Vol. 1 Issue 2 April – June 2023

# FAULTED DIGEST

## AIPG Colorado Section Publication

Vol. 1 Issue 2 April – June 2023

## Summer Activities Recap Exclusive

Brought to you by AIPG Colorado

*Colorado National Monument*: Image Provided by Jessica Davey

# The President's Message

June 2023

Happy summer! After such a long, cool, and wet spring here on the Front Range, it finally feels like summer has arrived with some hot sunny days.

For this newsletter, I'd like to discuss ethics, and specifically the AIPG Code of Ethics. You may have had similar experiences as I have, sitting in ethics training and thinking how some of the presented scenarios sound so far-fetched or thinking "Would anyone really say this in real life??" Well, I learned through some experiences during the past few months that there is real-world evidence for these scenarios; unfortunately, some people do not adhere to a strong internal code of ethics, and things that should never be thought or said out loud actually do take place.

I have been so grateful to our Code of Ethics and our Ethics Committee as a foundation for some difficult decision-making I have had to do recently. It has always been challenging for me to take a stand, especially when my career is at stake. Having AIPG there for support and the Code of Ethics as a guide, made this experience easier to navigate, and gave me the courage to do what was right.

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
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Have you had to rely on the AIPG Code of Ethics? I'd love to hear your stories and discuss how you handled your situation(s).

I am incredibly passionate about AIPG and am very proud of the wonderful network of members we have here in Colorado. I invite you to reach out to me if you have any thoughts or questions about the Colorado Section or if you would like to get involved in any way. My phone number is 720-394-4270, and my email address is davey.jessica7@gmail.com. I look forward to meeting you if I haven't already!

Please keep an eye on your email or our Section's website (https://aipg-cosection.org/) for notices and more information as we coordinate activities and add dates to our calendar. The Colorado Section switched to a Star Chapter-hosted website last year, which centralized all of our communications and event hosting. If you are not receiving our emails, please check your spam folder and save our email addresses as contacts or send me an email at davey.jessica7@gmail.com to ensure you don't miss out on any of our upcoming opportunities or events.

Thank you for being involved in our amazing organization, and I look forward to seeing you at an upcoming event!

Jessica Davey, MEM-3242

2023 Colorado Section President

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We still have a need for pictures. It is strongly encouraged that everyone send high-definition, clear pictures they may have taken in Colorado to be used in the newsletter. This is also an opportunity for others to see your beautiful photos! Please include the location of where the photo was taken and what it is we are looking at. I will open up a link for sharing these images below.

We are still prompting everyone to also share their stories and adventures! Any articles, letters, and publications would be appreciated. Any informative pieces, publications, or interesting articles that are noteworthy and related to general geology or Colorado geology would make a great filler to our newsletter!

Thank you again and as always, I'm looking forward to the next edition of the newsletter!

Christina Tiggemann
*AIPG Colorado Newsletter Editor*

# EDITOR'S NOTE

Faulted Digest. Volume 1, Issue 1 is published four times a year. This newsletter is distributed free to members. **Paid Subscriptions:** $1 million. Please send check or money order to Christina's home address along with a baby t-rex.

A copy of our newsletter will also be available https://aipg-cosection.org/content.php?page=news.

**Submission Information:** Pictures, letters, announcements, etc… must be received by the editor the 2nd to last week of the following months: March, June, September & December**. Email preferred to:** christina.tiggemann@gmail.com. **Formats Accepted:** .doc, .docx, .pdf, .png, .jpg, .jpg.

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***The opinions expressed are those of the authors and not the Colorado Section officers unless clearly stated otherwise.***

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*Roxbourough State Park*: Image Provided by Michael Levine-Clark

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***Proud member of AIPG, GSA, RMAG, AWG***

# In Memory Of

# James Patrick O'Brien

## December 26, 1961 – May 7, 2023

James Patrick "JP" was born December 26, 1961 in Mt. Kisco, New York and passed peacefully May 7, 2023 at his home in West Vail. JP moved to the Vail Valley in 1971 and graduated from Battle Mountain High School in 1980 as a member of the ski team. He then went on to attend Colorado State University and then earned his geology degree from Fort Lewis College and a master's degree from Idaho State University. JP's choice of schools allowed him to maximize outdoor fun. He was an accomplished back country skier in his time. JP returned to Colorado and worked in the Denver area for about 10 years. As he had always dreamed, JP fled the Front Range and returned to the Vail Valley in 2000. JP then invested in real estate, taught geology and orienteering at CMC and worked for CGS on the mountain. He concluded his career as a hydrologist at Eagle Mine in Gilman. JP was a free spirit who lived life his way. JP is survived by siblings Pamela Ann O'Brien (spouse Lou), Deborah Stewart (spouse Maurice "Maury") and Paul W. O'Brien (spouse Margret). Also survived by nephews Devon, Robert, Paul and Jack and nieces Julia, Racel and Krissy and of course his beloved dog, Riva. A BIG celebration of life has been scheduled for June 28, 2023 from 1:00 p.m. to 6 at Donavon Park!

Image Courtesy of *No Film School*

# Sarah Leather

**Education:**

- Graduated University of Colorado - Boulder in Summer 2023

**Professional Experience:**

- United States Geological Survey – Lakewood (Current)
  *Student Contractor for Jean Morrison & Chris Mills*
  *Developing new methodology for suspended sediment sampling using continuous flow centrifuges.*
- Junior Year – Undergraduate Research – Benson Organic Geochemistry Lab
  *Isolating core lipids from the Samail Ophiolite*
- Sophomore Year – Internship – AKT Peerless; Private Consulting
  *Shadowed groundwater and soil sampling*
  *Compiled soil manuscripts for reimbursement of the company from a state agency*

**Professional Organization Involvement:**

I registered at CU Boulder as an AIPG Student chapter in the Spring of 2023 during my Vice Presidency of the Geology Club. As a CU Boulder alumni representative, I am also a student member of the American Water Resources Association and the Geological Society of America.

