THE IUP GEOSCIENCE ALUMNI NEWSLETTER

GeoTidings

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Cover Photo: IUP students in Newfoundland. Photo by Nicole Lees '17

SPRING 2017 Volume 8 Number 1

Our New Science Building Takes Shape

An artist's rendering showing the planned footprint of the new $92M science building. As you can see, it will be adjacent to Oakland Drive and wrap around Wilson Hall.

For those of you wondering about the new science building, here is a brief update. IUP is currently working toward completing it's fundraising goal of $10M in gifts and multi-year pledges for the building in the first half of 2017. During this time the State of PA is offering an 8:1 match for all dollars raised. As early as this coming Fall, the architects for the project may be chosen. They will begin working with the College of Natural Science and Mathematics facility planning committee to design a place that the next generation of geoscience students will prosper in rooms and labs designed to deliver the first rate education we were all fortunate to receive at IUP.

One of our geoscience alumni, **Dan Markey '77**, has recently joined fellow graduate **Tim Cejka '73** as a member of the College of Natural Science and Mathematics (CNSM) Advisory Board. Dan and his wife Linda have recently relocated back to their home town of York, in eastern PA.

Dan commented "it has been an honor to join Tim on the CSMN Advisory Board and work with the other CNSM alumni board members, as we provide guidance and vision for the future benefit of CSMN students, faculty and staff. It has been personally rewarding to return to the campus and meet some of the outstanding science students and have the opportunity to see some of their senior research projects. At this time, Linda and I have made a personal 5 year pledge toward the funding of the new science building. It appeared obvious to me that a new facility was absolutely necessary to continue the longstanding tradition of graduating outstanding scientists from our university".

Dan and Tim encourage all of their colleagues to attend Geoscience Day in the spring (April 28) and Homecoming in the fall of 2017, or to stop by when you are in the area, and visit with Dean Snavely, and chairperson Dr. Steve Hovan. Most importantly, we invite you to meet the future of our industry…the enthusiastic students of IUP.

If you are interested in learning more about personal or corporate support to help our college reach is fundraising goal and keep the project on schedule and as comprehensive as planned, please reach out to Val Higgins, the development officer for the College of Natural Sciences and Mathematics. Your dollars will go a long way, with the State of Pennsylvania match of 8:1. You can reach Val at 724-762-2142 or vhiggins@iup.edu. Val, Tim, and Dan will be happy to fill you in with more details regarding our future home for IUP Geosciences.

Environmental Engineering at IUP

One of the goals of IUP's 2015-2020 strategic plan is to "develop and implement undergraduate and graduate programs in public health, digital science and security, and environmental engineering". The proposed Environmental Engineering program will draw on existing faculty, instrumentation, space, and curriculum resources available in the contributing departments of Chemistry, Geoscience, and Physics. Beginning in Fall 2017, the B.S. in Environmental Engineering will exist as an academic program within the College of Natural Sciences and Mathematics. The program is projected to enroll over 100 students by 2020, when a full Department of Environmental Engineering will be set up in the College of Natural Sciences and Mathematics.

The Environmental Engineering Advisory Board meets with IUP faculty and students in October, 2016.

Under the leadership of Dr. Deanne Snavely, Dean of the College, an alumni advisory board has been created to help organize the new environmental engineering program and provide guidance as it is submitted to the Pennsylvania State System of Higher Education for approval. Five Geoscience alumni have stepped up to serve on this advisory board: **Charles Bove '85**, President and Owner of Vista Environmental Consulting in San Francisco; **Barry Franz '76**, Principal and Owner of Geology Diversified Consulting LLC in the Cincinnati area of Kentucky; **Dr. Barbara Kutchko '97**, Senior Research Scientist at the National Energy Technology Laboratory in Pittsburgh, PA; **Dale Scoff '78**, Geosciences Group Manager at Tetra Tech Inc. in Pittsburgh, PA; and **Steve Zbur '85**, President and Owner of CORE Environmental, Pittsburgh, PA.

Several other concrete steps were taken toward achieving IUP's environmental engineering goal in 2016 with the hiring of the first two program faculty: Dr. Hao Tang in the Department of Chemistry and Dr. Sajad Hamidi in the Department of Physics (see in-depth profiles of these new faculty on pages 4 and 5). Dr. Tang has his doctorate in Environmental Engineering from Penn State University and is a registered PE (Professional Engineer). Dr. Hamidi holds a doctorate in Civil Engineering from Tarbiat Modares University. Dr. Hamidi has worked as an environmental consultant for eight years and is also a PE. These new faculty members are joined by a strongly qualified group of current faculty who will deliver the science and math courses required in the engineering program. A third environmental engineering faculty member will eventually be hired into the Geoscience Department. These members will oversee the day to day operation of the academic program that will eventually form the nucleus of the future Department of Environmental Engineering at Indiana University of Pennsylvania.

IUP Welcomes Two New Engineers

Dr. Hao Tang Joins IUP Faculty

IUP is going to launch a new environmental engineering program from spring 2018. I am one of the two newly hired faculty members for curriculum development of this interdisciplinary program. My research is at the interface between environmental engineering and chemistry, focusing on chemistry principles and chemical processes for effective water and wastewater treatment. Therefore, I am currently housed in Department of Chemistry before any engineering department is established.

Before joining the IUP faculty, I was actively involved in various environmental industry settings in Minnesota as a registered professional engineer and was experienced in design/build projects of prefabricated steel/concrete packaged water/wastewater treatment systems for small industrial users. The Minnesota license plate of my SUV is “DR H2O”, indicating I am committed to provide solutions to my clients’ water problems. As a Chinese national, I completed my master’s and doctoral degrees in environmental engineering in United States at Pennsylvania State University. Pennsylvania is my second hometown and I have spent quite a number of years here. When the opportunity of returning to the state I loved popped up, I accepted the job offer without any hesitation.

During the past school semester, I taught General Chemistry and Environmental Chemistry at IUP. I’m passionate about teaching and sharing my practical engineering experience with our next generation of environmental specialists. I’m also developing a research group consisting of IUP graduate and undergraduate students and high school students from Indiana Area Senior High School. As shown in the photograph, I took my students to a local acid mine drainage (AMD) site to identify the ideal sampling sites for water quality analysis. The project was to study the effectiveness of the existing treatment processes at the AMD site for removing undesirable pollutants.

Dr. Hao Tang (left) brought his IUP students to a local acid mine drainage site near Tanoma PA this fall to collect samples for water quality analysis.

