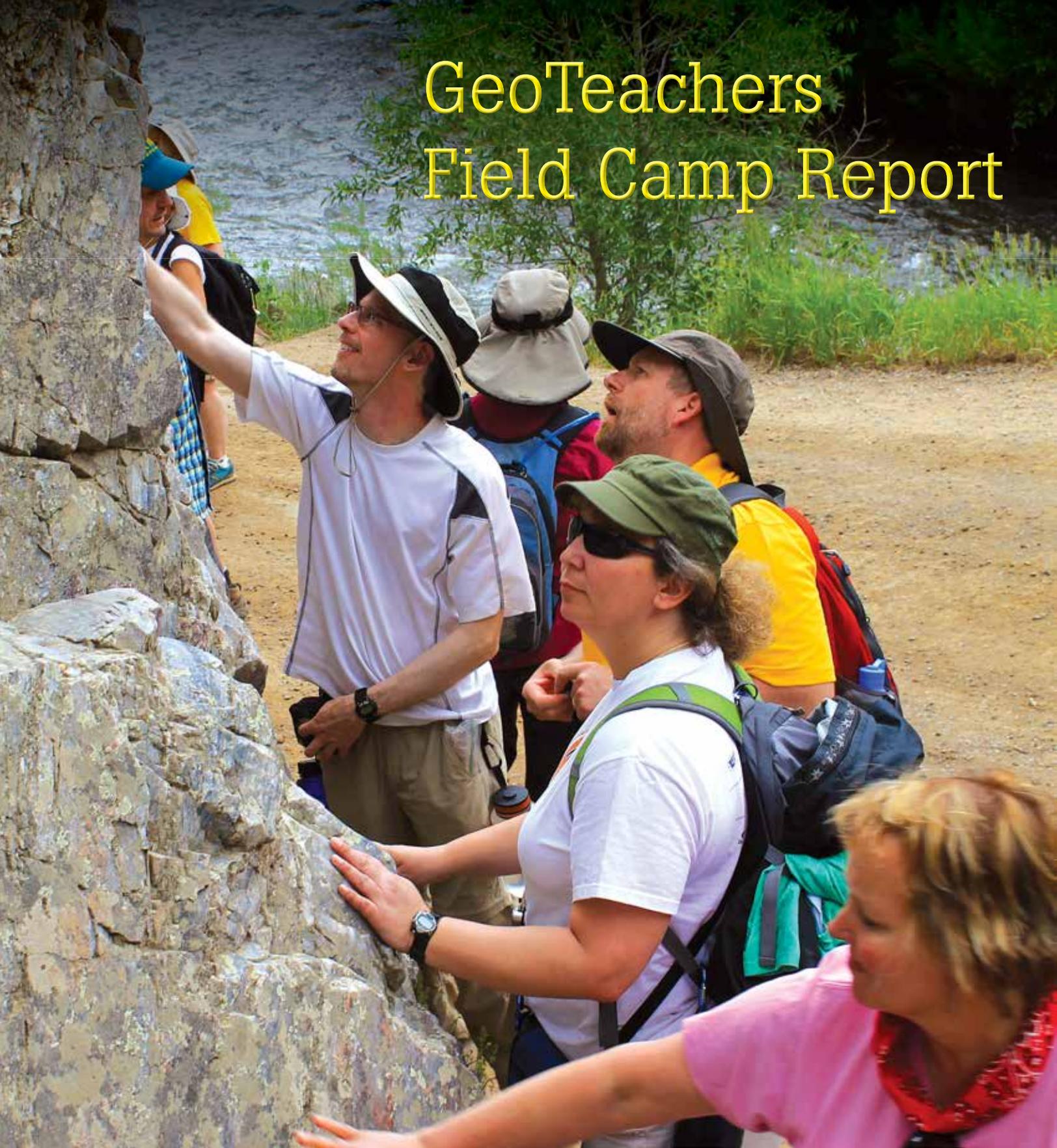


# GeoTeachers Field Camp Report



2013–2016

 THE GEOLOGICAL SOCIETY  
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# 1. An Introduction to GeoTeachers Field Camps

More than half of K-12 Earth science teachers have little to no formal background in the geosciences. In fact, only 39% of high school earth-science teachers are certified to teach earth science<sup>1</sup>, and the numbers are even lower for middle and elementary-school teachers. Even fewer have studied geology out in the field. As a result, many teachers lack the confidence and necessary skills to teach engaging and relevant earth science classes. The need to provide quality professional development for teachers that integrates content, pedagogy, and field experiences is great.

