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PREFACE:

The Geoscience Information Society (GSIS) was established in 1965 as an independent nonprofit professional society. Members include librarians, information specialists, publishers, and scientists concerned with all aspects of geosciences information. Members are based in the United States, Canada, Australia, Sweden, Taiwan and the United Kingdom.

GSIS is a member society of the American Geosciences Institute and is an associated society of the Geological Society of America. The GSIS annual meeting is held in conjunction with the annual GSA meeting, and the papers, posters, and forums presented are a part of the GSA program.

Posters of the papers provided in these proceedings were given at the 2018 annual Meeting of the Geological Society of America held in Indianapolis, Indiana, November 4-7, 2018. Papers are arranged in the same order as the poster presentations. Where the entire paper is not available, the abstract is provided with the permission of GSA. Posters were presented all day with the authors available during a two-hour session.

The proceedings in this volume are divided into two parts:

1. Poster papers presented at the GSA Poster Session No. 178: Geoscience Information needs in Education and Research
2. GSIS Meeting Supplemental Materials

Thank you to all our poster presenters, the leadership of GSIS, and to the session conveners'/proceedings editors who have preceded us for their hard work in the name of the Society and their contributions to our profession.

Cynthia L. Prosser
GSIS Technical Session Convener 2018
Part 1: GSA Poster Session No. 178

Geoscience Information
Needs in
Education and Research

Technical Session Convener

Cynthia L. Prosser
November 6, 2018
Our Time Around the Lake:
A Hiking Tour Historical Geology Group Project

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A student group work project involving the creation of a guided hiking tour matched to the geologic time scale has the advantage of informing public through outreach, while reinforcing concepts in a historical geology course. In this project, students collaborated on developing a hiking tour around Devil’s Lake in Devil’s Lake State Park, Wisconsin, but it can be replicated nearly any place imaginable. Students worked in teams to create information views for individual time periods which were enhanced with visuals in a google drawing. The individual drawings are accessed via hyperlinked buttons on an online map of the hiking path. The entire project is then organized into a google site and made available to the public.

To create the information views; geologic time periods were broken out and/or lumped accordingly with the number of groups desired, corresponding with the course enrollment. Students worked in groups to first develop a 600 – 1,200 word summary of their assigned time periods. After feedback is received from the instructor the students adjust their write-ups as needed and incorporate them into a google drawing. The students then work to enhance the drawings visually with various figures, which may include: a map of the tectonic plate alignment (where appropriate), flora and fauna present, type environments, etc. Very little guidance was given allowing for creativity, although some standardization may help increase the overall appearance in future applications.

To create the map; the instructor broke individual trail segments into geologic time units. The map scaling was accomplished using the split command in ESRI ArcMAP. Other elements, such as the lake outline, park roads and parking areas were digitized from various sources. To incorporate the actual location geology; the map scale was adjusted to intersect a great unconformity outcrop encountered on the hiking trail.

Poster available online via GSA website:
https://gsa.confex.com/gsa/2018AM/webprogram/Paper323397.html
Use Your Neighbors Wisely: Sharing Best Practices in Sedimentary Geology

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For the past three years, faculty who teach Sedimentary Geology courses from diverse higher-education institutions around Indiana have gathered in early August to exchange ideas about discipline-specific teaching and learning. The overall aim is to improve our courses and reinvigorate our teaching by: learning about how others structure their course, sharing
instructional materials and assessments that others have found to be effective, gaining inspiration to implement new assignments/labs/field trips, and discussing common challenges and solutions. As a direct result of our workshops, nearly all participants have tried new approaches in their courses, including revising assignments or assessments, and/or reflecting on learning goals and outcomes. So far, about half of the faculty members who teach Sedimentary Geology at liberal arts colleges and state universities across Indiana have participated. Each workshop has a theme, such as field trips or project-based learning and assessment. Local pedagogical experts have been involved to share best practices and individuals from the Indiana Geological and Water Survey were invited to describe available resources. We have created a shared folder for instructional materials that serves as an on-demand resource. The group has been an important sounding board for such diverse topics as new textbook development, minimizing risk on field trips and new sample acquisition. These inexpensive workshops have created a valuable new community of colleagues with whom we can have inclusive, in-depth discussions and share information about local field trips and other resources for teaching sedimentary geology in Indiana.
Cave Pearl Data Logger Project – Building an Online Platform for Broader Impact and Educational Outreach

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Online outreach can be challenging for technical projects because the audience for self-directed learning material is diffuse and difficult to identify. The Cave Pearl Project developed an open-source data logging platform that is easy to assemble and capable of multi-year operation. The system was published formally in 2018, with a project website/blog documenting the project since its inception in 2013. This has now reached >80k unique IP visits a year, providing insight on viewership demographics and project-level impact. The site’s content can be grouped into three broad categories: 1) Technical how-to guides, with detailed build instructions and calibration procedures. 2) Narratives on the challenges of deploying instruments in the field. 3) Classroom resources based on material used in the problem-based learning course EARTH 360-Instrumentation at Northwestern University. Traffic is dominated by organic Google searches for entry-level material, and secondarily by links from Pinterest and Reddit. Seasonality is consistent with school calendars in North American and Western Europe, indicating pedagogical use. Traffic for the more advanced technical material is driven by referrals from popular technical forums (e.g. Arduino.cc, Dangerous Prototypes, Quora, etc) Low but continuous traffic arrives from the project presence on open-source community sites like Hackaday, Publiclab, Scistarter, etc. Field reports draw negligible interest, and in 2018 that material was migrated to Twitter. While the USA represents 50% of the overall viewership, the per capita by country traffic is biased towards Western Europe, with Germany leading. South and Central America, Africa, and most of Asia are low (with the exception of India), implying this material is not yet reaching the scientific and educational communities who could benefit most from powerful but inexpensive open-source instrumentation.

Poster available online via GSA website:
https://gsa.confex.com/gsa/2018AM/webprogram/Paper320230.html
A New Model for Science Communication and Outreach: 
Interaction, Instructional Design, and Inclusion

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Outreach presents a powerful venue to disseminate science to the public and policy makers. As we see with topical environmental issues involving water, climate and resources, scientists need to revise current communication techniques to improve science literacy by reinventing the science education outreach paradigm.

We start by embedding a local earth sciences professor, familiar with the field area, as a PI. Benefits of this approach provide connections with local media, regional geological organizations, service clubs, land access, and sense of place. Her role is to manage the broader impacts, which includes producing instructional materials about the research. Core to these materials are short video-tutorials, filmed in the field, of CO-PIs and prominent regional geologists discussing the local geology, sampling techniques, and geochronology. The recordings are available to students and the public on the Ruby Mountains Geology, Geochronology and Education YouTube Channel. These tutorials are linked to interactive fieldtrip guides using Google Maps the public can download prior to a hike or a road trip so they can be viewed in areas with limited cellular service.

Content modules regarding Metamorphic Core Complexes, Geochronology, and Methods are in development and will be accessible as open educational resources (OER) in Canvas Commons for all geoscience educators to access. The content modules include learner outcomes, short lectures, aligned self-check assessments, the interactive Google map of the field area, and links to additional resources. To increase accessibility to all people interested in the earth sciences, all instructional materials produced are Americans with Disabilities (ADA) Act compliant; this means the videos are closed captioned, and figures and photographs have alt text and can be read by a screen reader.

An important aspect of this outreach approach is to build the instructional resources with a multi-disciplinary team of English, graphic communications, and education undergraduates. Students in these disciplines will lend their knowledge in communication, illustrations, video editing, and pedagogy while gaining experience in the sciences. This model extends science dialogue out of the laboratory and into the homes of non-scientists, community members and policy makers.

