tradition; and we're looking forward to being at GSA once again this March! If all goes as planned, our club booth will be adjacent to the joint NAGT Eastern-Northeastern Section exhibit hall booth! Hope to see you this March at GSA!



Berann, Heinrich C., Painting of the Heezen-Tharp "World Ocean Floor." Geography and Map Division. Library Of Congress, G9096.C22 1977. B4

The 'other' map that changed the world

by Steve Lindberg
University of Pittsburg at Johnstown

William Smith (1769-1839), the well-known Oxfordshire, England geologist often referred to as "The Father Of English Geology" is credited with stating "Each stratum contained organized fossils peculiar to itself, and might, in cases otherwise doubtful, be recognized and discriminated from others like it, but in a different part of the series, by examination of them."; a key description to his Principle of Faunal Succession. William Smith worked as a surveyor and eventually became a supervisor for the digging of the Somerset Canal in southern England. Smith recorded the fossils found within the ex-posed strata, and noticed the sequence in which they occurred. This same sequence of fossils could be observed in other rocks across England. Based on the rock strata and fossils, Smith began to make geologic maps of England. He was not the first geologist to make a geologic map; but he was the first to use the correlation of fossils to produce a geologic map. In 1815 the results of his work produced the first geologic map of England, Wales, and part of southern Scotland. This map of an entire country was a first, and has been referred to as "The Map That Changed The World." Smith's geologic map most certainly deserves the well-known status; but there are other map "firsts" that probably de-serve equal, if not more notoriety in the geosciences.

This is that map.

If you have spent any amount of time teaching or working in the geosciences, taken an introductory course in earth science, physical geology, or geography; then you have seen this map. It ap-pears in whole or part within textbooks, posters, and wall charts; yet few people know the story be-hind it. The map is far removed in time from Smith's map; and it revealed an aspect of geology that was previously unknown or ignored.

Marie Tharp (1920-2006) is possibly one of the most overlooked geoscientists in recent history. Born in 1920 in Ypsilanti, Michigan, her father was employed as a soil surveyor for the United States Department of Agriculture. Marie's interest in the field of geoscience, and in particular mapping, may have been fostered by her accompanying her father

DETAIL OF THE NORTH ATLANTIC SEAFLOOR
Berann, Heinrich C., Painting of the Heezen-Tharp "World Ocean Floor." Geography and Map Division. Library Of Congress, G9096.C22 1977. B4

during his fieldwork. Tharp completed a master's degree in geology in 1944 at the University of Michigan at Ann Arbor. In 1948 Tharp moved to New York City and became one of the first women to be hired at the Lamont-Doherty Earth Observatory.

While at Lamont-Doherty Marie Tharp met and began to collaborate with Bruce Heezen, an American geologist who was working on ocean cartography. The US Navy had developed echo sounding, a form of sonar that used sound waves to measure ocean depth; Tharp used this data to plot ocean depth profiles. These profiles were long thin lines of measurements taken along ship tracks. Interpreting these fragments into a coherent picture of the seafloor was an enormous challenge.

In 1952 Tharp was able to create a series of six sea floor profiles that stretched east to west across the Atlantic Ocean. Marie Tharp's interpretation and mapping of the bathymetric data with Heezen resulted in the first detailed map of the world's ocean floor. On her profiles the size and extent of the Mid Atlantic Ridge were obvious. The presence of a central rift valley along the ridge would soon help support the theory of plate tectonics.

In 1957, Tharp and Heezen published their first ocean floor map of the North Atlantic. They both continued to work on other maps that included the South Atlantic, Red Sea, Arabian Sea, and Indian ocean. This continued detailed mapping resulted in the discovery of a worldwide mid ocean ridge system. In 1977, they employed the talents of the Austrian painter Heinrich Berann to produce the full color map titled The World Ocean Floor.

1961 photo of Marie Tharp at Lamont-Doherty.
Lamont-Doherty Earth Observatory & the estate of Marie Tharp.

Unfortunately, Marie Tharp's work was not officially recognized until later in life. Her awards would include the 1978 National Geographic Society Hubbard Medal, the 1996 Society of Woman Geographers Outstanding Achievement Award, the 1999 Woods Hole Oceanographic Award, and the 2001 Lamont-Doherty Earth Observatory Heritage Award. In 1997 The Library Of Congress recognized Marie Tharp as one of the greatest cartographers of the twentieth century. Marie Tharp died of cancer on August 23, 2006, at the age of 86.