**Why I Want to be a Geologist**

I don't want to be a Geologist; I need to be a Geologist. I was inspired by a high school Marine Biology teacher to study the environment. He spoke so urgently about real problems, ocean acidification, superfunds, coal, PFAs, cobalt. . . Teslas. He wasn't a geologist, but it was close enough.

I used to be afraid that robots would take my job as a kid. Now, I don't think any robot can currently do what I do. Yes, my career goals centered around being outside and traveling, but I needed to be ethically fulfilled in the job that I was doing. It is not about being "progressive" or "climate-friendly," it is completely about reconnecting with my own human nature. My nature is to be wild. Scouring across mountains, seas, and glaciers for sites unknown and scientific stories unheard. My nature is to dump knowledge on random people who don't care for Uranium roll front deposits. My nature is to get excited about amazing remediation projects that would protect land for generations to come. My nature is to allow the Earth to be my teacher. I have this life-long craving to learn from the land instead of humans teaching the land how to be. Rocks don't care for my existence, they don't care. But they take care in balancing Earth's many cyclical systems. I am not asked to do this because I care; I simply take care because that is my role as a human. I am not just a Geologist; I am a learner and I am a partner of this planet.

I didn't know that this is where I would end up. If you asked me what I wanted to be at 16, I would've told you I wanted to be a comedian. That obviously didn't work out. But my dream lives on because I've never laughed harder than with my colleagues in the field, I always come back with an arsenal of inside jokes. The long days of fieldwork and the bonding that arises, I wouldn't trade it for any other career.

I wish great success to all of my fellow colleagues.

Cheers,

Sarah Leather https://www.linkedin.com/in/sarahleathergeology

***The American Institute of Professional Geologists - Colorado Section is proud to have Sarah as an Early Career Professional member!***

Image: The Colorado Plateau; Courtesy of *National Park Service*

# Early Career Professional Spotlight

Image Courtesy of *No Film School*

## Nick Coscarella

**Education:**

- Metropolitan State University of Denver, Applied Geology - Summer 2023
- Pursuing a Master's Degree

**Professional Experience:**

- 360º Geologic Virtual Tours
  *Virtual Presentation to CO AIPG May 2022*
  *Supplementation of 360º tours to students along with others*
  *Current project: https://linktr.ee/NicksGeologicTours*
- Senior Year – Undergraduate Research
  *Preserving the stratigraphy and Analyzing the Karst - Leakage potential at the Future Glade Reservoir Site*
- Sophomore – Senior Teaching Assistantships
  *Upper Division Courses for Dr. Uwe Kackstaetter & Dr. Barb EchoHawk*
  *Assignment design and conceptual assistance*

**Professional Organization Involvement:**

Nick served as the vice president of the geology club at MSU Denver during the previous spring semester, and the geology club is currently in consideration for the AIPG Student Chapter of the Year Award. Nick was also one of the two winners that earned the Rex Monahan Geological scholarship award that AIPG offered specifically to members within the Colorado Section. Nick is currently an active member of the Geological Society of America (GSA) and the Rocky Mountain Association of Geologists (RMAG), and is affiliated with the National Society of Collegiate Scholars.

**Why I Want to be a Geologist**

Ever since a young kid, I have always enjoyed the outdoors and have always admired rocks and fossils. Like many other kids, I would enjoy collecting rocks that looked cool, but my interest for the specimens I collected was deeper beyond the unique appearance. I would always ponder about where the rocks that I collected came from because I thought it was particularly interesting learning about how the samples I collected were formed. I started to develop a keen sense for identifying different rocks and fossils at a young age and little did I know this would benefit me immensely in my future endeavors. Once I started progressing through school and began taking science classes, I became captivated with studying geology because it explains the entire history of Earth. I began to realize that geology is much more than studying rocks, and I realized how much geology has influenced modern science and the world today.

Now that I am an undergraduate student at MSU Denver, my passion and ambition to learn more about the vast science of geology has only grown exponentially. Having just graduated in the summer of 2023, I have become engrossed and interested with learning about the job opportunities within geological engineering, hazard mitigation, and exploration geology. Exploration geology is so fascinating to me because not only are new discoveries made each day, but mineral exploration is largely why humans are capable of developing the modern technology and machinery utilized worldwide. Also, not only do other types of geologists, such as hydrologists, deal with the quality, quantity, and transportation of Earth's most valuable resource (water), but geologists are immensely needed to study and prepare for adverse natural events such as earthquakes, tsunamis, and volcanic eruptions. Along with monitoring natural disasters, geologists are responsible for engineering infrastructure that mitigates against significant events. The more geology courses I take and the more research I do, the more evident it becomes how important geologists are in everyday life and how crucial they are to human survival and to the advancement of society.

From extracting minerals and resources that advance modern civilization to predicting and mitigating against some of nature's most deadly natural forces, geology is a fundamental and pivotal science that is crucial to modern life. As job opportunities in geology continue to grow and emerge into the future, it is exhilarating knowing I have chosen a major that is so enjoyable and that is so important. Geologists are required in a wide array of job applications, and they constantly work with the physical world to reveal the past and to further advance society. As an ambitious scientist, choosing a career in the field of geology seems like the best choice to not only make a difference, but to play a significant role in the future of human development.

***The American Institute of Professional Geologists - Colorado Section is proud to have Nick as an Early Career Professional member!***

Image: Dinosaur National Monument; Courtesy of *Posnov/Moment/Getty*

Information sourced from *mindat.org* and *Smithsonian Nature Guide*

"Named in 1832 after the large deposit of this mineral found on the island of Anglesey in Wales, anglesite is colorless to white, grayish, yellow, green, or blue and often fluoresces yellow under ultraviolet light. It commonly occurs in massive, granular, or compact forms. It has a number of crystal habits: thing to thick tabular, prismatic, pseudorhombohedral, and pyramidal with striations along the length. Exceptionally large crystals—up to 31 in (80 cm) long—have been found.

Used since ancient times as an ore of lead, anglesite forms in the oxidation zones of lead deposits. It is an alteration product of galena, formed when galena comes into contact with sulfate solutions. Anglesite is sometimes found in concentric layers with a core of unaltered galena."