GeoTeachers Field Camps were established in 2013 to meet these needs by exposing K-12 earth-science teachers to basic field principles, increasing their geologic content, introducing teachers to various regional geologic locations, and demonstrating best practices for teaching geoscience topics in the classroom. As a result, teachers who attend the Field Camps indicate that they learn new approaches to teaching the geosciences, gain a deeper understanding of the concepts and are more confident and excited to teach earth science.

## 2. The GeoTeachers Field Camps' Mission

- GeoTeachers Field Camps are five- to six-day camps that take place in various parts of the country. The Field Camps aim to:
- Provide teachers with the opportunity to study geology in a field setting in order to increase content knowledge and to clarify misconceptions;
- When applicable, allow teachers to collect rock, mineral and fossil samples for their classrooms which they are often unable to afford on their own;
- Give teachers the chance to practice such skills as mapping, and data collection;
- Create an atmosphere for teachers to share best practices and to discuss ways to incorporate field studies and inquiry methods in their classes;
- Offer the chance for teachers to learn about regional geology; and
- Keep costs affordable.



Teachers from the 2014 Rocky Mountain Field Camp learning about xenoliths and hydrothermally altered granite.

<sup>1</sup>State Indicator for Science and Mathematics Education 2005



Teacher from 2013 Rocky Mountain Field Camp measuring dinosaur footprints.



Teachers trying to determine the geologic events that allowed the Florissant Fossils to form.



Teachers from the 2013 Rocky Mountain Field Camp examining the Coal Creek Quartzite.



Examining the tilted layers at Skyline Drive.

### 3. Field Camp Descriptions

#### Rocky Mountain Field Camp (RMFC)

The Rocky Mountain Field Camp was the first K-12 GeoTeachers Field Camp established for K-12 teachers. This five-day course takes teachers to numerous sites around Central Colorado and has operated in 2013, 2014, and 2016.

At each stop, teachers are expected to draw observations from a rock outcrop. From these observations, they must make deductions about the geologic story of the outcrop. This is a very difficult task for most teachers, and they struggle with it at the beginning of the week. As the week progresses, they become more confident in making observations and using what they already know to make appropriate deductions. Teachers who have little background in the geosciences say that they feel as if they learned much more through this method of teaching because they learn multiple aspects of geology at once. For example, many of our stops examine sedimentary rocks. Teachers aren't just identifying the rocks; they are also analyzing the characteristics to determine the past environments that formed them. They learn to look for features such as ripple marks and begin to ask themselves where these features form today. They are then able to determine the history on their own instead of having someone give them the answer. This exercise allows for connections to be made in a natural setting and it permits teachers to use higher-order thinking skills. Furthermore, teachers comment on their camp evaluations that this teaching method enhances their own teaching skills. They have a chance to experience it themselves prior to implementing it in their classrooms.

The Rocky Mountain Field Camp allows for numerous samples to be collected. Teachers indicate that they are able to enhance their classes by using rock, mineral, and fossil samples that they themselves collected. As one teacher put it:

*"Trips like this add credibility in the eyes of my students. I am seen to be more knowledgeable ... because I've done this." ~comment from evaluations*

Without a doubt, unexpected learning opportunities occur in the field to provide teachable moments. During a stop on the 2013 RMFC, teachers ran into Adam Jackson, a Ph.D. candidate from University of Kansas and GSA member. He was conducting research on trace fossils when our group arrived at Skyline Drive in Cañon City, Colorado. Recognizing that our group was there to learn about fossils, he introduced himself and provided an impromptu mini-lesson for the teachers. He took time out of his day to discuss his research, provide general background information on trace fossils and explain the importance of trace fossils. He enjoyed interacting with the teachers so much that he asked if he could lead another discussion for the 2014 Field Camp. Trace fossils get little recognition and he made them come alive for these teachers and their understanding increased dramatically.

Numerous agencies and organizations contribute to the success of the RMFC. The Bureau of Land Management, the National Park Service, Henderson Mine, Colorado State Parks and National Oceanic and Atmospheric Administration participate in the Field Camp each summer.

## Mammoth Cave Field Camp (MCFC)

The Mammoth Cave Field Camp, which ran in 2014, was the second Field Camp developed for teachers. It was developed in partnership with the Mammoth Cave National Park Education Center, the Mammoth Cave International Science and Learning Center, and Western Kentucky University. These partnerships were extremely beneficial and added significant value to the Field Camp. As a result, teachers were able to explore parts of Mammoth Cave that are only available to research scientists as well as nearby caves that are completely closed to the public.

In addition to exploring the caves, the teachers mapped the cave floors and related cave features to the surface above them. They participated in water discharge research and biodiversity research projects, and they were able to conduct a water dye trace test. Finally, teachers were able to use equipment that helped them locate and count bats.