Besides, my current research interests include water desalination technologies, water disinfection and disinfection byproduct control, and biological nutrient removal from wastewater. I’m working hard toward the goal of establishing an externally funded research program. Recently, my research, in collaboration with Penn State, is funded by Pennsylvania Water Resources Research Center to investigate the impacts of oil and gas extraction on downstream water utilities, as the leaching of bromide – a carcinogenic disinfection byproduct precursor may pose a hazard to downstream drinking water supplies. As our group steps on the right track of delivering high quality research, I’m expecting more exciting news from funding agencies.

IUP Welcomes Two New Engineers

Dr. Sajad Hamidi Comes Aboard

Dr. Sajad Hamidi (left) deploys ADCP equipment in Green Bay of Lake Michigan to measure hypoxia.

I have joined College of Natural Sciences and Mathematics this fall. I am here to help the college to start new program, Environmental Engineering. I have been working in recent years as a postdoctoral researcher and instructor at University of Wisconsin Milwaukee (UWM). I got my undergraduate and graduate degrees in Civil and Environmental Engineering.

While I was a graduate student during my Master's and PhD program, I worked as an engineer in several engineering and consulting companies. My responsibilities as an engineer were design of hydraulic structures, river engineering, hydropower plants, and water resources engineering. During my Postdoctoral program at UWM, I carried out research projects in environmental fluid mechanics, physical oceanography, biogeochemical modeling in Great Lakes, water resources engineering, environmental engineering, and anthropogenic influences on natural waters.

One of my current research interests is to develop hydrodynamic and pollution transport models in lakes and coastal regions. Roughly twenty percent of our planet's water lies within the Great Lakes watershed. These lakes supply over 33 million people in the United States and Canada with the water they need for life. Unfortunately, this precious water is often polluted in a variety of ways, such as high load of nutrients, bacteria, and other land based pollutions. For example, hypoxia conditions have plagued the lower part of Lake Michigan's Green Bay and the Fox River for decades. The computational models give us the ability to predict how changes in nutrients, runoff, oxygen levels, and watershed land use, as well as climate change, will affect the size and impact of the hypoxic zone. I have applied these computational efforts, in addition to field works, to address hypoxia in Green Bay, water quality near Milwaukee, and climate change effects on water resources and water quality in the future.

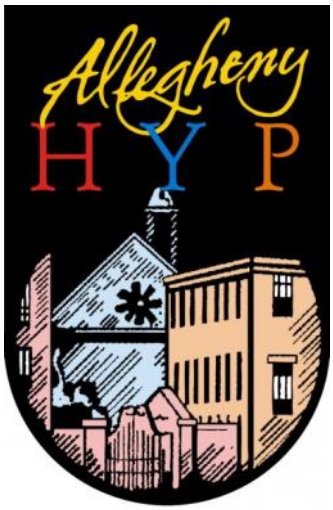
Water conditions in the lower part of Green Bay can actually be seen from space.

I am very excited to be a member of the IUP family and I am pretty sure we will have an environmental engineering program up and running in the near future.

2017 IUP Geoscience Events

March 20, 2017

IUP Alumni Get-Together at the Northeast-North Central Geological Society of America Meeting in Pittsburgh



We decided to throw a party for IUP Geoscience alumni during the GSA section meeting. Catch up with old and new professors, meet our current students, and network with fellow alumni. You don't need to be registered for the GSA conference to attend! Just drop by Pub Room of the **Allegheny Harvard-Yale-Princeton Club** (across the street from the GSA meeting hotel) from 5-7 PM on March 20.

April 28, 2017

43rd Annual IUP Geoscience Day and Banquet

The annual celebration of IUP Geoscience student research will be held on the last Friday, April 28, of the spring semester. We expect to have fifteen seniors presenting their capstone research projects during the morning and early afternoon, with a featured alumni presentation to follow.

In the evening, the Geological Society of IUP will once again sponsor the annual Geoscience Banquet at which graduating seniors and other outstanding students will be honored with awards and scholarships. As always, our alumni are welcome to attend the celebration with us. We hope to see you there!

May 19-20, 2017

50th Anniversary of the IUP Planetarium

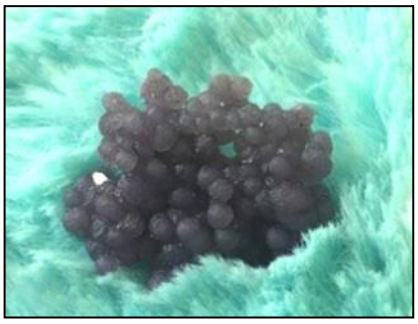
Can you believe it's been half a century since the IUP Planetarium was first opened to visitors? To celebrate this landmark, Dr. Ken Coles, the Planetarium Director, is hosting a meeting of the Mid Atlantic Planetarium Society on **Friday, May 19** and presenting a public planetarium show on **Saturday May 20** with a solar viewing afterward to get everyone ready for the sight of a lifetime: the total solar eclipse which will cross the U.S. this coming summer. We are also planning a special observance of the anniversary during this week, and hope to see lots of past students and friends there, including Professor Emerita Connie Sutton.

IUP Student Research Spotlight

An Investigation of Grape Agate by Nicole Camarda '19

Editor's Note: For this issue of Geo-Tidings, we're highlighting research done by one of our freshmen majors during her very first semester in the program. She pursued this research project entirely on her own after purchasing an interesting mineral sample at the Geological Society of IUP annual mineral sale .

Nicole's grape agate specimen



My original research questions were: Is grape agate a real mineral or man-made? If it is a real mineral, where is it found and how is it formed? As I continued to do research, I added two other questions: What is grape agate's real name and how can you determine real from fake specimens?

The first observations I made on my specimen revealed a white streak and conchoidal fracture, with a hardness of 6-7 on the Mohs scale. That suggested it was SiO_2, but its dull and waxy luster seemed unusual.

My next step was to do a reverse image search on the internet. Unfortunately, it just came up with pictures of cells, ants, and actual grapes. Researching the name 'grape agate' directly was the most successful form of research. Grape agate seems to originate mostly Sulawesi Island, Indonesia, according to sellers of this mineral on the internet, and it appears to form from volcanic activity. Some other names it goes by are Manakarra stone (a native rock from Sulawesi Island, Indonesia), purple chalcedony and Suiseki chalcedony (this term comes from the hobby of Bonsai growing).