# Summer Sulfates

## Anglesite

$PbSO_4$

Image Courtesy of *National Gem Lab*

**Physical Properties of Anglesite**

| | |
|---|---|
| **Luster:** | Adamantine, Resinous, Vitreous |
| **Transparency:** | Transparent, Translucent, Opaque |
| **Color:** | Colorless to white, often tinted grey, yellow, green or blue; colorless in transmitted light. |
| **Streak:** | Colorless |
| **Hardness:** | 2½ - 3 on Mohs scale |
| **Tenacity:** | Brittle |
| **Cleavage:** | Distinct/Good, Good on {001}, distinct on {201}; on {010} in traces. |
| **Parting:** | Translation gliding and twin gliding occur (as in baryte). |
| **Fracture:** | Conchoidal |
| **Density:** | 6.37 - 6.39 g/cm$^3$ (Measured)<br>6.36 g/cm$^3$ (Calculated) |

**Fun Fact:** ***Anglesite*** is soft and easily cleaved. It is one of the stones used to test the skills of master gem cutters.

*Dinosaur Ridge*: Image Courtesty of: Jessica Davey

*If you would like to volunteer to participate in* the Girl Scouts Day at Dinosaur Ridge coming up ***on Saturday, October 14, please reach out to me at davey.jessica7@gmail.com.***

# Cub Scouts Day at Dinosaur Ridge

An Article by Jessica Davey

The Scouts Days at Dinosaur Ridge are always an extremely fun activity! The AIPG Colorado Section has participated in these events for several years, and it's inspiring to assist the kids in earning badges in Earth Sciences, Geology, and Paleontology, among other science-related topics.

May 13, 2023, proved no different. While the weather was a bit chilly and there was a threat of rain in the forecast, the theme of the day was quality over quantity. The kids and their families who attended the event were highly interested in what we were discussing at the AIPG booth. This year, we were tasked with explaining the meaning of the word geology, teaching the Moh's hardness scale, and discussing career opportunities in the geosciences. With the help of Shannon Rentz, Jim Paschis, and Fred Barnard, as well as my daughter, Ayda, we successfully guided the Scouts in crossing all of these items off their badge requirements lists.

*Dinosaur Ridge*: Image Courtesty of: Jessica Davey

Background image sourced from: *The German Village Shop*

# Metropolitan State University Students Venture into the Alps

An Article by Christina Tiggemann
All images taken by C.R. Tiggemann unless otherwise stated

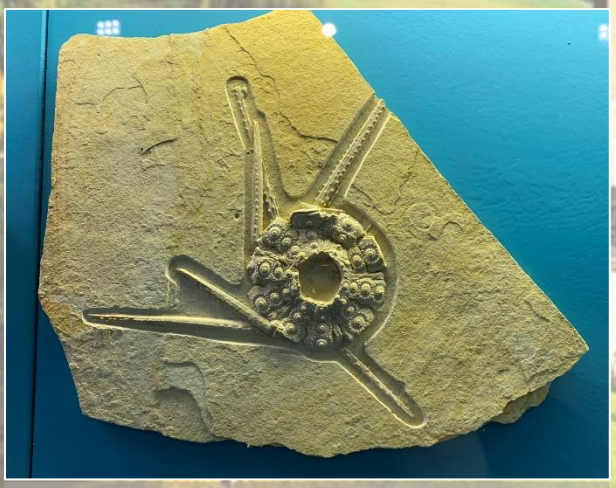
MSU Denver students had an excellent summer opportunity to study geology abroad in the European Alps. Their journey began in June, starting in the beautiful city of Nürnberg, Germany, and ending in Marktrodach, Bavaria, Germany. This 16-day excursion consisted of more than 1700 miles spanning four countries!

**Solnhofen, Germany**

While in Germany, students enjoyed history, visits to fossil museums, quarries, castles, and more! One highlight from the journey was the visit to Solnhofen, famous for its fossil preservation! This area is surrounded by limestone, which holds and preserves details quite well, making it ideal for fossils. One would find the remnants of the *archaeopteryx*, an early ancestor to modern-day birds, along with numerous marine fossils here.

"Crab-like decapod ('Stockkrebs'). Shallow water platform, margin of the Solnhofen lagoon. (149.5 ma)" (*Solnhofen Museum*).

Partial city view from Imperial Castle of Nürnberg, upper walkway.



"Lancet sea urchin with spines. Stony soft-grounds of the shallow water platform, margin of the Brunn lagoon, Brunn sub-archipelago (151.5 ma)" (*Solnhofen Museum*).

# Neuschwanstein Castle

Located in Schwangau, Germany, Neuschwanstein Castle was once home to King Ludwig II. For much of the trip, students learned about some of the history surrounding many of these beautiful locations. King Ludwig II was born in 1845; his reign began in 1864 and lasted until his "mysterious" death in 1886. Ludwig lived in a somewhat fantasy world, that only he considered to be reality, kept to himself, and shut out strangers from the outside. His mother is quoted as saying, "Ludwig enjoyed dressing up … took pleasure in play-acting, loved pictures and the like … and liked … making presents of his property, money, and other possessions". At 18, Ludwig ascended to the throne with no experience. He was aware of this fact and had mentioned he was not done learning and would have liked to return to his books, but this never happened. Eventually, as he sunk more into his "reality" world, this would result in his reign's end. After a threat to seize the property in 1885, Ludwig refused, and the government declared him insane and unable to rule in 1886. He was cast away to Berg Palace, where he died the next day in Lake Starnberg. It's been said that King Ludwig II was a great swimmer; therefore, his death was quite a shock to many.