Poster Available online via GSA website:
https://gsa.confex.com/gsa/2018AM/webprogram/Paper320407.html
Fairy Godmothers of Foraminifera?
Using Storytelling to Communicate Marine Science

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Storytelling represents one of the oldest, most social forms of communication. It therefore can offer a unique, personal approach to science communication and to establishing a dialogue between scientists and the general public. “Once Upon a Time… a Scientific Fairy Tale” draws upon the versatility of storytelling to promote scientific knowledge to children and adults through illustrated short stories and poetry. The project was organized in 2016 by an international group of marine science PhD students and postdoctoral researchers at the University of Bremen. In 2017 the first “Once Upon a Time…” volume was published with funding from the “Show your Science” competition sponsored by the German science communication foundation Science in Dialogue (Wissenschaft im Dialog). The 12 stories and poems in this volume relate various marine science themes – from marine biology, ecology, and geology to human interactions with the oceans. The stories aim to convey, in a clear and engaging way, scientific content inspired by the authors’ (the scientists’) personal research and passions. The “Once Upon a Time…” volume was published as an illustrated, free to download e-book in English, German, and Spanish. In order to reach a wider readership, the e-book is also being translated to Italian, French, Chinese, Portuguese, Hebrew, Filipino, Korean, and Russian. To promote the volume and science communication, the “Once Upon a Time…” group does readings of the stories and poetry in local schools and libraries and at science events. In addition to publishing a second volume (in progress), the group is seeking international collaboration with teachers, citizens, and scientists to expand the scope and readership of the “Once Upon a Time…” scientific storytelling network.
Development of a Multi-Level Educational Smart Device Application to Supplement Trail Interpretation at Florissant Fossil Beds National Monument

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People of all ages and educational backgrounds travel to Florissant Fossil Beds National Monument to experience the natural resources of the park. Existing trail exhibits at Florissant attempt to target this diverse audience through compelling, succinct language and avoid in-depth discussions and complex topics, instead hoping visitors will be inspired through staff interactions or bookstore offerings. Our research objective is to explore visitor reactions to “in the moment” free choice learning through visitor interaction with a multi-level smart device application, Florissant Explorer: a tool to facilitate deeper learning at the monument. This research project was in part driven by Geoscientist-in-the-Park paleontology interns, who synthesized high-level geologic concepts critical to the comprehension of Florissant’s geology and produced scripts, graphics, paleoreconstructions, and other media. Florissant Explorer will let visitors choose from three different interpretive levels: a "Junior Ranger"; an inquisitive park visitor; and an advanced science student. At each of the nine exhibits along Florissant Fossil Beds National Monument’s Geologic Trail, the application will enrich visitor experience by providing information on topics ranging from the origins of Precambrian granites and Eocene volcanics to climate methods used in paleobotany. One example of this is at the trail exhibit titled "A Mammoth Change in Climate," where the application will explain concepts as complex as major climate change illustrated in the Zachos curve. This app will be an innovative prototype with the potential for application to other National Park Service units as a national model. Florissant Explorer supports the mission of the National Park Service by fostering public education and awareness of our planet, and the multi-level nature of the application is designed to facilitate learning about the need for preservation of the natural world in students of all ages.
Implementing Social Media Campaigns and Webinars to Promote Professionalization in Paleontology

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Social media provides countless opportunities for individuals to learn collaboratively as well as contribute to scientific knowledge within digital contexts. The FOSSIL Project, a National Science Foundation-funded initiative, uses social media platforms (i.e. Twitter and Facebook) to unite paleontologists, regardless of level of expertise, as a more formalized paleontological community. In the fall of 2016, the FOSSIL Project began offering a series of webinars to promote professionalization for community members. The FOSSIL Project created four four-part webinar series in which each series consisted of four distinct webinars. Each series covered specific topics to encourage the development of paleontological knowledge and expertise, including fossil collection, preparation, identification, and curation. To bolster community involvement, members of the FOSSIL social media team produced messaging campaigns specific to each webinar series, drawing on best practices from marketing and educational research. University researchers, student interns, and museum scientists collaborated to ensure that messages were scientifically accurate, engaging, educative, and branded. The campaign for each webinar resulted in different degrees of community engagement, with the “Process of Paleontology” series seeing the greatest involvement in development and implementation, and the “Women in Paleontology” series seeing the least. Through our description of these social media campaigns and outcomes, we illustrate how social media can be used effectively to engage diverse community members fully in social paleontology via webinar development and implementation, including soliciting content, increasing attendance, and participating in social learning.
On Twitter, individuals can find and contribute knowledge to the scientific community, regardless of status (i.e. professional, amateur, or other). The paleontological community, consisting of museums and their representatives, academic researchers, amateur fossil collectors, paleontological artists and commercial fossil retailers, use Twitter and seemingly benefit from the collaborative nature of the platform. Such collaboration would represent an accessible and transparent aid for accelerating the overall advancement of paleontology. However, to date, scant research has documented the structure of the paleontological social network on Twitter or explored how it might impact the flow of information and eventual discovery. This study seeks to provide a robust description of the ways in which paleontology-specific information flows through the social network on Twitter. Using an open-source network analysis software program, NodeXL, the social network for the top four paleontology-related hashtags was sampled (n = 7,297 connections), analyzed and visualized. Members in the social network (n = 3,386) were further classified based upon a taxonomy for how they described themselves and expressed their status. Results indicate that the network includes a surprisingly diverse variety of members,
including the public (63%), scientists (23%), education and outreach entities (12%) and commercial entities (2%). Members of the public were central actors in the flow of paleontological information whereas scientists and science organizations served as key arbiters. The composition, structure and flow of information within this social network has implications for the paleontological community as it seeks to expand access, recognize the contributions of all, and support collaborations that improve the practice of science.
A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (2012) and the Next Generation Science Standards (2013) are significant for the geoscience education community because they place the teaching and learning of the Earth and Space Sciences (ESS) on par with the Life Sciences, Physical Sciences, and Engineering across K-12 education. High quality ESS instruction will require a K-12 teaching workforce that is
diverse and fully prepared to teach ESS. The preparation of future ESS teachers is challenging because the teacher education landscape is complex. Teacher preparation programs vary considerably across the country and even within states. They are impacted by many external factors, including different teacher licensure requirements across states, priorities of K-12 partners, and the impact of state and national standards documents.

Here we report on three grand challenges for future geoscience education research (GER) related to teacher education, which were developed as part of the NSF-funded *A Framework for Transformative Geoscience Education Research* project that identified priority research questions for 10 GER themes. 1) The ESS teacher workforce should reflect the diversity of K-12 learners. Future research needs to identify strategies to attract, support, and retain a more diverse K-12 ESS teaching workforce that will engage a diverse student population. 2) Teacher education programs need to prepare teacher candidates who are well-prepared to teach ESS. Effective models that incorporate ESS into undergraduate teacher preparation programs and provide quality professional development for inservice teachers need to be investigated. Finally, 3) in this changing science education landscape, research needs to explore how to prepare future and inservice teachers to promote three-dimensional learning in ESS.

Poster available online via GSA website:

https://gsa.confex.com/gsa/2018AM/webprogram/Paper319790.html
Gaining Perspective with Google Earth Virtual Reality in an Introduction-Level Physical Geology Course

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Two of the main challenges in teaching geologic features and processes in an introduction-level Physical Geology course is describing their 3-dimensional orientation and scale. Near the end of the semester, students in the course were given three locations “explore” in Google VR using the UNC Asheville’s Virtual Reality Laboratory, equipped with HTC Vives. Locations were initially selected using the Google Earth desktop program and then exported to kmz2gevr\(^1\) and then loaded onto the VR stations as saved locations in the Google VR program. The goal of the exercise is to give them perspective of the dimensions and scale of the different geologic features and processes at each location. Students worked in pairs and took turns reading the assignment questions and writing responses of the one who was immersed in the virtual reality. A short series of questions following the activity asked students to reflect upon their favorite location, where they would like to explore, and what might be some other applications for the Google Earth VR program.