Chalcedony is not scientifically its own mineral species, but rather a form of quartz in microcrystalline form. I also looked up amethyst and discovered that it could take on a botryoidal form if it grew with large radial crystals. On the mineral forums I read, experts couldn't decide if grape agate should be called botryoidal amethyst or chalcedony, but they did state that many fake samples of this mineral were circulating.

Botryoidal amethyst

My conclusions are that "grape agate" seems to be a misleading name. What I believe that it actually is, is botryoidal amethyst formed volcanically, if it is in fact from Sulawesi Island, Indonesia. Similar to my sample, amethyst has a white streak and a 6-7 hardness. Examples of this mineral formation also come from Hungary and I have included a photo of an example that was found there. This type of amethyst is formed from silica gels at low temperatures, making it waxy and almost translucent.

Although this is a rather odd formation they are genuine and it is a relatively new find (within the last 5-10years). I would say that there are far more fakes going around then genuine grape agate due to the shortage of supply and as result, a high price. Genuine botryoidal C\chalcedony is rather expensive. The chance of finding a cheap genuine specimen of good size is slim. Fakes are polished or have evidence of a tool used to carve the stone. Questioning the authenticity of my sample, I can say that there are many factors that would lead me to believe that mine is genuine. The color isn't overly brightened, it isn't overly smooth, it's dull and waxy in luster, and the streak/hardness matches that of amethyst. My specimen, no more that 1in x 1in, was $5. Larger pieces (~5in x 2in) were $15. Assuming that the samples that were bought by our Geo Club for sale were a lower grade than those sold normally, the price would be consistent of that with genuine samples. Perhaps in the next few years more information will be available to solidify my interpretation or disprove it.

Bob Kervin ’02 Receives 2016 IUP Young Alumni Achievement Award

The Geoscience Department congratulates **Robert Kervin ’02** on receiving one of six 2016 Young Alumni Achievement Awards from IUP this past fall. These awards were created to recognize recent IUP graduates identified as being outstanding in their fields and to bring these alumni back to campus to inspire our IUP students as examples of the kind of professional achievement they can aspire to.

Bob is executive vice president and co-founder of Rusk Energy Corporation. Bob has served as a geologist for multiple companies in the energy industry and is currently recognized as a leader in developing new technologies that extend the lifespan and production of conventional oil and gas fields.

It was great to have Bob back on campus and in the department for the day. He took the time to meet with both faculty and students to talk about his current work and to pass along advice to students who will be entering the workforce soon. Bob gave students great tips on networking with fellow alumni and students, and on learning how to see new opportunities in geologic situations that have been written off by others as useless.

As with all geologists, there were also the requisite stories about time spent in the field near and far. We particularly enjoyed the stories involving falling rocks and undergraduate pack mules from his undergraduate field research with John Taylor.

Bob Kervin (back row, second from right) and his fellow Young Alumni Achievement Award Winners received their honors from IUP President Michael Driscoll this past fall.

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John Repetski ‘69

I'm still stalling off retirement from USGS, IE, they're still paying me and there's still so much to do. Oh yeah, and it's still satisfying to find that new fossil and to get a first dating of that outcrop.

Active projects are on the stratigraphic framework and thermal maturation patterns of the Marcellus and Utica Shales; on the Cambrian-Ordovician Jones Ridge Formation in easternmost Alaska (with John Taylor and others. John and I need the conodonts and trilobites to confirm each other's biostratigraphy!).

I’m also continuing work on Midwest and western Great Basin work with various USGS and academic colleagues. As with Dr. Taylor, I did not run a marathon in 2016 (but intend on correcting that in 2017).

Tom Moore ‘76

T. R. Moore had a fun Spring semester teaching the second go-round of Geology of Oil and Gas for IUP Geoscience Department majors, then over the summer building an Energy Geology course for non -majors, which was even more fun to teach in the Fall semester of 2016. That fun was partially offset by the long-distance commuting from the “farm” in Waynesburg and the more civilized house in the North Hills, but hopefully worth every mile in results, even if more questionable in terms of energy return for energy invested. Just chalk it up to doing his part for global warming, along with a coal-fired stove in the “farm” house.

Muffie continues long-term, in-home care for her mother, which essentially consumes all of her time and energy. Son Duane continues his career as a flight test engineer for Bombardier in Wichita, KS and daughter Aileen works in the trust department for Arvest Bank in Lowell, AR, mostly looking after money of early investors and employees of WalMart.

Reid Rosnick ‘78

Reid Rosnick ('78) retired this past March. He worked for over ten years as hazardous waste permit writer for the Maryland Department of the Environment. He then spent the remainder of his career at the US Environmental Protection Agency. As a senior hydrogeologist he helped regulate the Waste Isolation Pilot Plant, was the hydrogeologist for the Agency in writing the rule for the Yucca Mountain nuclear waste repository, and ended his career with regulating the uranium mining industry. He also found time to take a five year hiatus playing "Mr. Mom" to his three children. He currently lives in Alexandria, VA, waiting for his wife to retire, so they can move closer to the ocean.

Andrew McKinnon ‘78

After graduating with a BS in Geology in 1978 I worked in oil and gas until 1988 (geologist for Equitable Gas in Pittsburgh and potential fields exploration for Amoco and others in many western states). I worked in hydrogeology from 1988 to 2000 for Meiser and Earl in State College.

I quit my job as a hydrogeologist in 2000, got a BA in Psychology in 2003 from Penn State and a Masters in Social Work in 2007 from Temple, and have been a mental health therapist ever since. I now have a private practice in State College as a Licensed Clinical Social Worker.

I have a wife Janine, who also attended IUP for two years before graduating from Community College of Allegheny County with an Associate Degree in Nursing. I also have two daughters, Leela, 25 and Malti, 22.

I no longer practice geology but maintain a connection to it as an active caver. I've been a member of the National Speleological Society for over 40 years and the Nittany Grotto for about 23. I mostly cave in PA but also visit caves in more southerly Appalachian karst. Typical trips include a

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recent one to a couple of vertical caves in Alabama and Tennessee (War Eagle Cave and Cagles Chasm, respectively), and another trip to Burnsville Cove in Virginia (Butler Cave).

Terry McConnell ‘80

Last spring break took the geology Club of UPJ to Iceland for the geological trip of a lifetime. It is the land of geothermal energy, basalt columnar joints, black sand beaches, waterfalls, geyers, glaciers, hot springs and skyr. We're fortunate enough to ferry to the volcanic island of Heimaey that erupted in 1973 . If anyone is interested in the guidebook of our trip contact me. Look close, that's me in the center of the North Atlantic rift.