Outcrops, Winter 2026: “Mass Wasting”

I came across some older photos of "geology in action” that some of us might have experienced. This was a December 28, 2007 large rockfall that blocked the main road, route 271 "Easy Grade" up to the West Hills region of Cambria County, Johnstown. This was a very large rockfall from the vertical exposed hillside that closed the road for a few months; it broke through the large protective steel fence and barrier, slid across the road and into the hillside on the opposite side. When PennDOT arrived we were politely asked "What do you think?". My answer was "Pretty sure we underestimated the *gravity* of the situation". We did find some assorted fern fossils! This rock formation is the Carboniferous Conemaugh Group, present within most of western Pennsylvania. The Conemaugh Group is approximately 900 feet in thickness and consists of shales, siltstones, sandstones, limestone, iron ore beds, and several minor coal seams. Coal miners referred to the Conemaugh Group as the “lower barren coal measures”. The top of the Conemaugh is marked by the Pittsburgh Coal seam and the bottom by the Upper Freeport coal seam. The Conemaugh Group is very well exposed in many locations throughout Johnstown and Cambria County. All photos by **Steve Lindberg**, 2007.

To AI or not to AI, that is the question

by Steve Lindberg
University of Pittsburg at Johnstown

I find myself in a continual self-debate over the use of AI for personal, educational, and student use. For better or worse, regardless of how we view AI, it is here to stay and will continue to increase in use, accuracy, and ability to produce a summary of information on a required topic. For this spring semester 2026 I am allowing the students enrolled in my Earthquakes and Volcanoes course to use AI with some restrictions. In my course syllabus I used the first policy statement (included below) from the University Of Washington, and modified it to specify my university and course. I do not assign a term or research paper; so I expect students will be limited to utilizing AI for questions on labs and homework. By no means do I consider this a commitment to use AI; and currently view it as an experiment during this semester and current course.

It is worth taking some time to read through the policy on use of AI found at "Purdue University, Libraries And School Of Information Studies". "AI tools can significantly enhance productivity across professional, educational, and personal tasks. Explore the subpages to discover AI tools tailored to your specific needs." https://guides.lib.purdue.edu/c.php?g=1371380&p=10592660

The Purdue University website describing the use of AI is quite informative and includes accepted ways to cite use of AI in APA, MLA, and Chicago style format. The fact that AI generated content can now be cited using accepted formats, is in itself a statement on the presence and use of this technology. I most certainly welcome comments and feedback.
'Til next issue of the *Bulletin*, Cheers!
Steve

The following is taken from AI use guidelines published by The University Of Washington, Seattle, Washington. These AI policy use statements can be found at: https://teaching.washington.edu/course-design/ai/sample-ai-syllabus-statements/

1. For instructors who allow AI use with some restrictions
In this course, students are permitted to use AI-based tools such as ChatGPT, Copilot on some assignments. The instructions for each assignment will include information about whether and how you may use AI-based tools to complete the assignment. All sources, including AI tools, must be properly cited. Use of AI in ways that are inconsistent with the parameters above will be considered academic misconduct and subject to investigation. Please note that AI results can be biased and inaccurate. It is your responsibility to ensure that the information you use from AI is accurate. Additionally, pay attention to the privacy of your data. Many AI tools will incorporate and use any content you share, so be careful not to unintentionally share copyrighted materials, original work, or personal information. Learning how to thoughtfully and strategically use AI-based tools may help you develop your skills, refine your work, and prepare you for your future career. If you have any questions about citation or about what constitutes academic integrity in this course or at the University of Washington, please feel free to contact me to discuss your concerns.

2. For instructors who prohibit AI use
Note: Instructors have the right to prohibit any use of AI, but because no technology currently exists that can reliably identify when a student uses AI to complete an assignment, policing student use of AI has the potential to be both time-consuming and unsuccessful. All work submitted for this course must be your own. Any use of generative AI tools when working on assignments is forbidden. Use of generative AI will be considered academic misconduct and subject to investigation The assignments in this class have been designed to challenge you to develop creativity, critical-thinking, and problem-solving skills. Using AI technology will limit your capacity to develop these skills and to meet the learning goals of this course. If you have any questions about what constitutes academic integrity in this course please feel free to contact me to discuss your concerns.