The Mammoth Cave National Park Education Center provided excellent classroom activities for the teachers to use as well as many field activities that could be easily adapted for the classroom. One such activity had teachers measuring stalagmites and stalactites to calculate an estimated age. Teachers loved this activity, and many planned on creating papier-mâché stalagmites and stalactites for their classrooms.

Discussions throughout the week included how to adapt field experiences for the classroom, comparing the karst environment in Kentucky to the karst environments in their home states (particularly Florida) and the numerous ways in which humans and Earth impact each other.

Feedback from teachers was overwhelmingly positive. Teachers indicated in evaluations that they would be able to use the information and activities learned during the field camp in their classrooms.. Teachers have since emailed the trip leader, noting that they are using the activities in their karst unit as well as different units throughout the year.

*“I love the idea that the data we collected will be used in a real study. Loved seeing parts of Mammoth Cave that only researchers see.” ~comment from evaluations*

*“I love the fact that we are learning and doing a skill used in the field (water dye test). Great activity- can’t wait to do the interpretation on Friday.” ~comment from evaluations*



Mammoth Cave participant practicing using an inclinometer in order to conduct a mapping exercise.



Mammoth Cave participant exploring parts of the cave closed to the public.



Mammoth Cave teachers gathering data for a water discharge research project.



Happy teachers getting ready to learn about the geology above ground during the Mammoth Cave Field Camp.



Lighthouses in Maine are not only beautiful, but they stand on amazing geology. Portland Head Light.



Star Arch. Teachers learn about the rocky coasts in Maine and the conditions that are needed to form them.



Blueberry Beach is an excellent site to practice making a beach transect.



Sand Beach is unusual in Maine due to the sand and shell composition. It is also a great spot to study the rare shatter zone.



Schodic Point is the perfect spot to study offset faults, diabase dikes, crosscutting relationships and much, much more!

## Acadia Field Camp (AFC)

The Acadia Field Camp, the third field camp in the GeoTeachers program, is new for 2016. Working in partnership with the Schoodic Institute at Acadia National Park and local professional geologists, teachers will have the opportunity to explore how the eastern coast of the United States formed. They will spend an entire day mapping the dikes at Schoodic Point, learn how glaciers shaped the topography of the northeast, create a beach profile, keep a field notebook, and interpret the geologic history of Maine and the northeast. Additionally, teachers will learn about the history of granite mining and the many uses granite has during their tour of the Hall Quarry. While at the quarry, they will witness a granite splitting demonstration prior to splitting their own piece of granite.

When semi-retired, professional geologists Duane and Ruth Braun heard about the Acadia Field Camp, they reached out to the trip leader and asked if they could join the trip for a day. They are two of the leading experts on Mount Desert Island having spent several decades researching the island. Teachers will benefit greatly by this partnership, because they will learn about the most recent research being conducted on the island.

Local Portland geologist, Denise Bluhm, will co-lead the trip. Denise is a GSA member who leads multiple geology hikes for local residents. Her knowledge of Maine geology is considerable and she has developed a skill for teaching complex geoscience topics to the layperson. Furthermore, she will take teachers to sites with incredible geology rarely seen elsewhere in the United States.

## Field Camps Comparison

FIELD CAMP	Rocky Mountain	Mammoth Cave	Acadia
<b>YEARS</b>	<b>2013, 2014, 2016</b>	<b>2014</b>	<b>2016</b>
<b>TOPICS</b>	<ol style="list-style-type: none"> <li>1. Geologic Interpretation</li> <li>2. Rocks and Minerals</li> <li>3. Fossils</li> <li>4. Geologic History of Colorado and the Rocky Mountains</li> <li>5. Relative Dating</li> <li>6. Mid-Continental Rifting</li> <li>7. Determining Past Environments Based on Rock Characteristics</li> <li>8. Weathering and Erosion</li> <li>9. Mining (2013-2014)</li> <li>10. How to Use Data from NOAA Resources (2016)</li> </ol>	<ol style="list-style-type: none"> <li>1. Karst Topography &amp; Formation</li> <li>2. Mammoth Cave Regional Geology</li> <li>3. Human Impact on Karst Environments &amp; Karst Impact on Humans</li> <li>4. Groundwater</li> <li>5. Mapping</li> <li>6. Measuring Stalagmites</li> <li>7. Conducting Research</li> <li>8. Water Dye Trace</li> <li>9. Sedimentary Rocks</li> </ol>	<ol style="list-style-type: none"> <li>1. Bedrock geology</li> <li>2. Rocks and minerals</li> <li>3. Glaciers</li> <li>4. Coastal processes</li> <li>5. Mapping (teachers will map the dikes on Schoodic Point)</li> <li>6. Relative dating</li> <li>7. Geologic history of East Coast (in particular Maine and Acadia)</li> </ol>
<b>SKILLS</b>	<ol style="list-style-type: none"> <li>1. Keeping a geologic field notebook</li> <li>2. Making observations and inferences</li> <li>3. Rock identification</li> </ol>	<ol style="list-style-type: none"> <li>1. Mapping</li> <li>2. Water Dye Trace Test</li> <li>3. Collecting Research Data</li> </ol>	<ol style="list-style-type: none"> <li>1. Strike and dip</li> <li>2. Mapping</li> <li>3. Keeping a field notebook</li> <li>4. Making observations and inferences</li> <li>5. Rock and mineral identification</li> </ol>