Paul Hale ‘94

The company I have been running since late 2011, L.G. Hetager Drilling, Inc. has succumbed to the accumulating forces of steep market contraction, commoditization, and national energy policy. I was informed in early January that our corporate parent company had decided to divest of the Hetager entity. We laid off most of the 35 people we employed in February, and the remaining skeleton crew mid-July. Hetager was founded in 1952, and I think we will be missed in the geotechnical and coal exploration drilling world. At present I am the only employee, and am overseeing the last bit of asset liquidation remaining.

In March, I was presented with an opportunity to lead a specialty construction company, GeoBuild, LLC. I am currently GeoBuild’s President and oversee anywhere from 6-14 field crew comprised of union laborers and operators. The company is focused on landslide repair- employing soil nails, rockbolts, shotcrete, micropiles, and drilled shafts to address these geohazards for both private and public owners in Ohio, Pennsylvania, Maryland, and West Virginia. GeoBuild offers additional services ranging from dam concrete repair to mine stabilization grouting depending on client need. I am particularly glad to have been able to bring a small group of former Hetager drillers over to GeoBuild. Their expertise allows GeoBuild to offer geotechnical subsurface drilling and testing services to selective clients, particularly dam owners.

As alluded to above, I am active in the Association of Environmental and Engineering Geologists. The AEG had a very well attended 2016 Annual Meeting in Kona, Hawaii this September. The landscapes were breathtaking

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and I was fortunate to attend with my wife and son. My daughter would have attended as well, were it not for being neck deep in honors college classes at Penn State in her freshman year. From swimming in 90 degree weather at the coast, to freezing my butt off at 12,000 feet atop Mauna Kea', it was an adventure of a life time. I have attached a picture of the latter.

Mike Cypcar '97

My wife (Stacy) and I still live in Northern VA. Our (2) kids are now 10 and 6. I have been supporting the .com/.net infrastructure for the last 10 years so work is really meaningful.

We took the kids to Hawaii this summer to see a real volcano. Didn't get to see any lava.....just "boring steam coming out of the crater" according to my 6 year old. I got a little carried away with the GoPro: https://youtu.be/sT9xiTYVCjI

Barbara (Osgood) Kutchko '97

I am the new managing editor for the American Association of Petroleum Geologists (AAPG) Division of Environmental Geosciences "Spheres of Influence" newsletter. AAPG is a prominent scientific community that exists to enable geo-scientists in their research pursuits. The newsletter keeps members of the Division of Environmental Geosciences informed on the latest current events in the field and encourages the communication that fosters scientific breakthroughs. I encourage all of my fellow colleagues, professors, and friends to submit articles or images for publication in the newsletter.

I was also recently was one of several women in Pittsburgh selected by the Pittsburgh Business Times to receive a 2016 Women in Energy Leadership Award.

Heather Renyck '99

Time flies! It seems like yesterday that Jim and I attended Geoscience Day Banquet to honor the student presenters/researchers and Dr. Taylor's retirement! It was wonderful seeing some of my favorite people who I hadn't seen in a long time.

I'm still teaching Earth & Space Science and Environmental Science to high schoolers in western NY. One of the past year's highlights for me was visiting the Azores (Portugal) archipelago which was formed at the triple junction of the N. American, Eurasian, and African Plates. I've always wanted to go to Iceland, but the price was right for the Azores. Jim and I flew out of Toronto - a straight shot to the Azores. We spent a few days on Sao Miguel, currently the most volcanically

active of the islands. We enjoyed the hot springs and the hikes along the dormant craters of Lagoa das Sete Cidades and Lagoa Fogo. I even got to see a few new bird species (for me) - like the Atlantic Gull (Yellow-legged Gull) which nests at Lagoa Fogo.

From there we flew to Pico, as we wanted to hike Volcan Pico. The day we landed, it was a beautifully sunny, clear day. Volcan Pico is the prominent feature of the island. We arrived too late to ascend. The following days, we were completely socked in. We went on a whale watch instead, as the whales are prolific due to the upwelling. We got lucky and saw sperm whales and humpbacks.

Being there on the off season was really nice, but sometimes the locals let their guard down as a result I suppose. For example, we got locked in the local winery. We saw a man leave and lock the gates. We figured he saw us and was coming right back, but no... Had there been wine readily available, we would have been happy to spend the night. Instead, we had to scale the rock walls to get out. That was memorable!

We only spent a day and a half on Terceiro, but it was enough for us to decide to go back. I think we will return in the spring with the goal to spend the entire time on Pico in order to get one good day to hike it. One can take a ferry to neighboring Faial and San George, so there would be plenty to do.

Steve Smith ‘01

Another year has flown by rather quickly, but it has been a good one. We are all doing well, though I badly sprained an ankle back at the end of July that is just now starting to feel better. My daughter, Aurora, is progressing in fourth grade at Porter Traditional School. She has been struggling a little more this year, but there are still three more grading periods to improve. She is excited for her field trip later in April 2017 to Jamestown. We took the trip there in 2015, so she gets to go learn more about Virginia’s first English settlement.

Since April 2016, my wife, Kate, left her cafeteria hostess position at Potomac View Elementary to become a temporary special education aid at Leesylvania Elementary School. She is tasked with assisting a non-verbal autistic student in his daily learning. She also assists with some of the other kids in the class when needed. She is still involved with Girl Scouts as one of the assistant leaders for the troop of Junior Girl Scouts that Aurora is in. Kate is still the cookie mom.

I attended the retirement of Dr. Taylor at the end of April. Great time! It was great to also see my fellow alumni, Bob Kervin. As for the rest of the year, I have continued to do some Civil War reenacting and living history events with his group, the Liberty Rifles. This year had a very busy living

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history schedule, but a reenactment at Perryville, Kentucky was also added to the fun. The Honor Flights have also been a staple for the yearly activities. There was even a couple new items to participate in as the family went on Veteran's Day to send off wounded warriors and their families to Las Vegas, Nevada as part of Gary Sinise's and MGM's events. December 11, 2016, was also the send off for children of those killed in action in Iraq and Afghanistan to Dallas, called the Snowball Express. This coming weekend the family will participate for the first time in the Wreaths Across America by going to Arlington National Cemetery and helping to lay out the wreaths. Not much new at NGA to speak of.