3. For instructors who allow AI use without restriction

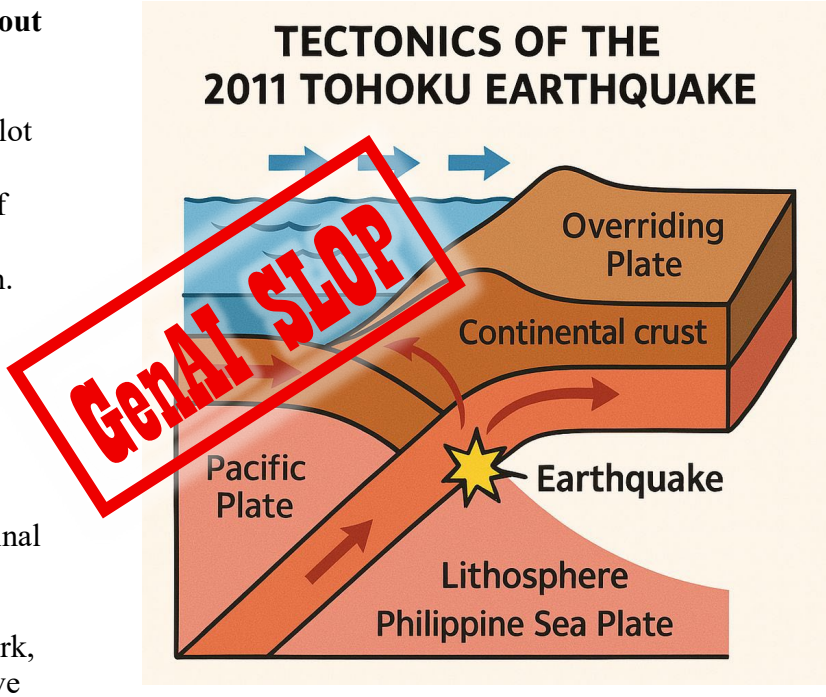
Students in this course are encouraged to explore the use of AI-based tools such as ChatGPT, Copilot when completing assignments. All sources, including AI tools, must be properly cited. Use of AI without proper citation will be considered academic misconduct and subject to investigation. Please note that AI results can be biased and inaccurate. It is your responsibility to ensure that the information you use from AI is accurate. Additionally, pay attention to the privacy of your data. Many AI tools will incorporate and use any content you share, so be careful not to unintentionally share copyrighted materials, original work, or personal information. Learning how to thoughtfully and strategically use AI-based tools may help you develop your skills, refine your work, and prepare you for your future career. If you have any questions about citation or about what constitutes academic integrity in this course or at the University of Washington, please feel free to contact me to discuss your concerns.

AI will ruin our society

by Callan Bentley
Piedmont Virginia Community College

Many modern products infuse a computational "autocorrect on steroids" that makes predictive constructions following user prompts. This is unfortunately referred to as an artificial "intelligence," though **it is not intelligent.** True intelligence is the ability to acquire and apply knowledge and skills, reasoning and building off basic concepts to achieve higher-level integrative applications of one's understanding. It really bugs me that we have all fallen into the habit of calling applications like ChatGPT "artificial intelligence." True artificial intelligence may someday arrive – what is dubbed "Artificial General Intelligence," (AGI) but that is not here yet. Instead, currently we have a suite of chatbots that utilize large language models to spin up responses to human-generated prompts. These are known as "generative AI" (hereafter, genAI).

These genAI chatbots prove their utter lack of deeper conceptual understanding when they render



"slop" like the nonsensical tectonic diagram at upper right: This is slick and "looks legitimate," but it's **fundamentally** incorrect. The structure of the plates is wrong; almost all the arrows are wrong; some of the labels are wrong. It's not intelligent in any way, shape, or form.

Administration should provide institutional support to showcasing the risk of using genAI to both faculty and students. Everywhere, emphasis must be placed on the maxim from Terry Doyle that "the one who does the work does the learning." If students deploy genAI instead of their own intellect, their intellect is the one that suffers. If professors deploy genAI instead of their own thoughtful professional practice, they lose their touch, they degrade their own relevance. Any institution that encourages students and professors to embrace genAI undermines its own integrity and honor.