## 4. Geoteachers Field Camps Participant Demographics

### Who Are the GeoTeachers Participants?

#### Demographics

While the primary focus is to have middle- and high- school teachers with little to no earth- science background attend the Field Camps, elementary teachers, pre-service teachers, and community college tutors also attended.

Additionally, several teachers did not teach earth science. As states begin to adopt and implement the Next Generation Science Standards, more of these teachers are recognizing the importance of having a background in the geosciences. They are expected to incorporate geoscience topics in their classrooms, and they are choosing to attend a field camp to learn the content and best practices for teaching the content.

#### Geoscience Background

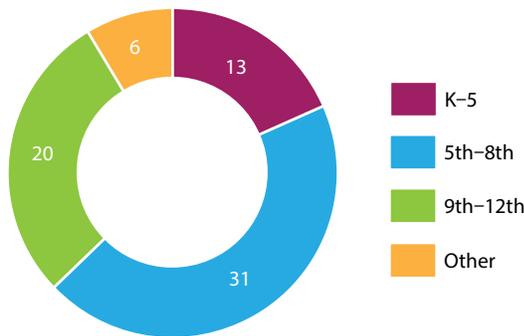
Only 22% of Field Camp participants had a degree (B.S., B.A., or M.S.) or a certificate in the geosciences. The primary audience for the Field Camps is teachers who have little to no earth-science background. This confirms that we are reaching our target audience. It is great to have teachers on the trips who do have a geoscience background because they often serve as unofficial mentors to the other teachers.

One of the best examples is a participant from the Mammoth Cave Field Camp. He was a past GeoCorps participant majoring in geology and lucky enough to work at Fossil Butte National Monument for two summers in a row. As a result of his work for the Monument, he decided to become a high school earth-science teacher. The summer before he began to teach, he registered for the Mammoth Cave Field Camp. Because of his previous experience, he had become an expert at spotting fossils. Other teachers watched him as he found fossils, and each time he found one, he would answer the teachers' questions. Because he was a participant on the trip, teachers were very comfortable with asking him questions that they may not have asked a trip leader simply because they viewed him as an equal. In return, the teachers were able to help him prepare for his upcoming first year of teaching. In his evaluation, he said it was incredibly valuable to learn pedagogy from veteran teachers. These symbiotic relationships that develop organically add significant value for all teachers involved.

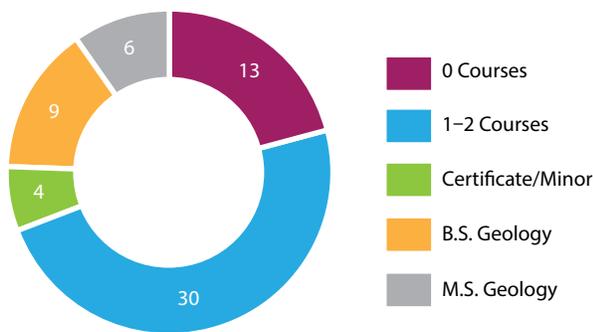
#### Gender

Approximately 74% of Field Camp participants are female. This matches the U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, "Public School Teacher Data File," 2011- 2013, which found that 76.3% of all teachers are women; however, women teachers make up only 44%-65% of middle school math and science faculty, depending on the subject and grade taught. There is currently a lack of women in STEM fields, and evidence suggests that the earlier girls are exposed to women role models in math and science classes (i.e., before college), the higher the number of girls who study math or science in college- (Barshay, 2015).