This year, the family finally got back into the big vacation. Most of July was spent driving out west to see: Jasper and Banff National Parks in Alberta, Canada; Glacier National Park, Montana; Pompei's Pillar National Monument, Montana; Little Bighorn National Battlefield, Montana; Devil's Tower National Monument, Wyoming; Several State, local and National Parks and Monuments in the Black Hills region of South Dakota; Badlands National Park, South Dakota; Field of Dreams in Iowa; and a Cubs-Mets game at Wrigley Field. Aurora is now up to 39 states and the District of Columbia, as well as three Canadian Provinces.

I'm currently planning the coming year's vacation to Yellowstone National Park and Grand Tetons National Park. It should be another fun adventure for the family. Aurora may get her 40th state out of the trip, as we will likely head into Idaho for a day, and I'll show her where I gathered field samples for my IUP Senior project at Craters of the Moon National Monument.

We also gained another addition to the family in September. No not a kid, but a puppy of 10 months, who has since turned 1 in November. His name was Mickey, but we went with a Pirates flair and named him Jolly Roger! He is likely a Rat Terrier with a possible mix of Jack Russell Terrier. He loves to hop when he is excited. We adopted him from Animal Friends of Virginia. They had taken him in from a kill shelter in West Virginia. We are still in the process of trying to train him better, but he has been a good dog otherwise. Aurora hope he starts to warm to her as much as she has to him. Finally, have a safe and happy holiday season, and we hope that 2017 is a good one for everyone.

Joe Biondo '07

I am still working in the Oil and Gas industry in the WV, PA, OH region with the Marcellus and Utica shale layers. I am the Regional Environmental, Health and Safety Manager for Pilot Thomas Logistics. The company delivers fuel, lubricants, and various chemicals to drilling rigs, frac locations, and compressor stations. I managed to

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survive the recent downturn in the industry and am looking forward to the increase in production predicted in 2017. In my personal life, I have a 1 1/2 year old daughter and a son on the way in April. The picture is of me getting ready to do an inspection on a frac pad for a customer.

Jeff Dereume ‘08

I continue to work for EQT corporation in Pittsburgh Pennsylvania as the geology team leader for our West Virginia subsurface assets. Regardless of the energy downturn this year, we have been busy at EQT with the acquisition of nearly 125K acres throughout Pennsylvania and West Virginia. We are working to efficiently develop the Geneseo and Marcellus shales, and actively delineate the Utica shale throughout the basin. Achieving great success as a business unit, EQT became the fifth largest gas producer in the United States.

On a personal side, I continue to work away at my MBA program at Robert Morris University, and should be done with the program within the year. I took a brief hiatus as my wife Kathryn and I welcomed a daughter, Evie Inez Dereume on September 10, 2016.

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Stephen Norair ‘12

Since graduation I have been quite busy, considering I have neglected to post an update since graduation four years ago. My return to geoscience started in 2013 after a year and a half of working in the unrelated field of mortgage banking. Oil was still hot, so I packed my bags and moved west to Midland Texas to work as a Mud-logger in the Permian Basin. I learned a lot out in the oil patch and have fond memories. It was probably the best time I’d never want to have again.

With the help of Katie Farnsworth, I began applying to graduate schools and was accepted with full scholarship at Baylor University in the Fall of 2014. Studying under Dr. Peter Allen, I enrolled in the field of Fluvial Geomorphology. My thesis was entitled “Streambank Erosion Assessment: Application of Dendrogeomorphology, Numerical Watershed Modeling, and Model Characterization”. This research used a method that takes advantage of anatomical changes that occur in exposed true roots on stream banks to estimate channel erosion. We then used the Soil and Water Assessment Tool (SWAT), a watershed model, to make evaluations of two watersheds in Central Texas. I have presented our research at several conferences and society meetings since then and hope to publish this research in the near future.

Since completing my masters in the Spring of 2016 I have been hired by the engineering firm Freese and Nichols, where I am a practicing geologist in Fort Worth, Texas. My work is still primarily concerned with fluvial systems and I regularly work on projects that entail stream assessments for the purpose of protecting infrastructure or determining the impacts of human development. While I have grown and changed a lot, I will never forget my time at IUP (especially Caz Bejger’s illustrious hair).

Sage Wagner ‘14

In the high elevations of an Andean valley, an eager native tongue calls out to me. “Disculpe, dónde está el baño?” I pause my office commute to reply “uhhh, perdón, yo hablo poco español, mas esta….” and point a freshman student to a recently built unisex bathroom. “Oh, it’s OK! I speak English, too!” he proclaims as he finds his way around an old sugarcane plantation, retrofit into Ecuador’s research-focused, Yachay Tech University.

On assignment in the “Ciudad Del Conocimiento” (City of Knowledge), I juggled many research tasks and university contributions during my second year of graduate school. Concluding my trip to Ecuador, I completed a master’s degree at East Carolina University and also successfully transported and built two research-grade “super-computers” for the future geoscience students of a

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developing country. Working with my graduate advisor, I had the very good fortune to travel to three different countries in South America, to be quoted in Science Magazine ("I think we are in luck!"), and to gain a new-found perspective on life with some of the most passionate, genuine people I've ever had the chance to meet.

The featured Science article in which Sage is quoted:

http://www.sciencemag.org/news/2015/10/feature-how-amazon-became-crucible-life

The foothills of the Peruvian Andes are home to some of the most diverse cloud forests in the world.

Feature: How the Amazon became a crucible of life

By Lizzie Wade | Oct. 28, 2015 , 4:30 PM

Trudging along the bank of a shallow creek in the Peruvian Amazon, Catherine Rigsby sinks knee-deep in mud. She calmly shimmies out of the muck, then grabs a branch lying on the bank for a walking stick. As stingless bees buzz around her head and macaws screech in the trees above, the sedimentologist gingerly resumes her search for a rainforest rarity: exposed rock. One of the few outcrops in this corner of the Amazon—a day's boat ride up the Manú River from the nearest town—is around here somewhere.

"I think we're in luck!" Sage Wagner, Rigsby's graduate student, calls from around a bend in the creek. Catching up, Rigsby, who splits her time at East Carolina University in Greenville and Yachay Tech University in San Miguel de Urcuquí, Ecuador, faces her quarry: a modest wall of sediment, about as high as she can reach. Deposited layer by layer some 9 million years ago, the outcrop holds clues to an enduring riddle: What gave rise to the Amazon rainforest's staggering biodiversity?

A little bit of luck, passion, hard-work, and humility, brought me floating down a full-day boat ride along the Peruvian Madre de Dios River with our Andean/ Amazonian research group. Finally approaching a deeply weathered, vegetation-covered outcrop, the fact that so little is known about the evolution of the Amazon River became more apparent. Honing in on my sedimentological skills which originated in Dr. Taylor's Sed/Strat class, my observations of fluvial sedimentary structures contradicted a previous claim that the exact outcrop holds information regarding a proposed Miocene marine incursion.