Information Source: *Neuschwanstein.de*



Background image sourced from: *The German Village Shop*

## Innsbruck, Austria

Onward to Austria! Another term students would add to their geology dictionary was ‘nappe stacking,’ the constant thrusting of the Alps. Much of this part of the Alps is contorted in various ways; sideways, overturned, near vertical structures are almost everywhere you look, thrust faulting on repeat! The composition of these rocks would have been created by deep ocean sediments, pre-orogenic, called ‘flysch’ and consists of a sedimentary system, finer to coarser clays, graining upward and repeating. Several angular unconformities also impact the area. A number of basins were created post-orogeny, the most well-known being the Molasse Basin. The basin consists of ‘nagelfluh’, chunky coarse conglomerates, and ‘frictionite’ (“rug-burned” rocks).

After a long hike and a rather exciting cable car ride, students finally make it to the Top of Innsbruck at 2256 m (7401 ft)!

To reach the full extent of the mountain, at the peak of Hafelekar (2334 m (7657 ft)), is just another short hike to the top, where the views and the rocks of course were just perfect!

Image taken from the balcony of Neuschwanstein Castle

Just look at the folding and near vertical tilt on those rocks! On this hike students were able to see much of the contortions discussed for the day as they took a trail that ran along a small river and the charming countryside in South Tyrol, Italy

**Salzburg, Austria**

Amongst the travels, there were visits to mines. One, in particular, is Berchtesgaden Salt Mine. This mine has been operational for almost 500 years. The salt in this mine is not entirely pure, and its composite rock average is around 50% salt content. The mine utilizes a wet mining method. Roughly 900,000 $m^3$ (~237 million gallons) of brine are extracted annually. For this process to work, 2.000 $m^3$ (~528 gallons) of fresh water is required daily. Information sourced from: *salzbergwerk.de*

Student prepare to enter the salt mine…….in more than one way. The train was only the first entrance into the mine. The second obstacle students had to face was the 36 m (118 ft) long slide (yes, we said slide) that would drop miners down into the mine back in the day.

**Glück Auf!**

The translation of glück auf is “Luck Up.” As one would suspect, this is what miners would say to each other before entering the mine as a way to say, “good luck” and care for each other.

Image near Fusch an der Großglocknerstraße

# Großglockner Hochalpenstraße

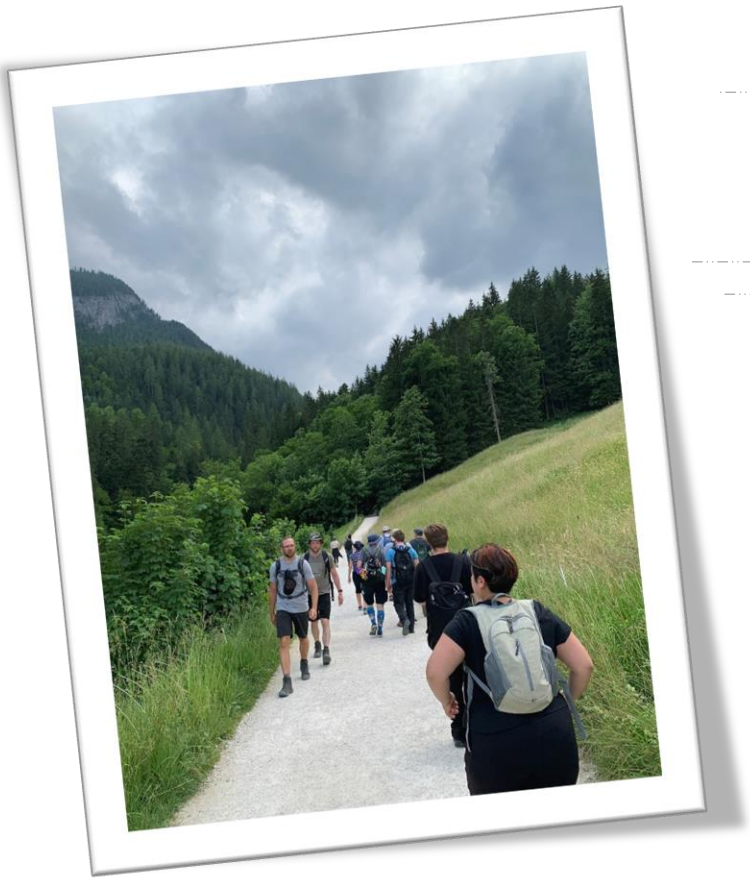
Grossglockner High Alpine Road was another one of the highlights in Austria. “The highest point of the mountain road is the Edelweissspitze, located just above 2,500 m. Several 3,000 m peaks open up to the wandering gaze, but the largest of them all is the Großglockner. The striking mountain towers above the entire region at 3,798 m (~12,400 ft) and is at the same time the highest summit of the Alpine Republic” (*Grosslglockner.at*).

This area also has an interesting geologic feature, The Tauren Window, with unusually high elevation and basement rock sticking out. Four gneiss cores reside at its center. The window is roughly 100 miles in length. The lower part of the window is schist from The Habach Series, and the upper portion of schist originates from the sedimentation basin of the Piemonte Ocean. It also includes limestone and dolomite deposits from the Mesozoic in the Tethys Ocean.

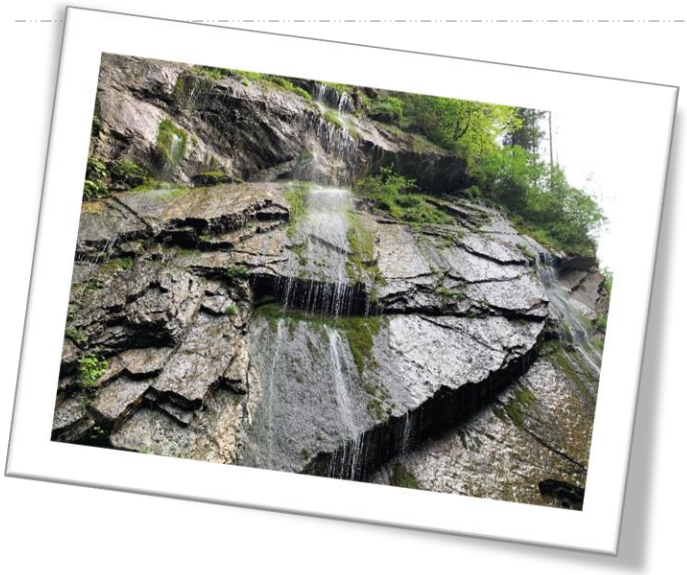
Großglockner is one of the many peaks that lie within the window.