If the mission of an institution is "to strengthen our community by empowering students to realize their full potential and achieve economic and social mobility through the transformative power of education," then any use of genAI is only ethically permissible if it serves that mission. Any use which runs counter to that mission of empowerment and transformation is a violation of the integrity of the school. We want to foster intelligence among our students, and that means making them **do the work** of research, of study, of writing, of synthesis, and of presentation. GenAI can deprive them of that effort, and thus of the benefits that come from doing the

work. When we lift weights at the gym, the work of lifting the weights imparts fitness to our bodies. If there were a machine that would lift the weights for us, we would be fools to opt for its use.

We must consistently and unambiguously center this perspective for our students. They are at the center of their learning; if genAI has a role to play at all, it should be peripheral and supporting.
The "hallucinations" produced by genAI pollute the body of human understanding. Fake citations, fake facts, fake imagery, fake video – mixed in with real scholarship, tested data, valid documentation. Why would society **choose** to mix garbage in with its nutrition? Do we want to drive our society toward a world where every human is faking it through their GenAI? Students faking learning; Professors faking instruction? Writers faking journalism? Politicians faking governance? Lawyers faking jurisprudence? Therapists faking psychiatry? Doctors faking surgery?

That is a bleak vision of a degraded world. We must fight it. 

Want to contribute to the *Bulletin*?

That's great – I want your articles, essays, photos, travelogues, book reviews, and more.

Please send them to cbentley@pvcc.edu as **UNFORMATTED** Word doc attachments. Supporting imagery should be attached as *full resolution* files. Please don't attempt to format your imagery or Word doc – I spend ***hours*** undoing well-intentioned formatting for each issue.

The spring meeting of the NAGT Eastern Section has been rescheduled to May 7, 8, and 9.

I apologize for this change, but it turns out that the previously-selected weekend was also graduation weekend for the University of Virginia. All the hotels in town were either already booked or else exorbitantly priced.

The location remains: Piedmont Virginia Community College in Charlottesville, Virginia.

I'll forward meeting details soon, but wanted to get this newsletter out as soon as possible, so stay tuned!

- Callan Bentley
Meeting organizer

Nominate your peers!

(Nominate yourself!)

Information about all our Eastern Section awards can be found on our section website. Please note the deadline is being/has been changed to February 1! So start thinking and get those forms filled out now! Completed nomination forms should be sent to Amy Baer at sciencebaer@gmail.com. However, you must place your nomination via the online forms found on the National NAGT web site at http://nagt.org/nagt/programs/oest.html

Here is a list of our awards. Perhaps there is one with your (or a colleague's) name on it!

OUTSTANDING EARTH SCIENCE TEACHER

The OEST Awards program was adopted by NAGT in 1971. Its purpose to honor pre-college teachers of earth science, their excellence and commitment to teaching and teaching earth science

DIGMAN AWARD FOR EXCELLENCE IN GEOSCIENCE EDUCATION

The Digman Award is designed to recognize an individual who works to bring geoscience to the general public. We look for individuals who are not teachers, but work in a capacity that educates the general public in areas of the geosciences. Museum directors, curators and assistants, state survey employees, mine and quarry public relations people would all qualify for this award. The nomination information for this award is also on our section website.

JAMES O'CONNOR MEMORIAL FIELD CAMP SCHOLARSHIP

The James O'Connor scholarship is given to a college geology or earth science major who is attending a geologic field camp course (typically over the summer) as part of their college degree program. The $500 scholarship assists the student in covering the expenses of their field camp. Nominate a student currently enrolled in your geology program. Nomination information appears on the section website.

DISTINGUISHED SERVICE AWARD FOR THE EASTERN SECTION

The Distinguished Service Award is given to a member of the Eastern Section (still actively teaching or retired) who has, over the years, contributed to the growth and activities of the Eastern Section. This person should have a history of continued service to the Eastern Section. Nomination information appears on our website.

JOHN MOSS AWARD FOR OUTSTANDING COLLEGE TEACHING

The John Moss award is reserved for instructors and professors who, at the college level, model and promote outstanding teaching in the geosciences. Nomination information appears on section website.