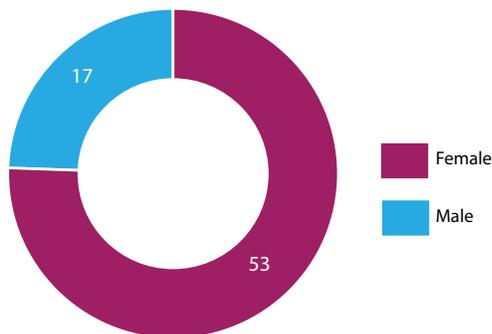
#### Grade Level



#### Geoscience Education Level



#### Gender

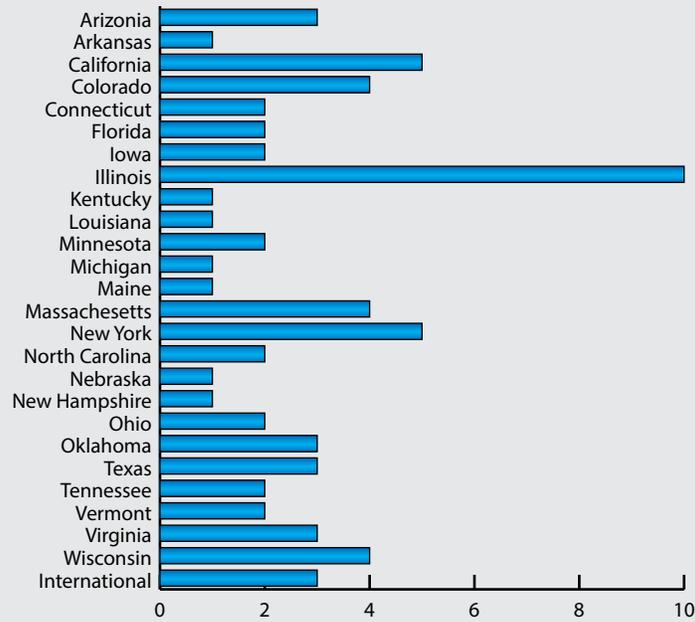


\*Other includes pre-service teachers, community college tutors, and teachers teaching other subjects (i.e. chemistry, environmental science, special education, English as a Second Language)

## Geographic Location

Teachers from 26 states and one other country (India) have participated in the GeoTeachers Field Camp Program. The Field Camp Program is intended to serve teachers from across the United States and this graph demonstrates that this goal is being met.

### Geographic Location



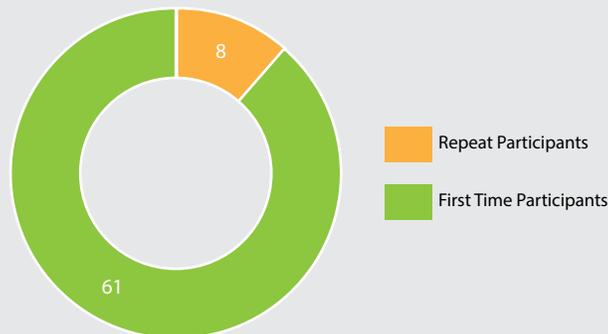
## 5. The Value of Field Camps

### Participants who have attended more than one Field Camp

As more Field Camp locations are added, more teachers are returning to participate in additional Field Camps. Teachers indicate that they return to participate in new Field Camps because they find that the Field Camps are valuable professional development opportunities. The content knowledge that they gain and the activities that they can use in the classroom help them immensely.

*"I am attending the Acadia Field Camp because I enjoyed the Mammoth Cave Field Camp and I have used much of the karst information that I gained from that Field Camp."*  
—Cindy Flemming, Mammoth Cave Field Camp and 2016 Acadia Field Camp Participant

### 2014–2016 RepeatParticipants



\*Further data needs to be collected to determine why Illinois is represented so well.



Participant Kathy Megivern examining the rocks at Chalk Cliff at the base of Mt Princeton.

## GeoTeachers Field Camp Success Stories

### *Rocky Mountain Field Camp, 2013*

*by Kathy Megivern*

The descriptions and itinerary for the Rocky Mountain Field Camp (RMFC) sprouted hopeful images and expectations in my mind. Several items especially captured my attention and placed the course at the top of my summer must-do list.

The pace of the course was all I'd hoped. I need the schedules for my too-infrequent trips to Colorado to be absolutely packed. And what a great start to this course! As soon as the last participant arrived, the leaders whisked us off to GSA Headquarters for a program and dinner. We arrived to tables set with rock samples and GSA tote bags of folders full of learning materials and a field journal. We began with lessons on the rock cycle and rock types.