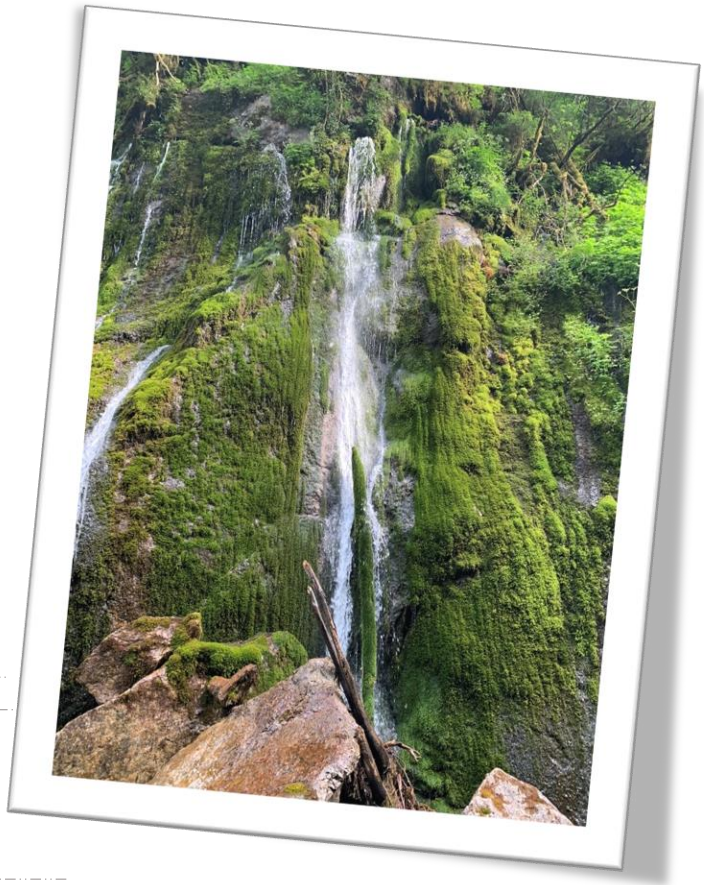
Information sourced from: *hohetauern.at*

Image from top of Großglockner Pass scenic stop



Another hike in Austria features some magnificent waterfalls near Berchtesgaden. Much to everyone's surprise the waterfalls here were not fueled by glaciers or…





…a lake even. The water storage here is from unconsolidated materials (gravel) and seeps through the cracks of the bedrock and pours out sideways from the rocks.

Image taken at Lago di Braies by L. Kackstaetter

# WELCOME TO DOLOMITI BELLUNESIT NATIONAL PARK

"The geological uniqueness of the Dolomites is largely due to the combination of three natural forces; marine sedimentation, endogenous lifting, and erosion" (N. Coscarella, 2023). Each student was responsible for a presentation for different parts of the trip. Nick Coscarella knocked one out of the park for his presentation day in the Dolomites, discussing formations, history, and more.

Carbonates here were formed from tidal flats and algal mounds and have been deemed a carbonate platform for its hydrocarbon reservoirs. The Dolomites' Triassic platform and basinal bodies rely on outcrop analogs from shallow water carbonate systems.

The Dolomites are more brittle from chemical weathering. The top of this system will consist of magnesium and crystalline structures. Limestone structures are towards the bottom. "Sometimes in carbonate platforms, the rate of carbonate production balances the rate of subsidence" (N. Coscarella, 2023).

**Lago di Misurina**

The day consisted of visits to many lakes, which North Italy is so aptly known for. Lago di Misurina was the first of these lakes. The lake was formed from deformation. This is the largest lake in the Dolomites and has a unique feature; it has some of the cleanest air in the world. This particular location hosts two centers for the treatment of respiratory diseases. The reasoning is high altitude, low air density, an almost complete absence of flowers and pollen, and richness of ultraviolet radiation.

**Lago di Landro**

The next stop was Lago di Landro at an altitude of 1406 m (~4600 ft). Here you will find Mt. Cristallo, its composition, as you may have guessed, is dolomite and has four summits higher than 3000 m (~9800 ft). From greatest to least the peaks are as follows; Monte Cristallo (3221 m), Piz Popena (3153 m), Cristallo di Mezzo (3150 m), and Cristallino d'Ampezzo (3008 m).

**Lago di Braies**

The last stop was the gorgeous Lago di Braies. This alpine lake is 1439 m (~4700 ft) above sea level. The lake's formation is from a natural dam resulting from mud drainage. It has a water surface of thirty-one hectares (~77 acres) and is 17 m (~55 ft) deep with a max depth of 36 m (~118 ft). The dominating presence in the background of the lake is Seekofel standing at a resounding 2810 m (~9200 ft).

Image above: Lago di Landro. Image below: Lago di Braies

# Italy:
# Venice, Pisa & Carrara

**Venice, Italy**

Venice has many subsidence issues and storm surges. Most of the water around Venice is brackish. Compared to the Mediterranean Sea, which has high salt content, around 40% saline content, the brackish waters of Venice rank in at only 2.8 – 3.0 % salt content.

One thousand four hundred years ago, Venice was swarmed by invading armies. The marsh/swamps in the area served as a "barrier/hideout" that no one wanted to invade.

Building materials did not last long in the salt water, so they had to use materials resistant to weathering, such as dolomite. Homes were built on this material, and locals discovered that by doing this, the structures they were building were slightly more resistant to the salty sea waters. You can see this in some of the current-day structures around the city.

**Pisa, Italy**

The Leaning Tower of Pisa is made of white marble and is known for its distinct tilt. Construction began in 1170 and was completed sometime around 1370. During its construction is when it started to lean southward. The tower came to a maximum tilt of 5.5 degrees in 1993. The Reason the Tower Tilts: The tower sits atop alluvial sediments on an unstable soil surface. The tower continued to tilt for some time because of soil creep and groundwater fluctuation. In 1993, the tower was stabilized for safety before a sudden collapse could happen. This does not necessarily mean it won't collapse one day, but it also depends on the drainage system on the north side of the tower.

