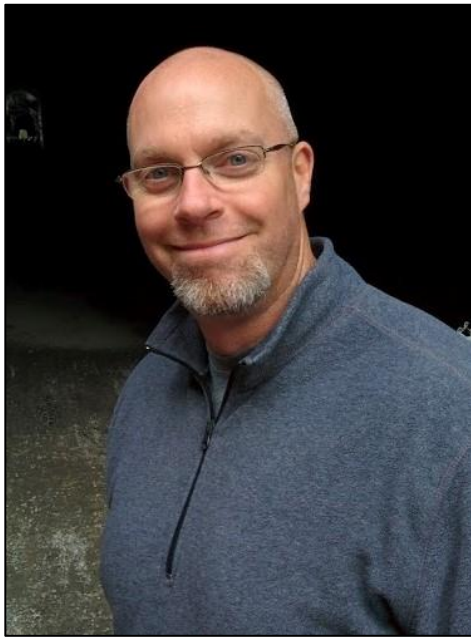


## My Earth science educator story – Chris Atchison What I did, why I did it and what happened



Chris Atchison.

### The two-minute version

I am currently an Associate Professor of Geoscience Education in the School of Education and Department of Geology at the University of Cincinnati (UC). I graduated from Wright State University's (WSU) Department of Geology (2002, 2004) and became a middle school science teacher. In 2011, I earned a PhD in Science Education from The Ohio State University and accepted an initial tenure-track appointment in the Department of Geosciences at Georgia State University (2011-2014) before accepting my current appointment at UC. My research is concentrated on improving access to the Earth Sciences for students and geoscience practitioners with various disabilities through experiential learning opportunities and inclusive workforce development. I focus heavily on Universal Design for Learning in my courses and have taught instructional development workshops and accessible field trips using these principles. Additionally, I am the Founder/Executive Director of the International Association for Geoscience

Diversity (IAGD), a non-profit organization which seeks to improve access to the geosciences for persons with disabilities and promote inclusive communities of research, learning and student support. The IAGD is recognized globally, and formally partnerships with many professional geoscience societies.



### But how did I get here? The slightly more than two-minute version

'Life' intervened during my undergraduate degree. I had my first child three weeks after finishing my undergraduate degree. I needed to stay close to home and decided to go into education. Since I was staying at WSU, going into the graduate program was seamless. I did, however, need to complete several education course deficiencies for licensure. For my master's research, I started a science club for my 8<sup>th</sup> grade students. Our project focused on the science of subsurface imaging. Over the course of several weeks leading up to a site visit at Sunwatch Indian Village and Archaeological Park in Dayton, Ohio, we studied the methods of magnetometry from a very broad, rudimentary understanding of magnetism, geomagnetism, and how magnetism is used in science. During the site visit, the students assisted in data collection using the magnetometer, and were later involved in data analysis and interpretation. This was also my first foray into accessible and inclusive science, as the project was universally-designed. I still had a lot to learn, however.

I taught middle school science for four years and then moved to Columbus to start my doctorate at the Ohio State University and was, at the same time, hired as an educational technology consultant for the state of Ohio, and later for the Ohio Supercomputer Center (OSC). While working at OSC, I befriended Don Stredney, Director of the Interface Lab, who was primarily working on the use of virtual reality (VR) in biomedical applications. I was interested in recreating a geologic landscape in VR to study the effectiveness of using different technology applications to access a field site when students were unable to physically visit due to geographic or financial barriers. Don was interested in the idea and quickly became a great friend and mentor.

Collaborating with the OSC Interface Lab, we began creating the simulated environment after gathering LIDAR scan data of the Historic Tour route from Mammoth Cave National Park from the Cave Research Foundation. My goal was to then find a group of students who had never been in a cave, let alone Mammoth Cave. I hoped their unbiased perspectives could be used to evaluate the effectiveness of the virtual environment compared to the actual field site. From the beginning, I wanted to work with students who were wheelchair users. As a WSU graduate, I was well aware of the strong commitment to access and inclusion on campus, and the dedicated staff of the Office of Disability Services (ODS). The WSU ODS was also very committed to research and getting their students involved in practical experiences, which is very rare in most institutions of higher education. My decision to recruit students from WSU was easy, and after pitching the idea to the ODS staff, they were immediately supportive and excited about

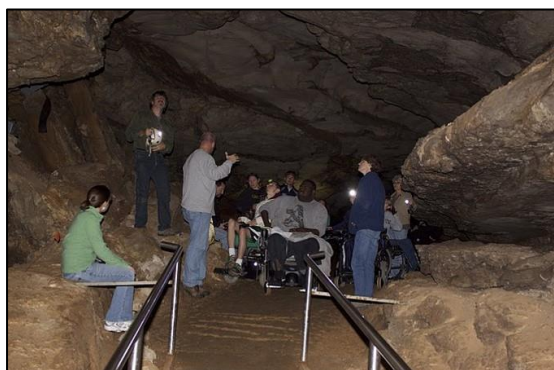
giving their students the learning experience.