In light of the nationwide drive for increased inquiry and relevance in science classes, some high school geology teachers avoid including rock identification in their courses. I've asked university professors and science education specialists at other workshops what research shows is the best approach regarding the teaching of rock identification, but it seems there is not yet a definitive answer. Feeling it is important, I've been teaching it with as much inquiry and relevance as I can. RMFC's rock cycle activity and subsequent series of rock identification activities provided answers that made sense to me, even though I hadn't yet asked the "best approach" question here. There was inquiry in this set of activities. And step by step, students would be well prepared for actual rock identifications at the end of the sequence. In addition, the lessons included ties to plate tectonics, environments of formation, geologic time, and the relevance of geology. This lesson helped me validate what I've been doing and added elements and timing for an even more meaningful experience for students. These quality activities were typical of those we experienced throughout this course.

The next morning, we continued our rock lessons outdoors and set out on the trails of Boulder to put our rock knowledge to use. At selected locations, we observed the rocks and recorded our observations in words and sketches in our field journals, interpreted the evidence in the rocks, then shared and discussed our observations and interpretations. Continuing this process from site to site, we pieced together the geologic history of this area. As we worked our way through the various ages of rock, Davida, The Geological Society of America Teacher Advocate Program Officer and our main trip leader, called this our "walk into the future."

With each new piece of the story added, Davida would remind us of what we had already determined and then build on it. I'd never experienced the power of review and reinforcement as dramatically as I did here. Most teachers have limited time outdoors, so field geology tends to challenge us. We experienced what many students experience when they face challenges in their learning, whether it is in the field, in the lab, or when faced with the written word. Sure, we could look in our notes to review, but the quick verbal repetition was welcome and effective and an excellent reminder for us as teachers.

## Rocky Mountain Field Camp 2014

by Sara Bostelman and Vanessa Buus,  
grant recipients

It was the Spring of 2013, when we were approached by the Golden Vertex Mining Corporation to make a wish list. A wish list that included anything and everything we as teachers could possibly want to increase the interest and involvement of our students in the Earth and Environmental Sciences. As may be the case for many teachers across the country at a time where school programs are underfunded, having someone you only just met come into your classroom and tell you to 'make a list' and that 'money was no object' was somewhat intimidating and surreal! Nobody gets to spend whatever they want on classroom supplies. So, we got to work anyways and presented our lists to the company. Little did we know what else was in store for us on this new adventure.

All of these efforts were part of the idea, or the gauntlet rather, that Golden Vertex CEO, Dick Whittington laid down for us as part of his goal to have someone from Mohave High School go through our program, graduate and attend a university to major in Mining Engineering, and eventually come back to Bullhead City and run the Moss Mine. By the Fall of 2013, the idea for the Golden Vertex Center for Earth Science Studies was born. This was to be a center solely for the study of the geosciences, where students had computer lab space for research, as well as lab space for stream tables, and room to study core samples and other rock and mineral specimens from the region.

At this point in the year, we had found out about the Rocky Mountain Field Trip for teachers put on by the Geological Society of America. This proved to be a great opportunity to learn about how to effectively integrate mining education and fundamental geologic processes into our classrooms. Little did we know what adventures Davida Buehler had laid out for us! One unique part of the camp was being able to exchange rock and mineral specimens with fellow field camp attendees from various regions. Golden Vertex, thankfully, allowed us to take some quartz monzonite and fluorite specimens from their property to share.

Field camp highlights for us included: visiting Garden of the Gods, stopping at Red Rocks Amphitheatre, fossil hunting at the Florissant Fossil Quarry and visiting the Florissant National Monument, Bigfoot sightings at Pike's Peak, measuring the stride of an Apatosaurus, and deciphering other trace fossils. Throughout the field experience, we analyzed available outcroppings and took field notes which we have been able to incorporate into creating more well-rounded field experiences and lesson plans for our own students. Getting to experience the geology of Colorado with other educators from various grade levels was truly one of the best learning experiences we could have asked for. It allowed us to collaborate about different strategies that either had or had not worked well in other classrooms. If you ever get the opportunity to go on one of these field camps that GSA offers, please do! You won't regret it!



Participants Vanessa and Sarah splitting shale in hopes of discovering fossils at Florissant Fossil Beds Quarry.



Participant Briana Brown measuring a stalagmite in order to calculate a rough estimate for its age.