**Carrara, Italy**

Also called "Luna Marble," Carrara marble has been mined from this area for over 2000 years (Ancient Roman times). Some of its uses include the construction of cathedrals, sculptures, and monuments. How Did All This Marble Get Here? Around 65 mya high water pressure compressed deposits left behind by calcite-rich organisms below sea level. As the water body evaporated, what was left behind was limestone. Compressional forces then took hold, and the limestone was buried underneath numerous rock layers. The combination of heat and pressure caused the limestone to metamorphosis into marble. The limestone compressed at this location is of the purest quality, so we get the white marble in Carrara. The limestone compacted with clay or iron in the mixture gives the darker-colored marbles.

# The Matterhorn

Zermatt, Switzerland

Above & Below: Hiking through Gorner Gorge's twists, turns, and multiple sets of stairs, following what nature has carved out for us

The students prepared their hiking legs this day and had numerous adventures near The Matterhorn. Stop one was Gorner Gorge, sculpted roughly 200 mya now creates the beautiful chasm seen at the gorge, cutting through some exquisite serpentinite.

Next was the nearly 2-mile hike toward the mountain, which followed the landscapes and geology through wooded paths and small villages, creating one of the most picturesque landscapes one would only see in movies or on the internet.

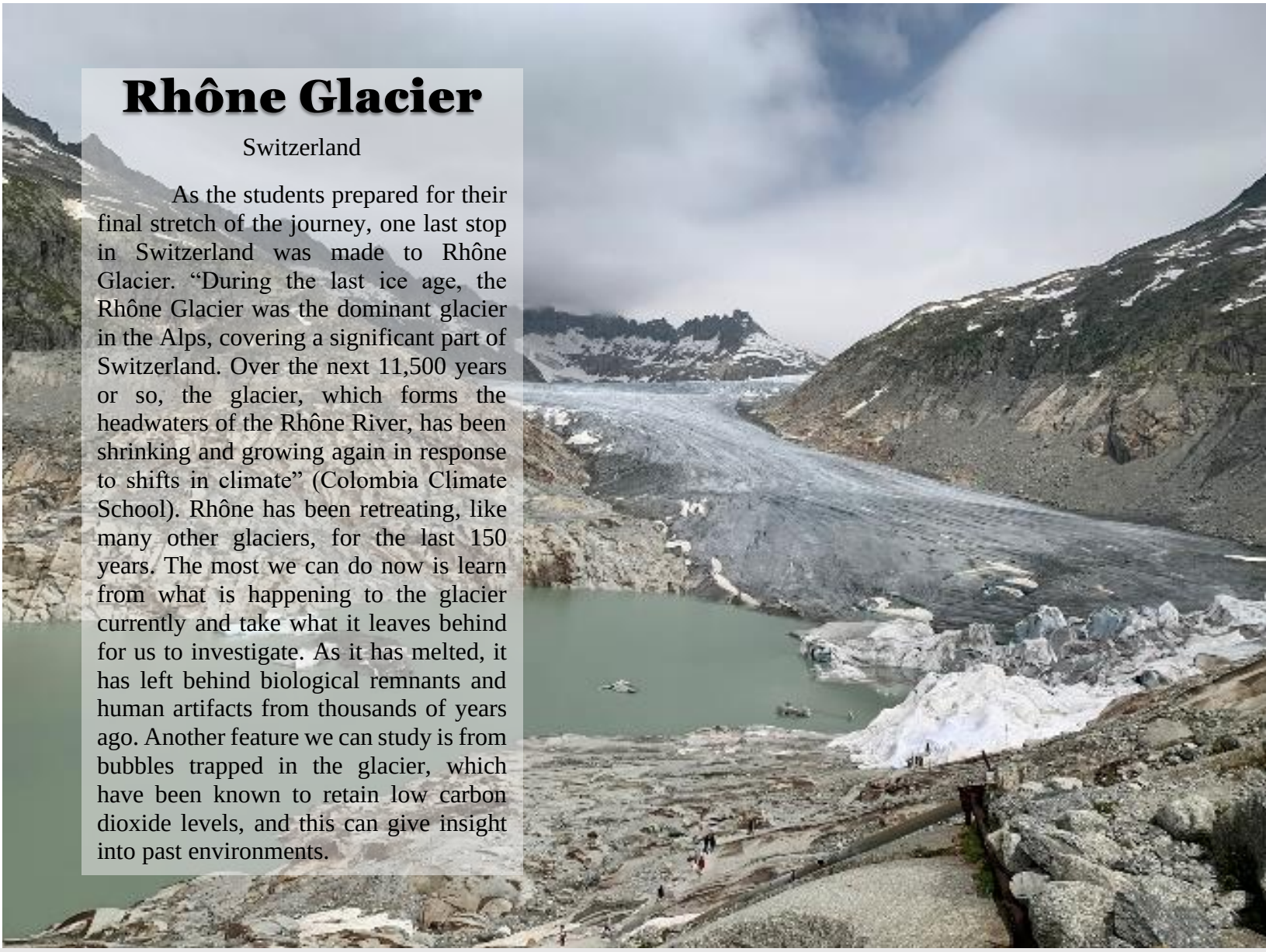
The Matterhorn and surrounding area is composed of a giant geological sandwich. Below the base of the mountain are the remnants of the European plate, just above this layer, and a portion of the bottom of the mountain is the Tethys Ocean plate, and at the top of the mountain is the old African plate. The combination of these three plates now creates the overthrust we see today. The mountain holds an abundance of greenschist formed from lava in the ocean. Digging around the top of the mountain, one would also find numerous gneisses created from the sea floor of the Tethys.

Pictured above: Accompanying students on the trip were two of MSU's finest. If you look closely, you may just find them in their natural habit, doing what they do best, teaching the students a thing or two about geology in Switzerland's outstanding landscape.