The students explored the pumice cone Vulcan and the composite Tavurvur in Papua New Guinea and compare and contrast the features of each. Students can see folds and features of glacial erosion in the Alps along the Italy-Switzerland border. By “flying” high above the mountains, you get a sense of just how tall and broad this range is. The third location is set on a ridge overlooking the Grand Canyon in Arizona, where students are asked to “fly over” and “raft” down the Colorado River in Google Street View and observe the geologic features such as horizontal layers, inclined layers, rock coloring, faults, joints, sand bars, and adjoining channels.

These locations are discussed in the lecture portion of the class and this VR assignment enables students to envision the scale and dimensions of the features shown prior in photographs. Within this sandbox setting, students can also explore “outside of the photograph”, enabling them to ask more questions and make more observations about the features and processes they are seeing. In the future, the following logistics will need more attention and planning: scheduling, students with disabilities, group sizes, pre-assessment of the geologic history of the features selected, and due dates for the assignments.
1https://github.com/kbogert/kmz2gevr

Poster available online via GSA website:
https://gsa.confex.com/gsa/2018AM/webprogram/Paper321128.html
Using Spatial Multi-Criteria Evaluations to Assess Understanding and Ability in an Introductory GIS Tutorial Course

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Applied GIS skills are critical in intermediate and upper level, problem-based geology and environmental science classes and an increasingly required competency for employment. Our courses integrate civic engagement as a means of providing students with meaningful experiences for applying course content to local problems. Published tutorials are a low-cost, sustainable approach to expose more students to the breadth of GIS functions earlier in their curriculum but do not address the nuances of using local data such as access or suitability. Weekly and summative assessments are used to focus student skills on local, discipline-based problems. GIS-based spatial multi-criteria evaluation (SMCE) is a commonly used technique to investigate the suitability of land for a specific purpose based on multiple attributes. As a summative assessment tool, an SMCE-based problem is used to assess student ability to (1) access relevant data, (2) edit or process it to meet user needs, (3) analyze it, generally using logical operators and Boolean overlays, and (4) communicate the final result as a map. State scenic river designation, which includes thresholds for percent impervious area in the watershed, length percent of reach with roads within 300 ft of the river, and area percent of forest and wetland within 120 and 300 ft of the river, is an example. Results from past classes will be used to demonstrate an assessment rubric based on sophistication of the analyses. Other examples of SMCE that are applicable locally include setback requirements for nutrient management, soil limitations for residential development, and ownership and access for community scoring systems.
Assessment Methods for Undergraduate Stem Courses Integrating Geographic Information Technology

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Assessing learning outcomes is an integral component of evaluating departmental program and course success being used across campuses. Assessment is also valuable for evaluating student preparation for the workforce. In particular, recent findings from workforce surveys have identified the desired skills and abilities of undergraduate students from STEM disciplines with geographic information technology skills entering the workforce. A common core element of these surveys is demonstration of knowledge, skills, and abilities in spatial analysis and visualization as derived from use of GIS and statistical software packages. To address these common core elements, GIS faculty selected artifacts of learning, final project reports and related assignments from students who have completed courses in GIS and Spatial Analysis, in order to determine students’ ability to collect, analyze, and display spatial information using advanced geographic information technologies. Artifacts from three semesters of geographic information technology courses were each analyzed using a rubric based on multiple dimensions of learning and three levels of mastery of each dimension. After all artifacts were independently assessed with the rubric, the faculty compared outcomes and settled on final performance measures. Findings from the study indicate the majority of students attain adequate levels of mastery of spatial analysis and visualization, with a small number of outstanding and very few poor levels of mastery. Results from these findings will be used in further evaluating ideal methods for teaching spatial analysis and visualization content in geographic information technology courses as well as in a planned departmental review.
GIS and Geovisualization Methods for Assessing Impacts of the Flood of 2011 in Binghamton, NY

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The Flood of 2011 was one of the most significant floods to affect the City of Binghamton, causing extensive property damage and disrupting businesses. The flood was related to Tropical Storm Lee which dumped significant rainfall over a two day period putting properties at risk within the flood zone around the Susquehanna and Chenango rivers. This study uses GIS and remote sensing techniques to assess the land use land cover within the flood zone as well as buildings at risk. Results indicate the City of Binghamton’s flood zone is 21% urbanized impervious surface – a known factor for flood risk. 3D visualization is also used to recreate the extent of the Flood of 2011 using its high water mark to determine buildings at risk flooded by this event. These hindcasting graphics and animations are of use for future land planning and flood risk mitigation efforts in Binghamton and Broome County.
A city running dry: Cape Town, Should you be concerned about your water usage?

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And
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Charlie Norwood, VA, Augusta, GA

ABSTRACT
The availability of fresh water affects every aspect of our lives for food, general health to energy and security. A small sample survey of resident opinions in Cape Town reveals that the current water shortage in Cape Town, South Africa could be due to climate change, farming/agricultural practices, increase in human population and politics. The World Health Organization (WHO) recommends 100 liters per person per day (p/d) with a minimum of 25L/p/d of fresh water needed for basic hygiene. People in the arid Lake Chad region live with about 10L/p/d of fresh water less than recommend by WHO, similar to what we were “forced” to use during a trip to Cape Town in the summer of 2018. What can and should we learn from the Cape Town experience? One could use less water when necessary, like during the visit when we survived on 10L/p/d of fresh water. Within the city limits, greywater is being harnessed for lawn maintenance, flushing of toilets and other non-hygienic functions.

INTRODUCTION
The availability of fresh water affects every aspect of our lives for food, general health to energy and security. Although about three quarters of Earth surface is covered with water, less than one percent of the water is available as fresh water for human use. This water is not uniformly distributed; some areas have more water than the people need, for example, Canada; other areas have little or no visible water as in the case of hot deserts like the Sahara desert in Africa or Arabian desert in Saudi Arabia.

As a reminder, the vast majority of available fresh water is stored groundwater and most of that fresh water is used for irrigation. As water is withdrawn faster than it’s being replaced in the underground, we could have irreparable damage through compaction of the materials that make up of the aquifers; this compaction has led to land subsidence that is affecting Mexico City and Beijing, Parker (2019).

Greater demand is being placed on groundwater as the human population increases as seen from the magnitude and accelerated rate of demand (Rivera, 2019). This greater demand for fresh water is being compounded not only by population growth, but also increase in industries that utilizes more water. Atlanta, Georgia has a rapidly growing population which means greater demand for water, also by an increase in economic growth. Georgia has a long history of water issues with Alabama and Florida over the use of water within two particular drainage basins: the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint basins, SELC (2018).

Although there is enough water for every human on Earth, but the accessibility and quality of the water prove to be elusive to some people. Too much water or lack thereof could cause much damage to humans and to the environment. Availability of potable water is not uniform and it tends to follow some
social/economic standing where the disadvantaged low social/economic people tend to get the short end of the stick, so to speak (Isiorho 2018). Figure 1 shows the distance to water and water quality associated with social economic levels in Africa, summarized in a table format below.

<table>
<thead>
<tr>
<th></th>
<th>Low-Level social-economic level</th>
<th>Intermediate social-economic level</th>
<th>High-level social-economic level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Quality</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td>Distance to water</td>
<td>Far</td>
<td>Intermediate</td>
<td>Arms-length</td>
</tr>
</tbody>
</table>

Although some regions may have adequate water supply, the waters may have been made unfit to use through contamination either by natural or anthropogenic activities. Flint, Michigan comes to mind with the contaminated water supply (Yang, 2019).