## *Mammoth Cave Field Camp*

*by Briana Brown*

I first heard about the educational programs of the GSA when I walked into a workshop in progress at a National Science Teachers Association conference in Boston. As an offhand comment at one point, the presenters mentioned summer field camps for teachers. A week or so later when processing all the info I had gathered during conference I came across a little note in the margin to check out the GSA website. I saw field camps in the Rocky Mountains, and Mammoth Caves. I thought the Mammoth Caves looked awesome. I am ashamed to admit, I had no idea that such an extensive cave system existed in our country. A big motivation for taking part in a GSA field camp was a lack of knowledge about geology and geological history. Since starting to teach AP Environmental Science in 2010, I have been feeling that my knowledge of earth science is woefully inadequate. My undergraduate degree in Environmental Science, completed a decade previously, did not include any basic earth science or geology courses. While geology is a small part of the AP curriculum, it's a fascinating one and I felt that I was not doing it justice for my students.

So in July of 2014 I headed down to Kentucky for a week of cave exploration. The caves were even more amazing in person of course and the trip itself was a great way to experience them. The trip leader, Davida Buehler, put together a great itinerary with interesting speakers. On our arrival day Cheryl Messenger, a ranger of the National Parks Service (NPS), gave us a helpful overview talk about the cave system after we had settled from traveling. Our first full day we were joined by Chris Groves, a professor of geology at Western Kentucky University. We toured the region around Mammoth Caves and learned about the rock formations and how the composition changed over geologic time. This gave us some good context for learning about the formation of the caves themselves. Chris also spent the next day with us. He first brought us to an overlook area so that we could see what a karst landscape looks like. This was really helpful for me. I like getting the “big picture”. A karst landscape is shaped by the permeabilities of different rock types and results in a characteristic “rolling hills” topography from sinkholes of dissolved limestone next to rocks with impermeable caps still in place. After getting a peek at the “big picture” and learning how a karst landscape forms, we went into a cave that was part of that landscape we viewed from above to tie in everything we had learned. Then we were ready for the big time; we headed into Mammoth Caves through the historic entrance.

I had such a great experience with my first GSA field camp that I've signed up for another one. I am looking forward to my field camp this summer in Acadia National Park and the coast of Maine. I'm excited to learn more about how the coastline of New England has been shaped over time and I'm hoping to incorporate some of our local New England geology into my environmental science course in the next year.

## Rocky Mountain Field Camp 2016

by Diane Evans, Deanne Maschmeyer, and Marcie Look

The questions were building all day and many were answered along the way; however, so much came together at Garden of the Gods. I loved every minute! I've taught fossils as part of my dinosaur unit for years, always using fossils that were purchased. Today was a dream come true, being able to split shale and discover my own fossil. It was my science teacher dream come true...until tomorrow when I see dinosaur tracks!  
— Diane Evans

I loved Florissant so much! Ranger Whitney was a fabulous tour guide. I am totally impressed with your time management skills and the way you have planned such an enriching experience. All of us loved the fossil hunting. Road cuts will always be something that I look at with interest from now on. I was stoked to see the footprints and the pegmatite. The view of Royal Gorge was amazing, and I loved being able to stop along the road to collect rocks and minerals for my classroom. And I loved driving on the hogback! What an experience!  
— Deanne Maschmeyer

Each day builds on the previous day and Colorado's geologic story makes more sense with each passing day. I like mentally filling in the timeline, too, and I look forward to completing it as a group later in the week. I loved the lesson on igneous rocks. I learned a lot and it solidified a lot. I look forward to doing your described activities with my students. You and Ranger Whitney worked well together and we all enjoyed looking for fossils in the shale.  
— Marcie Look

## Acadia Field Camp 2016

by Mary Yulo

Although I have a science background, I was concerned about this trip because I've never taken a geology course. My husband said I'd learn a lot and he was right! This was an extraordinary learning experience! Davida's leadership style was perfect given the number of obstacles she faced (lost luggage, flight delays for 24 hours, etc.)! She had a clear plan and vision, and despite the fact that we couldn't access any of the course materials (geology equipment, field notebooks, handouts, etc.) she had a clear goal for each field stop along the way. I was able to take notes on my iPhone in the field (while taking lots of pics!). She arranged for great field experts who had both expertise and passion. The field assistant, Denise, had the perfect expertise to complement Davida's "inquiry approach." I learned so much that when I finally got my first geology book, I was familiar with much of the vocabulary and many of the concepts! The accommodations were right for the trip: rustic living sandwiched between hotels with hot showers and air conditioning in Brunswick. I absolutely loved the meals together, group cohesiveness, learning experiences, temperament of leaders (so calm!), expertise of leaders, expertise of guest presenters, optional experiences, opportunities to buy books and materials, occasional "down time," especially in Bar Harbor, final rock collection at Bar Harbor for samples, and great food. It was an outstanding trip overall! I cannot say enough about the planning and prep that the leaders did prior to the field experience! I've led many field trips in 30 years of teaching. Davida is an expert geologist, teacher, and trip leader. Kudos for a job very well done! I'm now a junior geologist! Thank you for an amazing and unforgettable week of fun and learning!