# Rhône Glacier

Switzerland

As the students prepared for their final stretch of the journey, one last stop in Switzerland was made to Rhône Glacier. “During the last ice age, the Rhône Glacier was the dominant glacier in the Alps, covering a significant part of Switzerland. Over the next 11,500 years or so, the glacier, which forms the headwaters of the Rhône River, has been shrinking and growing again in response to shifts in climate” (Colombia Climate School). Rhône has been retreating, like many other glaciers, for the last 150 years. The most we can do now is learn from what is happening to the glacier currently and take what it leaves behind for us to investigate. As it has melted, it has left behind biological remnants and human artifacts from thousands of years ago. Another feature we can study is from bubbles trapped in the glacier, which have been known to retain low carbon dioxide levels, and this can give insight into past environments.



Pictured below: The glacier may be retreating but one can still journey inside part of the glacier to take a peek at what is happening on the inside.

Image taken by L. Kackstaetter

Part of the giant crinoid family that was preserved and recovered from a driftwood colony

# Urweltmuseum Hauff

Holzmaden, Germany

Before heading back home there was one more opportunity to stop at another well-known fossil museum in Holzmaden, Germany. In the 1800s, the founder of this museum wanted to go into shell mining. The oil excavation of the site eventually led to the finding of more fossils than oil. In 1892 the first *ichthyosaur* fossil was found. In 1909 production ceased being a slate mine and was now purely in fossil mining production. Long ago, most of Germany and western Europe was covered in the ocean we know to be the Tethys and was full of life, such as corals, the *ichthyosaur*, and *plesiosaurs*. Several parts of the sea were anoxic environments. When creatures ran the course of their existence, they would sink to the bottom of the sea at the end of their life. With some time, a little bit of chemistry, and some shaking around of the plates, we now have the fossils we see today.

**The Ichthyosaur**

Otherwise known as the "fish lizard," lived during the Triassic-Jurassic and went extinct in the Cretaceous, primarily due to competition of giant reptiles. Because of how well these creatures have been preserved in the limestone, during the discovery of one of these fossils, we discovered this creature's diet, that it had large eyes, was a deep diver, and had a fluked tail. One fossil was even found to have the outline of its skin still!

Students were ecstatic to find numerous fossils of their own, including pyritized ammonite casts. That’s a whopper!

# National EVENTS

**National Brownfields Training Conference**
**Aug. 8, 2023**
https://aipg.org/events/EventDetails.aspx?id=1764316&group=

## August 2023

**13th: Highway Geology Symposium**
https://aipg.org/events/EventDetails.aspx?id=1764318&group=

**14th: National Council of State Legislatures Legislative Summit**
https://aipg.org/events/EventDetails.aspx?id=1764319&group=

**15th: AIPG Free Webinar: Cognition-guided learning in the Geosciences**
https://aipg.org/events/EventDetails.aspx?id=1765492&group=

**22nd: Colorado Oil and Gas Association Energy Summit**
https://aipg.org/events/EventDetails.aspx?id=1764323&group=

**26th: Society of Economic Geologists Annual Meeting**
https://aipg.org/events/EventDetails.aspx?id=1764324&group=

**29th: AIPG Lunch & Earn - Three Decades of US/China Collaboration in Karst Hydrogeology and Environmental**
https://aipg.org/events/EventDetails.aspx?id=1762209&group=

## September 2023

**16th-19th: AIPG 60th Anniversary Conference**
https://aipg.org/page/202360thAnniversaryConference

**17th: Fundraisers for Foundation of AIPG**
https://aipg.org/events/EventDetails.aspx?id=1749495&group=

**19th-24th: AEG Annual Meeting**
https://aipg.org/events/EventDetails.aspx?id=1712373&group=

**21st-22nd: AIPG GA Section — 10th Conference on Innovative Environmental Assessment and Remediation Technology**
https://aipg.org/events/EventDetails.aspx?id=1754978&group=

**Earth Science Week**
**October 8-14, 2023**
https://aipg.org/events/EventDetails.aspx?id=1699533&group=

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# National EVENTS

## October 2023

**8th-15th: GSA Annual Meeting**
https://aipg.org/events/EventDetails.aspx?id=1712367&group=

## November 2023

**14th-16th: 12th Annual Frac Sand Supply & Logistics Conference**
https://aipg.org/events/EventDetails.aspx?id=1740057&group=

## April 2024

**9th-13th: USA National Women in Mining Conference**
https://aipg.org/events/EventDetails.aspx?id=1750404&group=

**GJGS 2023 William L. Chenoweth Memorial Field Trip**
**Energy and Mineral Resources of the Piceance Basin**
**Aug. 26, 2023**
To attend please contact: rcole@coloradomesa.edu)

**CEMS Fall Conference**
**September 12, 2023**
https://coems.org/events/cems-fall-conference-9-12-2023/

# Colorado EVENTS

## August 2023

**2nd: RMAG August Luncheon**
https://www.rmag.org/index.php?src=events&category=RMAG%20Luncheons&srctype=detail&category=RMAG%20Luncheons&refno=299#ticket_section

**7th: Denver Mining Club Schedule**
www.denverminingclub.org

**15th-16th: Utah Groundwater Conference**
https://agwt.org/civicrm/event/info?id=365&reset=1 )

**15th, 24th: GeoEvents**
15th: www.dinoridge.org/events
24th: https://sites.google.com/view/dmnsdes2020colloquiumschedule/home



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# EMPLOYMENT

**Senior Geologist**
*Murphy Exploration & Production Company USA*
Houston, TX (Hybrid)
https://career8.successfactors.com/career?company=MurphyOil&career%5fns=job%5flisting%5fsummary&navBarLevel=JOB%5fSEARCH&_s.crb=MF%2fPY1Hz%2fTT%2fbDJ70lHCCz9PuKshAbR%2bpMt5MbrLu7c%3d