The ongoing water shortage problem in Cape Town, a metropolitan area in South Africa (located along the Atlantic coastal region of Africa (figure 2)), should be a wakeup call for all people regarding the availability of water for all. The geographic location, climate, and human activities may have led to this “drying” of potable water supply for this city and other major cities such as Cairo, Mexico, and San Paulo. As most often is the case, we tend not to pay attention to societal problems when we are not directly affected, and a trip across the ocean brought to mind the importance of access to a potable water supply.

WATER PROBLEM(S)
A trip to South Africa in the summer of 2018 brought to our attention and served as a reminder about the importance of water to life. We heard of the water issues in South Africa before we left the United States, however, the reality of the lack of water did not hit home until a weekend visit to Cape Town, South Africa. Prior to the visit to Cape Town, we stayed in the northeast part of South Africa where there were no water issues. This changed when we visited Cape Town, located along the coast in South Africa there, we were informed the restrictions on water usage to think like a local (figure 3). Coming from the United States where water supply (in most cases) was not an issue, it took us by surprise when we were told to use a limited supply of water. Having had the experience instructing students of the need to conserve water in the midst of plenty is different from conserving water in an environment of limited water supply.

Survey
At the Airbnb/Bed and Breakfast were we lodged, there were pasted specific city ordinance/signs of instructions on water shortage in the city and tourist been required to conserve their daily water. There were examples of expectations of hygiene water usage, that is, when toilet is to be flushed. As we explored the city, we saw similar signage informing people to reduce water use due to the water shortage watch for hand washing and toilet flush triggers were disarmed. With water bottles in hands we got curious as to the cause of this problem. We decided to do an impromptu survey of the locals/residents around us in the streets, restaurants, shops and homes as to the cause or reason for the shortage of water in the Cape Town region. We asked two simple questions: “Is there water shortage?” and “What led to the shortage?” A total of fifteen individuals we “interviewed” provided varied answers with the majority of the respondents (55%) being female.
Survey Outcomes
From the response of the surveyed individuals no single reason was provided as for the reason for the water shortage in the city. Some of the residents think there is no water shortage problem, but the politicians are trying to score points by implying that there is water shortage; simply a political problem. Others attribute the shortage to climate change, some attribute it to farming/agricultural practices and the rest blamed the increase in human population. In short, several reasons were attributed to the shortage of potable water in Cape Town, from climate change, agricultural practice, and politics. During our stay in Cape Town, the local government announced/proposed a 27% increase in water tariff as a way to force residents to conserve water. This tariff idea was opposed by both businesses and residents. Tourism was impacted as visitors were told to minimize the use of water for flushing toilets, bathing, washing dishes and laundry (figure 4). We used more hand sanitizers to supplement hand washing during our stay in Cape Town.

Lessons
What can and should we learn from the Cape Town experience? During the visit, we survived with 10L/p/d of fresh water (less than the WHO recommendation) From personal experience of living in an arid region in the Lake Chad basin, people in this region have been known to live with approximately 10L/p/d of fresh water, similar to what we used during the trip to Cape Town in the summer of 2018. WHO recommends 50-100 liters per person per day with a minimum of 25L/p/d fresh water needed for basic hygiene (WHO).

How could one or should one limit the use (waste) of water? Probably, this is not the time to think of effective water usage with hurricane Dorian and record flooding events going on in some part of the United States, but one should still plan for the future. Some proposed practices may not prove to be incentives to individuals, but will make wise use of water. For example, some water utilities charge you extra for not using a stipulated minimum water amount within a month. In other words, you get penalized for using less water, that is, use a certain minimum amount of water per year as a certain minimum volume of water is needed to move “solids” along the sewage lines. The introduction of low flush toilets may not be suppling enough water to move solid wastes along sewage lines. San Francisco in the United States associated low volume toilets with stench smell in some of their neighborhood (Matier & Ross, 2011). The volume of water used in some of the low volume toilets is not efficient to effectively move those solid wastes along the sewage line as ‘low’ flush toilets seem to pose some problem (Graham, 2011).

DISCUSSIONS
People that live in arid regions do not need or require the same amount of water as those that live in equatorial or tropical settings where potable water supply is not limited. As noted above, WHO recognizes that a minimum of 100 liters of water per person per day and a minimum of 25L/p/d fresh water are needed for healthy basic hygiene. I surmise that the “limit” set by WHO may be more geared to the affluent society than those living in arid regions. The amount of water usage is strongly dependent on the life style of individuals or family as well as the demography and region. For example, Young families may tend to use more water with more frequent laundering than older families. So also Climate setting may influence the amount of water usage in an area as shown in the satellite images of a dam in Cape Town (figure 5). In arid regions, most of the water is used for cooking and irrigation while less, for bathing, laundry or for flushing toilets. Taking Showers are usually less in those areas and laundering and dish washing machines are not common like wise. Working in the Sub Sahel region of Africa where daytime temperature is about 130 degrees Fahrenheit has taught me to use water more efficiently. Could one
reduce the amount of water used and still have a healthy clean environment? The answer will depend on the individuals.

**Practical things**

What can we do to reduce the amount of water used? We have heard or read about “turning off” tap water when brushing teeth, having full load before running the laundry machine or dishwasher, water/irrigate early in the morning to minimize evaporation. Wash household dishes by hand at home which is more efficient than using the dishwasher for a handful of dishes (assuming the tap is not left running the entire time). Soak the dishes and have water in the sink, wash all the items first and rinse all at the same time. This way, one could collect the gray water for watering the garden. Flush only when there is solid waste in the toilet or if the odor is too strong from urine. This may not be suitable for most circumstances and would not be recommended for a shared bathroom. Public toilets should be flushed after every use for positive health reasons. We need to get every member of our families involved if this water conservation way is to be successful.

Involving family members and young people early in the wise use of water. Not turning the tap water full blast could save some water. My grandson and I did a simple experiment; we place a bucket in the sink, turn on the tap water for a minute, just enough to get dishes done. We did measure how much one uses by turning on the tap water full blast as against getting enough water to get the work (washing a few dishes by hand in this case) done. In one minute of running the tap, we used about three liters and when we opened the water just enough to be able to wash the dishes, we used about a liter of water. Assuming one does dish an average of one hour every day of the week for a year, this will amount to saving of 730 liters (savings of two liters per day times 365 days). Not taking long baths, running water while brushing your teeth, fixing water leaks and watering your lawn at times when there is less evapotranspiration could lead to substantial savings of water. Assuming water loss from leaks amount to one liter a day, bathing (shower) is 10 liters every other day, dish washing, not running a full load in the washing machine, bathing, etc., could lead to more than 11,315 liters/ per year. For a small city the size of Fort Wayne, Indiana with a population of about 250,000, the city could potentially save 2.829 X 10^9 liters/year. You can work with your young ones to figure out how much water you use in doors from the Unites State Geological Survey (USGS) website.

Within Cape Town, greywater is being harnessed for lawn maintenance, flushing of toilets, and other non-hygienic functions. The use of greywater helps the municipality, reduces water use, and saves the residents money through reduced water use.

**CONCLUSION**

With the current flood events in the past several months in the United States, we sometimes fail to see the undependability of water supplies in many parts of the world. We sure hope that people don’t say that we are “undependable as intermittent streams, as the streams that overflow when darkened by thawing ice and swollen with melting snow, but that stop flowing in the dry season, and in the heat vanish from their channels.” Job, 2015. Headlines like “Cape Town is experiencing its worst drought ever” does not square well with the flood events in the Midwest of the United States and other parts of the country. Though it may seem inconsequential, our actions have great impacts on the availability of potable water supplies.