Participants Diane and Deanne standing in front of fossilized tree trunks at Florissant Fossil Beds National Monument



Participant Marcie Look observing a piece of the Fountain Formation and trying to find clues that would help her to determine the geologic past



Participant Mary Yulo enjoying her time tide pooling.

## College Credit and Professional Development Hours

In 2013, the GeoTeachers Field Camps partnered with the Colorado School of Mines in order for teachers to earn graduate credit. Four teachers took advantage of this opportunity. Credit was offered again in 2014 for both the Rocky Mountain and Mammoth Cave Field Camps; however, teachers did not take advantage of this even though many had asked.

In addition, teachers can earn up to 50 hours of professional development hours that count toward their recertification. All teachers take advantage of this.

Beginning in 2016, the Field Camp Program began partnering with the University of the Pacific to offer graduate credit for teachers. There were several reasons why the partnership switched from Colorado School of Mines to University of the Pacific. First, the amount of work for the Program Manager is diminished significantly. Second, the University of the Pacific is able to market to a much larger audience and this free marketing is helpful with recruiting teachers who are not in the GSA network. As the program continues to grow, more and more teachers are discovering the Field Camps via Google searches and outside networks. Finally, the Field Camp program receives a commission from the University of the Pacific for each teacher who applies for graduate credit.

## 6. Funding

Participants are expected to pay their own registration fees. Registration fees are between \$725 and \$875 for GSA members and \$825 and \$925 for non-GSA members. In addition to registration fees, teachers are responsible for transportation to and from the Field Camps and most of their meals. Teachers who do not receive funding often pay well over \$1,000 for the Field Camp out of their own pockets, and this is the case for most teachers. The registration and travel costs often prevent teachers from attending a Field Camp.

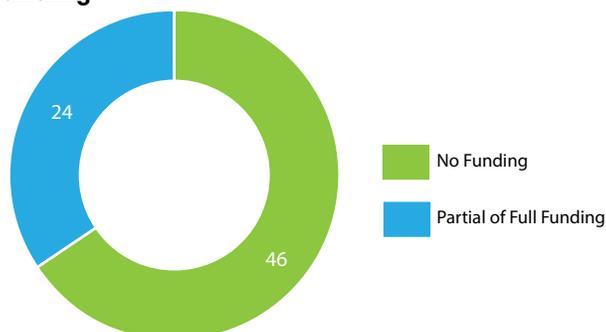
Approximately 34% of teachers are able to secure partial or full funding through outside organizations. Without teacher funding, only two of the five Field Camps would have ran. This funding was the sole reason these teachers were able to attend the Field Camp.

The following organizations recognize the value of field experiences for teachers and have provided funding for teachers to attend:

- Oklahoma Geological Foundation
- Fund-For-Teachers
- School Districts
- School PTA Foundations
- State Science Grants
- Teacher Recognition Awards
- Illinois Computer Educators
- College Education Grants for Student Teachers
- Arizona Mining Company

The GeoTeachers Program is seeking additional donors and sponsors to assist teachers and to offset administrative costs. If you or your organization are interested in providing financial support, please contact the GSA Foundation at [gsaf@geosociety.org](mailto:gsaf@geosociety.org).

**Funding**



## 7. Acknowledgments

The GeoTeachers Field Camp Program thanks the participants as well as the partnering agencies who added great value to the Field Camps.

### Participants

#### *2013 Rocky Mountain Field Camp*

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#### *2014 Rocky Mountain Field Camp*

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#### *2014 Mammoth Cave Field Camp*

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#### *2016 Rocky Mountain Field Camp*

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#### *2016 Acadia Field Camp*

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### Partnerships

#### *Rocky Mountain Field Camp*

Florissant Fossils Beds National  
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Hillary Peddicord

Henderson Mine,- Empire, Colorado  
(2013 and 2014)

Nyssa Loeppke  
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University of the Pacific (2016)

#### *Mammoth Cave Field Camp*

Mammoth Cave National Park  
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Ranger Rick Toomey  
Mammoth Cave International Center for  
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Shannon Trimboli  
Western Kentucky University  
Dr. Chris Groves

Hamilton Valley Research Center  
Colorado School of Mines

#### *Acadia Field Camp*

Acadia National Park  
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Hall Quarry  
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Denise Bluhm  
Duane and Ruth Braun  
University of the Pacific (2016)



Teachers learn about dinosaur footprints and trace fossils at Skyline Drive.

If you have questions regarding GeoTeachers Field Camps, go to

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