Prior to my excursion into the Peruvian jungle, I had the opportunity to work out of a Brazilian university, providing a necessary subsurface framework for a proposed ICDP trans-Amazon drilling project aimed to recover ~1 km of Cenozoic sediment in the Brazilian Amazon. These learning experiences were very fulfilling; however, my greatest take-away from these experiences was an appreciation for other culture's food, music, festivities, and bilingualism. My life-long obsession in the martial arts brought me to an all Portuguese-speaking Brazilian Jiu Jitsu (BJJ) academy, a small dojo in the heart of where BJJ originated. It is truly amazing how the physicality of attempting to isolate and control your training partner's body movements, breeds a friendship that is everlasting. Not all of my new friends were able to speak my language, but we shared the language of Jiu Jitsu. From my first day of training, I walked into this small dojo in the North Zone of Rio de Janeiro as a gringo, but left as a Carioca (native of Rio) with 30 of the most savage, yet most humble, brothers and sisters that I have ever met.

From the lucky to the misfortunate, from the happy to the sad, and from the fulfilling to the detrimental, these experiences have led to my growth as a young scientist. These experiences were very empowering and attest to the greatness of pursuing geoscience research in graduate school, as before any of these endeavors I hadn't even left my home country for a family vacation. And yet, this is just the beginning of my journey.

David Watkins '14

2016 has been a busy year for me. In the spring I finished my master's in geophysics at the University of Wisconsin, using seismic tomography to study the Rivera Subduction Zone. I decided against going into a PhD for now at least, and in June I

Alumni News

started a contractor position at the USGS Office of Water Information, outside of Madison, in the data science team. Things have been going well, and I have accepted a federal position at OWI starting after Christmas.

In between the end of the semester and starting work I escaped for a quick trip to the Porcupine Mountains on Lake Superior with my girlfriend Hanna. Lots of neat bedrock stream channels! Attached is a picture looking up the Presque Isle River near its mouth.

Jeremiah Thomas ‘15

I am still in my first year with the Naval Oceanographic Office and am working on a variety of hydrographic and bathymetric products for the Navy and the National Geospatial Intelligence Agency. I recently went on my first deep water bathymetry survey in the Atlantic and attempted to represent our department in the old styrofoam pressure experiment (see the photos).

We sunk the skull down with a CTD probe to about 5000m.

After the Christmas holidays I will be heading into the Pacific for a multi month hydrographic survey as part of our continuous survey operations for safety of navigation and improving nautical charts. If anyone is interested, the Naval Oceanographic Office is hiring recent graduates (we like geology degrees) through the DON Pathways Program, for Oceanographer and Physical Scientist positions. They can email me if they have any questions about working for NAVO. I also encourage students in need of funding (who isn't?) and who would like to work for the Department of Defense, to check out the SMART program at https://smart.asee.org/.

Zach Spangler ‘15

After six months of searching and interviewing for full-time positions in Pennsylvania and Northern Virginia, I have recently been offered and accepted an 8th Grade Physical Science position at Eagle Ridge Middle School in Ashburn, VA. I'm very excited to move down there in August and finally start my teaching career

Amanda Kirka ‘16

I got a job offer (and accepted it)! I will be teaching 9th grade earth science/environmental earth science at Brockton High School [Massachusetts] this school year! Brockton High School is in an urban setting, however the school is pretty amazing. They have over 4,300 students, numerous national awards for their academic excellence, a brand new planetarium system, and some pretty great athletics as well.

This was the same school that Rocky Marciano attended back in the day, and the school colors are the same as my alma mater.

Faculty News — Karen Rose Cercone

Karen Rose started 2016 teaching Carbonate Geology during the three-week winter term. Taking a group of enthusiastic IUP students on a field trip to the Florida Keys proved to be a great way to beat the post-holiday blahs.

After that, KR spent a lot of time thinking about introductory geology labs. She helped teach the GEOS 201 majors lab with Nick Deardorff in the spring, then worked all summer with Dr. Jon Lewis to revise and re-format the 201 labs for fall. One great addition was a field journal writing assignment at the end of each lab, to get introductory students thinking about what field evidence to focus on when making observations.

Along with Dr. Greg Mount, Karen Rose revised the GEOS 102 labs over the summer of 2016 to add in more environmental topics of interest to non-major students, while still keeping traditional elements like minerals, rocks and geologic maps. The students enjoyed finding out about their local soils, flood risks and radon levels, but it would have probably worked even better if the new work-station I-Pads hadn't distracted them into taking selfies when they were supposed to be looking up mineral properties.

The most exciting research news of 2016 for Karen Rose came thanks to the Chemistry Department, which invited her to participate as an assessment specialist on a grant-funded project to create a new minor program at IUP. The proposal submitted by Dr. Justin Fair and Dr. Anne Kondo was awarded $663,835 from the NSF for their project, "Better Preparing STEM Graduates for Employment: An Interdisciplinary, Problem-based Approach for Teaching and Assessing Teamwork and Interpersonal Skills." The $663,835 award is one of the largest research grants ever received by IUP.

IUP alumni Pat Federinko '86 and Gary Ball '78 joined Karen Rose for a pre-FCOPG field trip on the geology of the former Pennsylvania Canal.

This past fall, Karen Rose helped out with the recent Field Conference of Pennsylvania Geologists which was headquartered Indiana County. Along with **Gary Ball '78**, she led a pre-conference trip to Saltsburg and Tunnelton PA to look at the geology and history of the Pennsylvania Main-Line Canal in the area around Bow Ridge.

KR continues to serve on the board of the Pittsburgh Geological Society (along with IUP alums **John Harper '68**, **Brian Dunst '82** and **Diane England Miller '88**). She and Gary will run another trip to Bow Ridge for PGS members this coming April. Karen Rose will also chair a K-12 educational session on climate and energy with Ken Coles at the upcoming NE-NC GSA section meeting in Pittsburgh this coming March and hopes to see some IUP alumni there.

In between teaching, grant-writing and student advising, KR found time to travel to the Pacific Northwest this spring. She also continues to train and show her young border collie, Mica, in obedience and agility trials. As you can see from the photo, he is much faster than she is!

Karen Rose and her 'metamorphic' border collie Mica represent IUP Geoscience at a recent agility trial.