**Geologist I**
*C.T. Male Associates*
Latham, NY (On-Site)
https://ctmale.applicantpro.com/jobs/2982821-799985.html

**Production Geologist**
*Ur-Energy*
Lost Creek, WY (On-Site)
https://aipg-jobs.careerwebsite.com/job/production-geologist/63212970/

**Environmental Engineer III**
*City of Chicago AIS*
Chicago, IL (On-Site)
https://chicago.taleo.net/careersection/100/jobdetail.ftl?lang=en&job=2073-DAIS-2023

**Environmental Planning Program Manager**
*Terracon*
Phoenix, AZ (Hybrid)
https://careers.terracon.com/job/tempe/environmental-planning-program-manager/37184/45358919104

**Mining Engineer — Senior Level (Hybrid/Remote)**
*Barr*
Salt Lake City, UT
https://barr.wd1.myworkdayjobs.com/en-US/BarrCareers/details/Mining-Engineer---Senior-Level--Hybrid-Remote-_R-100809?q=colorado

**Computational Geologist**
*Leidos*
Remote, VA (On-Site)
https://careers.leidos.com/jobs/13010171-computational-geologist?tm_job=R-00114193&tm_event=view&tm_company=2502&bid=7815

For ALL career opportunities please visit: https://aipg-jobs.careerwebsite.com/

# AIPG Purposes

The purposes of the Institute shall include:

- advance the geological sciences and the profession of geology;
- establish qualifications for professional geologists;
- certify the qualifications of specific individual Member geologists to the public;
- promote high standards of ethical conduct among its Members and Adjuncts, and within the profession of geology; and
- represent, and advocate for, the geological profession before government and the general public.

What AIPG does . . .

- Professional Certification - Certifies geologists based on their Competence, Integrity, and Ethics.
- Categories of Membership - Certified Professional Geologist, Professional, Early Career Professional, Associate, and Student.
- Ombudsman - Intervenes with regulatory boards and agencies on behalf of individual geologists, at the geologist's request. Information also is disseminated in cooperation with the Association of State Boards of Geologists.
- Lobbying - Presents testimony and position papers to Federal and State legislators and agencies on matters affecting geologists and geologists' employment opportunities. Exhibits at the National Conference of State Legislators.
- Liability Insurance - Provides access to insurance for errors and omissions, designed specifically for geologists.
- Continuing Education - Through online learning, publications, seminars, short courses, and field trips, provides educational opportunities for geologists, other scientists, engineers, and the general public.
- Supplemental, Life, and Accident Insurance - Provides access to a full line of supplemental, life, and accident insurance.
- International Comity - Through agreements with professional societies in other countries, provides access for its Members to professional registration, certification, or chartered status in those countries.
- State and Section Activities - State and regional sections work on local political issues and the professional status of geologists in their geographic areas. The Institute's sections around the country hold regular meetings, featuring educational programs covering important subjects of interest to professional geologists. One of the most worthwhile benefits of AIPG Membership is the opportunity to make personal contact at the local and State level; to meet fellow geologists; and to learn from them.



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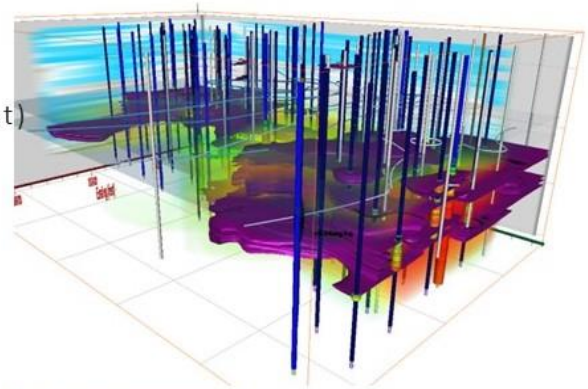
Ground Water Profiler (HPT-GWP)



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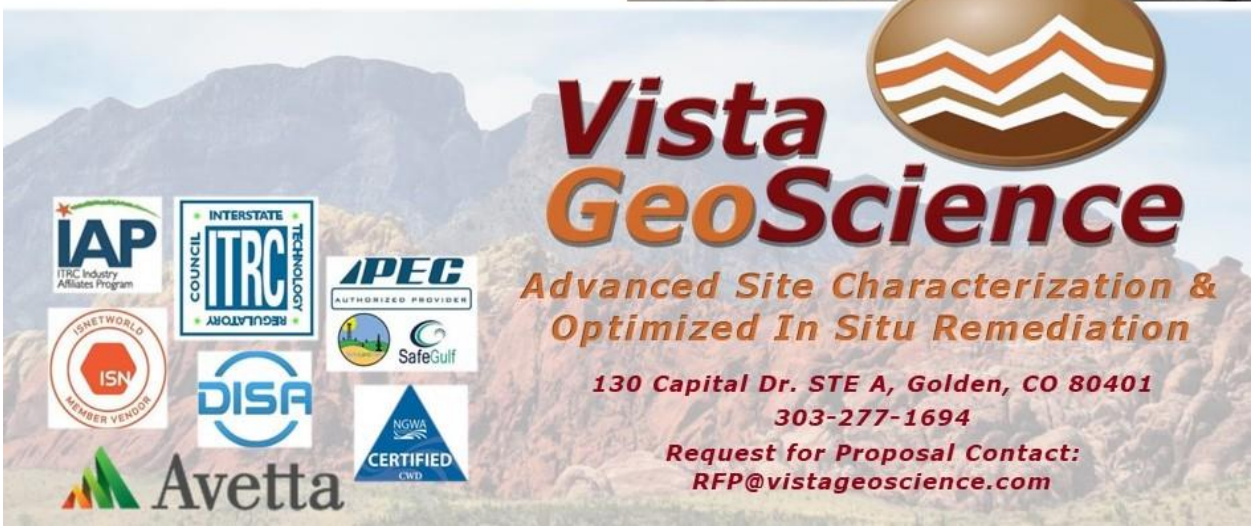
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Soil Gas Sampling/Monitoring
Tier-2 Landfill NMOC Surveys
Stray Gas Migration