I selected six students with mobility disabilities to participate in the study. Three males, three females, two graduate students and four undergrads. None were geology, or even science majors. To catch them up on the geology of the project, I hosted three, three-hour class sessions on consecutive Friday afternoons. We spent this time talking about the basic aspects of cave and karst geology. Of course, these sessions included dinner and a good amount of social time. Getting to know each other was as much of a priority as the science. I was taking the students to a location that they had never been given an opportunity to experience. Anxiety was evident, and I needed them to know they could trust me. We spent a lot of time talking about reciprocal efforts: what the students could expect from me; what my goals of this project were; and how I was going to share the experience with the broader geoscience community. I made sure that the students were aware that I while I was sharing the science with them, they were the experts on their abilities and experiences. Working with six wheelchair users, all with significantly unique abilities that required very different supports and accommodations, I had a lot to learn, but I wanted to know as much about these students as they were willing to share.



The group at the visitor centre.

After three-weeks of basic geology instruction, we left the classroom for a three-day weekend at Mammoth Cave National Park in Kentucky in the USA. Obtaining access to the field site took nearly one-and-a-half years of logistical planning, to ensure the safety of the students and maintain the policies of Mammoth Cave National Park that, at the time, did not offer a publicly accessible tour route. Three primary areas of the cave system were explored: an overlook of the sinkhole landscape (recharge area), the cave passages, and the River Styx spring leading to the Green River (discharge area).



Inside Mammoth Cave. ([www.TheIAGD.org](http://www.TheIAGD.org)).

At each location, students were required to make observations and reflect on the overall experience. While inside the cave, rather than just making observations, students were divided into two groups and given instructions and instruments to collect measurements of the cave passages. Once back at the research center, students worked collaboratively across teams to construct maps of the passages. The experience gave them an overwhelming sense of purpose and accomplishment. Reflections were full of excitement of the experience and a new found sense of adventure catalyzed by the opportunity to explore. Some mentioned they wished they had known about accessible geology earlier and would have considered taking more classes during their degree programs. On top of all of

this, the six students came together as a community unlike anything I had ever experienced. Their connection to each other and the project staff had seemed to be strengthened through the overall experience. Something amazing had just happened, and suddenly my dissertation project, and career, began to change directions.

Most people ask why I am interested in working to promote access and inclusion. I have never personally been impacted by a significant disability, and I did not grow up with a strong understanding of diversity. I can honestly say that this experience and working with these students had a major impact on me personally. Broadening participation research requires you to get to know someone who lives, works, looks, acts, and thinks differently than you do. It takes stepping out of your own comfort zone and being transparent and vulnerable. Everyone deserves to have opportunities to follow their interests and passions. Witnessing the sheer excitement of seeing a student experience the natural environment in a way they had never thought possible, seeing something for the very first time in a location commonly considered inaccessible, will change you. It most certainly changed me.

A major outcome of this first project was the development of a grassroots organization to address the lack of individuals with disabilities persisting in geoscience certificate and degree programs, and noticeably missing from the workforce. Prior to the mid-2000s, few researchers were recognizing the inaccessibility of the traditional methods of geoscience training programs and were working to promote the need for greater accessibility for students who were not physically able to participate. However, most of the work being disseminated involved conference presentations by



geoscience instructors working to support students with various disabilities enrolling in their introductory courses. Additionally, while practitioner work did present the need for increased access and inclusion, most peripherally mentioned the inclusion of students with disabilities in field studies. Nonetheless, all this work had laid the foundation for inclusive geoscience education.

Today, the International Association for Geoscience Diversity (IAGD) is a non-profit organization charged with advocating for improved access to the geoscience disciplines for students and geoscientists with disabilities, while identifying current research opportunities and instructional best practices that promotes full inclusion. The IAGD network is global. There is no charge to be a part of the IAGD, and members are leading various activities such as professional development workshops for geoscience instructors, graduate teaching assistants and primary to secondary science teachers; accessible field trips for geology staff and students with disabilities; providing student and faculty mentoring; and evaluating field sites to promote the inclusion and full participation of students with diverse physical and sensory abilities.

Since the first accessible field course at Mammoth Cave National Park, we have offered several accessible field trips in connection with the Geological Society of America meetings and week-long field courses in northern Arizona, western Ireland, and the Isle of Anglesey in northern Wales.



Chris in Ireland.

Most of the trips offered not only include students as well as staff and geoscience practitioners with disabilities, but they are also designed as field-based workshops and encourage participation of instructors who are interested in learning how to include and support the abilities of all students in their field courses. Learn more and connect with us at [www.TheIAGD.org](http://www.TheIAGD.org)



*Chris Atchison, age 44, Cincinnati, Ohio, USA, September 2018, christopher.atchison@uc.edu*