Faculty News — Steve Hovan

This year Steve Hovan continued to plug away at several projects in his lab and in the field. Students Nicole Kelley and Becky Haase have been busy extracting dust samples from cores taken during the Knorr expedition to the central Atlantic Ocean. Some early work on these samples showed exciting results that documented a major strengthening of trade wind strength with the first onset of northern hemisphere ice ages during the Pliocene. This summer, Steve plans to devote time to writing up these results and preparing samples for isotopic analysis.

This year Steve started a new project in collaboration with the PA Department of Environmental Protection and the U.S. Environmental Protection Agency to examine the air-quality and particulate matter concentration at a couple of locations near campus. With help from students Rachael Krueger and Gabriella Zuccolotto, we've been collecting a continuous suite of air-quality gas concentration data, meteorological data, and <2.5 μm particulates to identify the important emission sources in the area and to document the impact of "scrubber" devices installed on nearby power plants.

View of Indiana, showing both the Homer City Power Plan and IUP Cogeneration Plant stacks.

Finally, Steve has continued to work with the Energy Research Cluster to identify the flux of methane to the atmosphere produced by wetlands (working with Greg Mount) and by venting from legacy gas and coal-bed methane vent pipes. Working with faculty and students from the Department of Geography and Regional Planning, the Energy team has been trying to locate abandoned plugged wells in Indiana County to measure any direct leakage of methane through and around the well casing. Molly Rudolchick and 3 students from Indiana H.S. Science Club have collected a terrific set of high-resolution flow-rate data that documents variability at one particular plugged well site that vents 2000-3000 cm3 of methane per minute. Molly has also collected discrete gas samples for stable isotopic analysis to help identify the source of methane and will be presenting her results at the NC/NE Sectional GSA meeting in Pittsburgh this Spring.

Molly Rudolchik measuring gas flow emissions from an abandoned well.

Last summer, Steve completed a 3-yr term serving on the Science Evaluation Panel for the Integrated Ocean Discovery Program. It was exciting to take part in the discussions, evaluation and development of expeditions to be drilled by the IODP programs, but the travel was a bit exhausting. Steve is looking forward to staying closer to home this year… unless of course, an opportunity to go out to sea should happen to materialize!

Faculty News — Jon Lewis

Jon Lewis and Team Tecto continue to make steady progress on a number of research projects. Jon was fortunate to secure PA State System of Higher Education (PASSHE) funds through the Faculty Professional Development Committee (FPDC) to support a 1-semester sabbatical in Spring 2016. He spent a couple of weeks at UConn developing a strategy for field work in Taiwan, then headed to Taipei for a 3 month visit to Academia Sinica (AS). His host at the Institute of Earth Sciences (IES) at AS was Dr. Jian-Cheng Lee. In addition to continuing his work on normal faulting in the southern Central Range, Jon and Jian-Cheng were able to collect preliminary data in support of a new proposal to the National Science Foundation (NSF). The project would involve bringing 3 IUP students to do fieldwork with 3 Taiwanese undergraduates and U.S. collaborators in eastern Taiwan during two consecutive summers. The work on normal faulting included collecting new data as well as new samples that collaborator Dr. Chih-Tung Chen is analyzing for peak temperature using Raman spectroscopy. Sampling in Taiwan is difficult and Jon had to enlist the help of two professional porters and two National Taiwan University graduate students for a 4-day adventure to the Dalun River, which we had to cross several times. They were fortunate that the weather cooperated.

Jon and colleague Jian-Cheng Lee along the Soufeng River in eastern Taiwan during his recent sabbatical.

This ongoing work was the subject of a talk given by senior Allie Berry at the American Geophysical Union (AGU) meeting in December! This was the third undergraduate talk at AGU by a member of Team Tecto. Allie also proudly represented IUP with a poster presentation at the 2016 Annual Meeting of the Geological Society of America in Denver this Fall, so she's getting lots of practice at talking about her work. Lab-mate Cate Bressers also presented her work AGU, findings from her Summer 2016 participation in a prestigious Incorporated Research Institutes for Seismology (IRIS) Research Experience for Undergraduates (REU) at the University of Colorado where she was immersed in the world of reflection seismology. Cate is continuing to work on Taiwan and aims to make that the topic of her Geoscience Day talk. She is documenting strain along the boundary between the colliding Luzon arc, marked by the Taiwan Coast Range, and the suture zone to its west. The crystalline rocks exhuming in the collision zone are the target of Jon's NSF proposal so Cate's work will provide important constraints on the boundary conditions contributing to mountain building here. The IRIS REU, research on Taiwan, and a second B.S. in Computer Science position Cate nicely for graduate school. She is applying for PhD and MS programs now. Allie's fieldwork in Taiwan, her research productivity (including AGU talk), and a minor in Mathematics have her in a path for graduate school as well. She too is

Faculty News — Jon Lewis

applying for graduate programs at present.

On the return trip from Taiwan Jon stopped in Tokyo for the Japan Geophysical Union (JpGU) meeting to give an invited talk in a session dedicated to the career of one of Jon's longtime mentors, Dr. Gaku Kimura. Then, within weeks of arriving back home, Jon headed south to Costa Rica for a short field campaign with longtime collaborator Walter Montero followed by a meeting in San Jose where Jon gave a talk about their findings. Walter and Jon have partnered with a recent graduate from the University of Costa Rica, Maria Cristina Araya, to document an active fault that transects western Costa Rica. They have already submitted this timely and provocative finding as a manuscript for publication – days after the meeting in San Jose the fault hosted three moderate damaging earthquakes near the town of Bijagua. The punchline is that Pacific coast of Costa Rica is not the host of a forearc sliver, as has long been argued, but rather an arc sliver. Their findings suggest that most of the Guanacaste volcanoes of western Costa Rica are translating parallel to the trench as a tectonic sliver.

After returning from Costa Rica Jon closed out his sabbatical by sailing on the University of Alaska Fairbanks **R/V Sikuliaq** from Seattle to Seward with 10 undergraduates from all over the U.S. and three other mentors. This was the final of three ship transits with students as part of the STEM Student Experiences Aboard Ships (STEMSEAS) project described in last year's GeoTidings. The project was supported by the NSF, and Jon and his co-investigator Sharon Cooper at Columbia University, have applied for 3 years of additional support. Their objective is to make many more transits on federally-funded research vessels available to students from communities that have historically not been part of the geosciences. If you're interested please follow us on FaceBook (https://www.facebook.com/stemseas/), WordPress (https://stemseas.wordpress.com/) or our webpage (http://usoceandiscovery.org/stemseas-2/).