Some folks may not be aware of water “battles” taking place in other parts of the world, especially in the Middle East and North Africa. However, there are also water wars in the United States, though it has not reached the point of using guns like in other parts of the world, (Gleick, 2018). We should play our part
by being intentional on using water wisely as the next major war may be over water.

**ACKNOWLEDGEMENT**

We would like to thank Ese Esan for reviewing and editing the manuscript. Our appreciation to the following for their contributions: Ogbonnaya & Ronke Harbor, Kayefi Esan, and Edmund Mansoorabadi.

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World Health Organization (WHO),  
Accessed Oct, 4, 2019

Yang, J., 2019, Why Flint residents are still dealing with water worries, 5 years after lead crisis.  
Figure 1. Shows the distance and water quality along social economic levels

Increasing distance to potable water

Improving water quality
Figure 2. Looking at Cape Town Harbor from the Table Mountain.
Figure 3. Visitors to save like a local signage

![Signage Image]
Figure 4. How to help with water usage.

![Here’s How You Can Help](image-url)

- Take short, stop-start showers.
- Only flush when you really need to.
- Don’t leave the tap running while brushing teeth.
- Wash hands less frequently and use sanitiser instead.

THINK WATER
CARE A LITTLE; SAVE A LOT.
CAPETOWN.GOV.ZA / THINKWATER
FOLLOW @CITYOFCT
Figure 5. Effect of climate change on water; satellite images of Theewaterskloof Dam, seven-year apart (January 6, 2011 and January 24, 2018) near Cape Town.

Investigating Undergraduate Students Reasoning About Socio-Hydrological Issues: Results from a Transdisciplinary Water Course

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FRANZ, Trenton

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Societies today face an array of global, water-related challenges with significant scientific dimensions within the Food-Energy-Water-Nexus. To prepare students to become tomorrow’s global citizens, postsecondary learning experiences must provide them with the ability to learn and reason about socio-hydrological issues such as agricultural water use, water quality, and water security. However, prior research has illustrated limitations in undergraduate students’ disciplinary knowledge and little research has been conducted to understand how they use this knowledge to solve problems and make decisions about socio-hydrological systems (i.e., water literacy). Here, we report on discipline-based education research from an innovative, interdisciplinary course, Water in Society, in which we – a team of faculty and graduate students with expertise in hydrology, economics, and science education - engage a diverse population of students – both STEM and non-STEM majors – from a variety of backgrounds. Principles of effective undergraduate STEM instruction underlying the course include and emphasis on active learning, socio-hydrological systems, student engagement with authentic hydrological data, and computer-based modeling tools. We investigate undergraduate students’ model-based reasoning about socio-hydrological systems. Findings provide evidence for growth in students’ conceptual understanding of water-related phenomena and model-based reasoning about socio-hydrological systems over the course of the semester. They also provide insight into how students leverage modeling tools grounded in authentic hydrologic datasets to problem-solve real-world, water-related challenges. Gain scores for pre-/post-course assessments of students’ content knowledge were predictive of their socio-hydrological reasoning. However, relationships between students’ science content knowledge and model-based reasoning about water systems differed significantly across two course projects involving computer-based models. We use these empirical findings to consider both challenges and opportunities in course design, pedagogy, and assessment that optimize student-learning experiences. Results presented here build upon previous findings from earlier iterations of the course.
Geologic Field Trip Guidebooks Web Archive

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Geoscience field trip guidebooks are indexed by GeoRef/AGI and are an important source of local geologic information that is often not found elsewhere. More and more field trip guides are found online for a short duration, in and around the time the trip was hosted. In the past, field trip guides were published or offered in print and many libraries tried to collect, or purchase them as they became available. As many field trip guides are now solely available online, purchasing print copies is not always possible. Many online guidebooks are not archived elsewhere and once the conference or trip is over, are left to languish and are often at risk for being lost as people leave the institution that hosted the trip. The Geologic Field Trip Guidebooks Web Archive seeks to create a web archive that will preserve online geologic field trip guidebooks that are not archived online elsewhere. This online collection would be free and available for researchers and scholars to use, and would be made available through the Internet Archive (https://archive.org/). The first phase will be to archive the online guidebooks cataloged in the Geologic Guidebooks of North America Database (GGNAD) that are not already preserved elsewhere. The web archive would be a full text archive that would complement the GGNAD. This project is currently in development and has been funded through the Ivy Plus Web Collecting Program.
## Introduction

Geoscience field trip guidebooks are indexed by GeoRef/AGI and are an important source of local geologic information that is often not found elsewhere.

Many field trip guides are now solely available online and only for a short time. While libraries used to collect print and published guides with the move to the online environment, purchasing print copies is not always possible. Many online guidebooks are not archived elsewhere, and are at risk for being lost.

The Geologic Field Trip Guidebooks Web Archive seeks to create a web archive that will preserve online geologic field trip guidebooks that are not archived online elsewhere. This online collection will be free and available for researchers and scholars to use, and would be made available through the Internet Archive.

### Useful Links:
- [https://archive.org/](https://archive.org/)
- [https://archive-ilt.org/home/ivyPlus](https://archive-ilt.org/home/ivyPlus)
- [https://guidebooks.americangeosciences.org/vufind/](https://guidebooks.americangeosciences.org/vufind/)

## Web Archiving

<table>
<thead>
<tr>
<th>What is Web Archiving?</th>
<th>How does Web Archiving Work?</th>
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<tbody>
<tr>
<td>Web archiving is the process of creating and storing copies (or snapshots) of live websites to ensure that they are preserved and remain publicly accessible for future use.</td>
<td>Sites, typically captured using automated web crawlers, which systematically identify and follow hyperlinks on selected websites (referred to as seeds), copying and storing information as they work. Ivy Plus Libraries uses the Archive-It service to crawl websites. Its crawler is called archive.org_bot.</td>
</tr>
</tbody>
</table>

### What about Copyright?

Ivy Plus Libraries attempts to notify all organizations and/or website owners before crawling selected sites. Some websites may contain material that is produced by other parties who may claim copyright ownership of such materials.

## Geologic Field Trip Guidebooks

We will archive the online guidebooks cataloged in the Geologic Guidebooks of North America Database (GGNAD) that are not already preserved elsewhere. The web archive will be a full text archive that complements the GGNAD. The GGNAD consists of references to geologic field trip guidebooks of North America (United States, Canada, Mexico) from 1940 to the present and builds on collaboration between the Geoscience Information Society (GSIS) and AGI.

This project is currently in development and has been funded through the Ivy Plus Web Collecting Program.

### Thanks

Ivy Plus Libraries Web Resources Collection Program. Including: Samantha Abrams, Web Resources Collection Librarian

And the following collaborators:
- Jeremy Cusker (Cornell)
- Jane Quigley (Dartmouth)
- Brittney Wofford (Duke)
Citizen Science or Crowdsourcing is Exploring

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Princeton University
105 Peter B. Lewis Library
Princeton University
Princeton, NJ 08544

Citizen science or crowdsourcing is exploding. I would like to survey the scope of what is being done in the geosciences including geochemistry, geophysics, paleontology, mineralogy, sedimentology, seismology, volcanology, climate change, atmospheric studies, oceanography, biogeochemistry and carbon and nitrogen cycles.

Poster available online via GSA website:

https://gsa.confex.com/gsa/2018AM/webprogram/Paper323770.html
INCREASING OPEN EDUCATIONAL RESOURCES IN THE EARTH SCIENCES VIA EXAMINATION OF THE COPYRIGHT STATUS OF PUBLISHED WORKS

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ABSTRACT
Academic institutions are increasingly aware of the impact of the cost of textbooks and other educational resources on student retention and affordability of a college education. Many institutions have attempted to address this issue in part by purchasing e-books (textbooks) with unlimited access for students, however, many publishers do not support or make such licensing affordable. Another tactic is to create or join open educational initiatives, which focus on developing freely-available textbooks and other educational materials. These initiatives (e.g., MERLOT, MIT’s OpenCourseWare, Penn State’s Open.ED@PSU, UMinnesota’s Open Textbook Library to name just a few) rely largely on recently created content, made available by authors and institutions. A scan of open educational resource collections reveals a dearth of offerings in the earth sciences, however. It may be possible to address this scarcity by examining older works that still have value as teaching material. A common reason educators ignore these materials is the assumption that these resources are within copyright and thus not freely accessible. The general guideline is that works published in the United States after 1923 remain within copyright for 95 years.

Studies by Wilkin (2017) and others examining the copyright status of works believed to be in the public domain (i.e., less than 95 years old) have revealed that over 50% of works published in the U.S. between 1923 and 1963 are now in the public domain. These results offer hope that large numbers of works could be made available for educational use by simply checking the copyright status of the work. The HathiTrust is a digital library of over 16 million volumes, and a collaborative initiative of many libraries. One activity of the collaborative is the coordinated review of copyright status of works in the collection. Since its origins in 2008, over 600,000 works have undergone copyright review, with over 320,000 works being determined to be in the public domain. An additional review of the copyright status of works selected for inclusion in the earth sciences section of Books for College Libraries also found that over 50% were now in the public domain.
INTRODUCTION

An oft-quoted statistic is that student costs for textbooks average over $1200 per year (College Board). Facing fast increasing costs, initiatives are underway across academe to reduce textbook costs for students. One mechanism to deal with the problem is to increase the number of free educational resources available. Known as OER, open educational resources are educational materials that are in the public domain or available with an open license. There are several search engines and collections that facilitate identification of OER. These include:

- Directory of Open Access Books
- OASIS
- OpenStax
- MERLOT
- Open Textbook Library
- Open SUNY Textbooks
- Affordable Learning LOUISiana
- Open.ED@PSU
- BC Campus OpenEd
- MIT OpenCourseWare

A search of these collections reveal that few open textbooks exist in the earth sciences. It may be possible to address this scarcity by identifying older works that still have value for instruction that are now in the public domain. A general rule of thumb is that materials published in the U.S. after 1923 are still within copyright, however the U.S. rules of copyright are more nuanced than that. Until 1964, the law required that copyright owners renew their copyrights within a very specific window of time else the copyright would lapse. Based upon data from the HathiTrust’s Copyright Review Management System, a study by Wilkin reported that over 50% of U.S. works published from 1923 to 1963 were found to be in the public domain due to lack of proper copyright renewal.

METHODOLOGY

The current study examined the copyright status of geology monographs published between 1923 and 1963 that are part of the HathiTrust Digital Library (HDL). The HathiTrust Digital Library contains over 8 million monographic works from major academic collections across the United States. The Copyright Review Management System is a collaborative project by HathiTrust members to examine the copyright status of works within the HDL. While work is still ongoing, since 2008 over 600,000 works have been examined with over half being determined to be in the public domain (HathiTrust).

A search in the HathiTrust Digital Library for works classified as ‘geology’ published between 1923 and 1963 returned over 33,000 titles, with approximately 10,000 (30%) being in the public domain. This included monographs from all types of publishers, including government sources.
<table>
<thead>
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<th>Date published</th>
<th>Percent in public domain*</th>
</tr>
</thead>
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<td>1923-1929</td>
<td>33%</td>
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<tr>
<td>1930-1939</td>
<td>31%</td>
</tr>
<tr>
<td>1940-1949</td>
<td>42%</td>
</tr>
<tr>
<td>1950-1959</td>
<td>18%</td>
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*Since the project to review copyright status continues, it is possible that these percentages will change as more materials are reviewed.

The HathiTrust Digital Library includes books of all types, many of which would not be considered useful as a textbook so an additional method was used to try to estimate the number of potential textbooks now in the public domain. The copyright status of works on geology that were included in the 1967 edition of *Books for College Libraries* was examined. *Books for College Libraries* was a bibliography of core works for academic library collections, and included many textbooks. The Stanford Copyright Renewal Database was used to search for copyright renewal data. Of the 225 works on geology in *Books for College Libraries*, 109 (48%) had their copyright renewed leaving 116 (52%) now in the public domain.

CONCLUSION
The need for affordable educational materials is a serious issue for students. Repositories and collections such as the Open Textbook Library are good first stops when seeking OER, but the potential of older books to supplement new OER should not be overlooked. The results from examining the copyright status of books on geology in the HathiTrust Digital Library and in *Books for College Libraries* reveal that thousands of works published between 1923 and 1963 are currently in the public domain. These works can provide significant, valuable content for educators to use in their courses. The process to check copyright status is fairly straightforward and should be considered before rejecting the use of older works that are potentially in the public domain.

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Scientific Literature Uses in Geography:
Indexing and “Overlap” in Four Bibliographic Tools

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This research aims to evaluate the interest for geographers to use Google Scholar (GS) over the commercial databases Web of Science (WoS), Scopus (multidisciplinary databases), and GeoRef (specialized in geosciences).

To achieve our main objective, we performed searches in order to verify to which extent researchers' citations are covered by the search engine and the three commercial bibliographic databases mentioned. Our sample consists of the citations of three dissertations in Geography presented in the Uliège (Belgium) Department of Geography during the 2014-2015 academic year, respectively in Climatology, Tourism and Geomatics.

In order to have an overview of the results’ “overlap” for the bibliographic tools, and their "unique" contribution, Venn diagrams were constructed for each thesis.

The Venn diagrams indicate that GS finds almost all bibliographic references and returns the greatest number of "unique" results. The “overlap” rates between the commercial databases is very high and GeoRef stands out with very low results.

GS is an important and rich complementary tool, with a more varied panel of publishers, languages and countries of publication.
Beyond Spreadsheets – R Interface for Initial Analysis and Visualization of “Medium Data” From Environmental Monitoring Networks

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Earth system monitoring requires multiple sensors and frequent sampling in order to capture spatial and temporal complexities, easily generating hundreds of thousands of data points. Extracting insights from this data is limited by a lack of metadata and difficulty aggregating across data streams or time periods. The data volume size often exceeds spreadsheet capability but is below the threshold of current “big data” initiatives. We present an open-source cloud-based relational database coupled with an R based interface. The tool emphasizes a high level of user-control to facilitate consolidation of data from many different types of nodes, user-defined QA/QC filtering and summary statistics, and easy viewing and querying for the discovery of trends and events. Import/export in CSV is supported, facilitating detailed analysis of sub-sets outside the tool. The tool provides a variety of interactive, publication-quality graphics that can also be fine-tuned by the user. This project maintains an open-access ethos and budget. While developed in support of data management for the 100+ node "Cave Pearl Project" coastal aquifer critical zone observatory, the tool is adaptable to any research effort with data volumes in the hundreds of thousands or millions. Onsite demo will be provided.
Evaluating the Effects of Removing Proposal Submission Deadlines in NSF’s Division of Earth Sciences

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The National Science Foundation’s Division of Earth Sciences (EAR) supports research, education and infrastructure investments that advance scientific understanding of the Earth’s evolution, structure and the life it supports. Over the last several years, the National Science Foundation (NSF) has experienced rising proposal submission rates, resulting in increased stress on the merit review process and decreased success rates. Starting in 2011, a collection of pilot studies was implemented across the NSF, including one that removed proposal deadlines in EAR’s Instrumentation and Facilities program. As a consequence, proposal submissions to the program decreased significantly. In 2015, following on the initial pilot’s success of reducing proposal submission rates resulted in an expanded pilot that included several core science programs in EAR: Geobiology & Low-temperature Geochemistry, Hydrologic Sciences, Geomorphology & Land-use Dynamics and Sedimentary Geology & Paleobiology. Predicted effects of this expanded pilot included: (1) reduced proposal submission rate; (2) increased success rate; (3) reduced workload for the reviewer community; and (4) negligible changes in the demographics of submitting principal investigators. By accepting proposals at any time, investigators are provided more time to collaborate and prepare transformative scientific proposals while leveling administrative workloads associated with merit review. Proposal and principal investigator demographic data were collected and analyzed for the programs both before and after the deadline removal date. Data analyzed thus far are consistent with our predictions and as a result the remaining EAR disciplinary science programs have removed proposal submission deadlines as of summer 2017.
Part 2: GSIS Meeting Supplemental Materials

2018 Annual Meeting
Indianapolis, Indiana

November 4-7, 2018
2018 Geoscience Information Society Annual Meeting Schedule
November 3 - November 7, Indianapolis, Indiana

Saturday, Nov 3
9:00-4:00 Geosciences Librarianship 101
Indiana University-Purdue University Indianapolis

5:30-7:00 Early Bird No-Host Dinner
The Rathskeller, 401 E. Michigan St, Indianapolis, IN

Sunday, Nov 4
8:00-9:00 GSIS Executive Board Meeting
JW Marriott Indianapolis, Room 102

9:00-12:00 GSIS Business Meeting
JW Marriott Indianapolis, Room 102

12:00-1:30 GSIS Mentoring Lunch (open to formal or informal mentoring)
JW Marriott Indianapolis, Meet at Room 102

1:30-4:30 GSIS Field Trip: Indiana State Museum & Eiteljorg Museum
JW Marriott Indianapolis (meet at Main Lobby)

5:00-7:00 GSA Exhibit Opening Reception
Indiana Convention Center, Hall I

Monday, Nov 5
9:00-11:00 GSIS Walking Field Trip: Indiana State Library & Indianapolis Public Library
JW Marriott Indianapolis (meet at Main Lobby)

12:00-1:30 GSIS Luncheon & Publication Awards
JW Marriott Indianapolis, Room 102

3:00-5:00 GSIS Vendor Update/Information Resources Session
JW Marriott Indianapolis, Room 108

5:00-7:00 Friends of AGI Reception
JW Marriott Indianapolis, White River Ballroom Section A

Tuesday, Nov 6
9:00-6:30 GSIS Poster Session (T25) – Posters Available for Viewing
Geoscience Information Needs in Education and Research
Indiana Convention Center, Halls J-K

11:30-1:00 GSIS Common Read and Lunch
Quakeland: On the Road to America’s next Devastating Earthquake (K. Miles)
Meet at the GSIS posters in the Indiana Convention Center, Halls J-K
12:15-1:15 USGS Vision Presentation, James Reilly, USGS Director (also on Livestream via GSA) 
Indiana Convention Center, Sagamore Ballroom 5

1:00-3:30 GSIS Professional Issues Roundtable 
JW Marriott Indianapolis, White River Ballroom Section A

4:30-6:30 GSIS Poster Session (T25) - Presenters at Posters 
Geoscience Information Needs in Education and Research 
Indiana Convention Center, Halls J-K

7:00-9:00 Geoinformatics Division and Geoscience Information Society Joint Reception 
Presentation of the Mary B. Ansari Distinguished Service Award 
JW Marriott Indianapolis, Room 104

**Wednesday, Nov 7**
9:00-6:30 Geoinformatics Poster Session (D46) – Posters Available for Viewing 
Advances in Geoscience Data, Delivery, and Use - Geoinformatics 
Indiana Convention Center, Halls J-K

4:30-6:30 Geoinformatics Poster Session (D46) – Presenters at Posters 
Advances in Geoscience Data, Delivery, and Use - Geoinformatics 
Indiana Convention Center, Halls J-K

**Contact:**
Chris Badurek, Program Facilitator
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Geoscience Information Society 2018
Annual Business Meeting
Sunday, 4 November, 9:00 am-12:00 pm
JW Marriott Indianapolis, Room 102


1. Call to order
2. Welcome and general introductions (Bob Tolliver)
   Thank you to Chris Badurek and Cynthia Prosser for organizing meeting
   Thank you to Clara McLeod for organizing GL 101
   Thank you to new officers - Cynthia Prosser (vice-president) and Stephanie Earls (secretary)

3. Approval of agenda and approval of 2017 minutes
   One change needed to the 2017 minutes
   ACTION: Sam will change treasurer start date from November 1 to January 1.
   Agenda approved
   Minutes approved

4. Executive Board and Appointed Position Reports
   a. Past President report (Matt Hudson)
      i. Nominations - 61 votes cast; Stephanie Earls will be new Secretary and Cynthia Prosser will be vice-president
      ii. Auditor’s report - 2016 Audit completed by Patricia Yocum
           Notable items, both resolved - one time gift card and issues related to drinks from 2016 anniversary dinner
      iii. Documentation - most items will be saved in wiki, some to be sent to Anne Huber, archivist
   b. Vice president report (Chris Badurek)
      i. Chris organized meeting in Indianapolis
      ii. Sessions -

        Sunday, Nov 4
        8:00-9:00           GSIS Executive Board Meeting
        9:00-12:00          GSIS Business Meeting
        12:00-1:30          GSIS Mentoring Lunch (open to formal or informal mentoring)
        1:30-4:30           GSIS Field Trip: Indiana State Museum & Eiteljorg Museum
        5:00-7:00           GSA Exhibit Opening Reception

        Monday, Nov 5
        9:00-11:00          GSIS Walking Field Trip:
                             Indiana State Library & Indianapolis Public Library
        12:00-1:30          GSIS Luncheon & Publication Awards
        3:00-5:00           GSIS Vendor Update/Information Resources Session
director of AGU will be attending instead of Brooks Hansen

Tuesday, Nov 6
9:00-6:30   GSIS Poster Session (T25) – Geoscience Information Needs in Education and Research
11:30-1:00 GSIS Common Read and Lunch
Quakeland: On the Road to America’s next Devastating Earthquake (K. Miles)
1:00-3:30  GSIS Professional Issues Roundtable
4:30-6:30  GSIS Poster Session (T25) - Presenters at Posters
Geoscience Information Needs in Education and Research
7:00-9:00  Geoinformatics Division and Geoscience Information Society Joint Reception
Presentation of the Mary B. Ansari Distinguished Service Award

Sponsors - AGI, AGU, GSA, GSW, GSL

c. **Treasurer report** (Bridget Thrasher)
   Awards distributed to GL 101 Instructors and Poster presenters

d. **Secretary** (Samantha Teplitzky)
   90 personal members
   379 geonet subscribers, 1 out of 4 subscribers are GSIS members

   Affiliation breakdown:
   49% (44) academic
   19% (17) retired
   10% (9) government
   10% (9) publishers/AGI
   6% (6) oil/mining/energy corporations
   4% (4) other - students, etc.

   18 members lapsed
   About 22 new members since 2017 (some are lapsed members rejoining)

   Thoughts:
   Gaining new members is important, but it is more important to welcome, incorporate and include them in the organization.

e. **Geonet** (Louise Deis) - Louise will turn Geonet over to Emily this year
   379 current subscribers
   ACTION: Emily will update settings to change automatic reply all feature.

f. **Topical Session Convener** (Cynthia Prosser)
   2018 Poster session (Tuesday, 4:30-6:30) will have 21 posters - geoscience information needs in education and research
   There were not enough oral abstracts to support oral session
The “common read” will meet at 11:30 on Tuesday - Quakeland by Catherine Mills

g. Webmaster report (Bob on behalf of Courtney Hoffner)
Courtney’s job has changed and she is stepping down as webmaster. We will need to fill this position. Interested members should get in touch with Bob.

h. Geoscience Librarianship 101 (Clara McLeod)
i. IUPUI University Library hosted by Eddy Gonzalez (attended previous 101).
ii. Attendees:
   28 registrants and 26 attendees
   4 members of our society (Bob, Chris, Louise, Shaun)
   9 graduate students (membership will be supported by anonymous donor)
   24 evaluation forms were completed but not yet reviewed
   Note: this is the first time we have needed insurance at venue

i. Newsletter report (Amanda Bielskas and Michael Noga)
i. Successful year - Michael handles content, Amanda, layout
ii. Always looking for contributors - consider contributing for slower, winter issues

j. Proceedings - Chris has created proceedings, will be sent to Rusty to upload and publish this month.

5. Committee Reports
a. Archives (Anne Huber) - no report

b. Membership (Clara McLeod) -
   i. limited activity this year
   ii. membership form updated and included in GL101 folders

c. Guidebooks (Bob on behalf of Linda Musser)
i. continues to gather information on new guidebooks to share with georef
ii. list of recently published guidebooks to be included in December newsletter
iii. guidelines document updated
iv. proposal written for guidebooks web archive (ivy plus libraries) - amanda will present related poster in poster session
v. solicited nominations for guidebooks award
vi. Award recipients:
   4. OUTSTANDING GEOLOGICAL FIELD TRIP GUIDEBOOK SERIES: New England Intercollegiate Geological Conference

GSIS Proceedings, Volume 46, 2018
d. **Exhibits** (Linda Zellmer)
   i. Content/layout from IFLA poster on how to spot fake news has been adapted to how to spot fake science

e. **Awards**
   i. **Distinguished Service Award** (Louise Deis)
      1. This year’s Distinguished Service Awardee is Linda Musser
   ii. **Best Research Resource Award** (Amanda on behalf of Rusty Kimball)
   iii. **Best Paper Award** (Bob on behalf of Kay Johnson)

**Break**

**Discussion #1: GSIS Website**

*Update:*
We are in the process of recruiting new webmaster(s). The position will be responsible for updates, but should also be able to take on website redesign in some form. A suggestion was made to split technical and content responsibilities between two people.

*Features:*
We discussed past suggestions of adding discussion forum or other interactive features, and the suggestion was made to consider service like Wild Apricot which allows for membership features, polls, and surveys.

*Content:*
Discussion moved to what content should be included on the website, including Geoscience Librarianship 101 materials, job search and career advice, but members’ limited bandwidth for frequent updates and the need to maintain basic serviceability were also mentioned.

*Process:*
We will need to set up process to approve new design, but first we need members willing to serve as webmaster(s).

**ACTION:** Form task force to handle web redesign and support webmaster (C. Badurek)

**Discussion #2: Membership**

*attracting, welcoming, and retaining members.*

**Travel Scholarship:** Brittney Wofford (Duke) is the first recipient of GSIS Travel Scholarship.

Other recruitment efforts have met with limited success, including local recruitment ahead of meeting

**Suggestions:**
Emphasize that our focus is not just geology and better explain of scope of our group.
Consider meeting with or alternating with AGU which many of our faculty attend.
Consider the organization of a “pan” physical sciences group meeting, maybe hosted at AGU
Some will attend AGU in DC this year.

Retention:
What to do beyond an initial welcome?
The president sends a welcome letter, but we should consider more ways of connecting with people throughout the year to encourage them to keep membership.

COST of meeting:
Could we compress schedule and hold more events on Sunday?
Can advertise that attendees can generally attend hotel events for free?
We issue exhibit passes for 101 attendees - could they be handed out ahead of time?

Discussion #3: Scholarly Communications Committee. Should we form one?
To be discussed at professional issues roundtable.
Perhaps we can organize a focused session at the next meeting.

Discussion #4: Online Courses/tutorial. GL101 material? Other topics?
Recommendations - consider offering webinars through GPO
ACTION - Plan to host two webinars, one webinar through GPO (Emily) and one through ALA-STS (call from STS went out Oct 1 on STS-L for "Information literacy instruction and outreach in STEM")
Evaluate experiences next year
GSIS could also co-host vendor presentations

Any Other Business
GSIS rep to GSA Publications committee - (Lisa Dunn)
discussion of evolution of open access in geoscience

Passing of gavel
Call to adjourn
Event Photos
from the
Annual Meeting
Indianapolis
2018

Shaun Hardy
Publicity Officer
“Geoscience Librarianship 101” brought together 35 librarians and students for a day of learning and networking with GSIS members at the IUPUI University Library on November 3.

Members “catching up” at the annual Business Meeting as Bob Tolliver presides.
Bob Tolliver passes the gavel to incoming president Chris Badurek at the close of the Business Meeting.

2019 GSIS Executive Board: (from left) Stephanie Earls, Chris Badurek, Bridget Thrasher, Bob Tolliver, Michael Noga, Amanda Bielskas, Cynthia Prosser.
Information literacy and fake science were the themes of this year’s GSIS exhibit, designed by Linda Zellmer.

Members mingle at the GSIS booth in the exhibit hall.
Members welcome first-time attendee Brittany Wofford at the GSIS Mentoring Lunch.

GSIS field trip to the Indiana State Library.
The stunning Indianapolis Public Library

The “cast” of GL101 take a bow at the GSIS Luncheon for another successful year of presenting our popular professional development seminar. (from left): Sam Teplitzky, Amanda Bielkas, Linda Zellmer, Emily Wild, Clara McLeod, Mary Ellen Vedas, Stephanie Earls.
Chris Badurek presents the Best Guidebook Award to Martin Meschede (University of Greifswald) for *Field Guide to the Geology of Northeastern Oman* (Borntraeger Science Publishers, 2016).

Honors for the Best Guidebook (Popular Category) went to *Roadside Geology of Nevada* (Mountain Press, 2017). Publisher John Rimel accepted the award from Linda Musser.

Sara Mana (Salem State University) thanks Linda Musser and the Guidebooks Committee for honoring the New England Intercollegiate Geological Conference with the Outstanding Guidebook Series Award.
Tip Meckel (Texas Bureau of Economic Geology) accepts the Mary B. Ansari Best Research Resource Award from Amanda Bielskas for *Salt Tectonics – Principles and Practice* (Cambridge, 2017).

Bob Tolliver congratulates Samantha Teplitzky on receiving the 2018 Best Paper Award.

Shaun Hardy presents a certificate of recognition to Brittany Wofford on receiving the 2018 GSIS Travel Grant.
Neal Marriott (Geological Society of London), Marc Segers (GeoScienceWorld), and Sharon Tahirkheli (AGI/GeoRef) presented updates at the Vendor/Information Resources Forum.

Information Resources Forum convener Chris Badurek listens as AGU Executive Director Christine McEntee briefs attendees on AGU’s centennial initiatives and new publications.
Linda Musser accepts the Mary B. Ansari Distinguished Service Award from Louise Deis at the GSIS/Geoinformatics Division Joint Reception.

In good company!
Past recipients of the Ansari Distinguished Service Award: Sharon Tahirkheli, Michael Noga, Linda Zellmer, Shaun Hardy congratulate this year’s winner, Linda Musser.
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