STEMSEAS students from the R/V Sikuliaq exploring Alaska

Jon returned to the IUP campus for Fall 2016 energized by his sabbatical. Two new students look to be joining Team Tecto to take on parts of the Taiwan project. Amy Clegg is a recent transfer from the IUP Psychology Department as a senior. She is working to understand the plastic strain that is recorded in rocks of the eastern Central Range of Taiwan by petrographic analyses of oriented thin sections. This is pretty advanced spatial thinking for a newcomer but she's doing great. She is currently applying for an REU at the U. of Hawaii that would have her numerically modeling exhumation in Taiwan. Fingers crossed. Caleb McCombie has only just started entertaining the idea of tackling some aspect of Taiwan. Jon is still in recruiting mode as Cate and Allie both graduate in May.

Faculty News — Ken Coles

Planetary image studies and mapping with students is increasing in sophistication at IUP as new data sets and software tools appear. A number of current and promising future class and student projects are the result. This past year Samantha Cooper ‘16 estimated the discharge that created an ancient riverbed in Gale crater, where the Curiosity rover is now operating. We knew the rivers on Mars were big, but such a large valley draining such a small area gives food for thought. Ken attended the annual meeting of the American Astronomical Society Division of Planetary Sciences in Pasadena in October to see what other studies are being done on the Moon and Mars. He also spoke to his editor from Cambridge University Press, who hopes the Mars Atlas is nearly finished!

Education majors Zachary Spangler (who did his student teaching at Freeport High School) and Amanda Kirka (who did hers at Armstrong High School) both completed their degrees and earned their teaching certificates. Both are now employed, Zach at Eagle Ridge Middle School in Ashburn, VA and Amanda at Brockton High School (which has a new planetarium) in Massachusetts.

Ken volunteered at the Allegheny Observatory star party for the White House Frontiers Conference on emerging technologies in October of 2016. While he didn't spot any astronauts at the conference, lots of other folks saw Uranus and the Andromeda galaxy in the IUP 20-cm telescope.

Star party at Allegheny Observatory (White House Frontiers Conference; photo courtesy of John Holtz)

Ken giving a talk about IUP planetarium shows to the International Planetarium Society Conference in Warsaw.

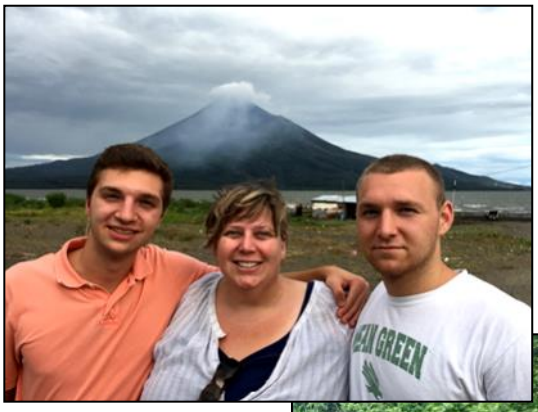
In addition to leading the Newfoundland field workshop in August 2016 with Nick Deardorff described elsewhere in this issue, Ken Coles visited Warsaw, Poland in June 2016 for the biennial International Planetarium Society Conference. He presented a paper on planning alternative public programs for the two-year period when IUP will be without a planetarium as the new science building is under construction. It was a productive interaction with lots of suggestions by planetarians from around the world.

While in Europe Ken took some time to visit historic sites in Germany, including the sundial collection at the Deutsches Museum in Munich. A sundial or two would be an interesting addition to the new science building!

Faculty News — Katie Farnsworth

Greetings all! I was lucky to both welcome in and say goodbye to 2016 in Nicaragua, not a bad way to bookend the year. I was there to spend time with family on both trips, but certainly found time to check out the volcanoes, beaches and cloud forest as well. The highlight to this year's trip was a return visit to Masaya Volcano. Currently this volcano has an active lava lake at the bottom of it, and I must confess that my family had to drag me away on our night visit as watching the dynamic movement of the lava and experiencing the waves of heat coming off of it was mesmerizing. It helped I had an awful cold and was not as affected by the sulfur-rich fumes as everyone else who retreated much more quickly than I.

Katie and her nephews at Mombotombo Volcano in Viejo Leon, Nicaragua



This past summer I attended the Earth Educators Rendezvous meeting in Madison, Wisconsin. It was a great few days of discussions on active learning, teaching with technology in the field and mentoring undergraduate research. The opportunity to network with like-minded colleagues from around the country and spend time talking about ways to improve Geoscience education was great motivation. It also provided a time to catch up with old friends and colleagues. Personally it also motivated me to complete one of my lifetime goals. I talked a friend into driving from Madison to Fargo, ND to achieve my 50th State! We had a fun time in Fargo and the friendly folks there inducted me into the "You Saved the Best for Last" Club for those completing their 50 State list. It was even better when we took the time to go to the headwaters of the Mississippi River. Accomplishments that meant as much to me for the bucket list check-off as for the great friends who celebrate my off-the-wall life goals.

Sampling from the headwaters of the Mississippi!

Research this year has been a busy one. Student projects have focused on the continuing Indiana County stream-monitoring program we have had going for about 5 years. This year we also started focusing on storm water runoff issues here in Indiana Borough and White Township. We have focused on Marsh Run and have multiple students working with us on this project as well. We have found some interesting storm relationships, and hope to increase our instrumented network in 2017 thanks to partnerships with the university, borough and township. December brought news that my paper on plume collision dynamics finally was published in Progress in Oceanography along with my colleague at the USGS (http://dx.doi.org/10.1016/j.pocean.2016.11.008). I started this work on my sabbatical and continued work throughout 2015. It was some interesting hydrodynamic modeling work, I learned a lot in the process. It was great for this to finally get published, as I suspect some may have thought I was just playing the ukulele on the beach the entire time I was on sabbatical! It has been great to hear from many alumni and to see some here and there. I am looking forward to meetings this year in the region where we hope to see more of you.

Faculty News — Nick Deardorff

Last year I think I wrote about having a newborn and being exhausted. This year I have a one year old and a three (almost four) year old and I am still exhausted. My youngest, Colin is walking and starting to get into trouble. His older brother is egging him on and teaching him exactly how to get under their parent's skin. However, troublemaking aside, I must admit the holidays are a lot of fun with young kids in the house. My Christmas tree this year is decorated with numerous ornaments made at home and from preschool for the first time.

Colin, Nick, Jenna and Braden

At IUP I have been focusing my research efforts on doing crystallization experiments on basaltic tephra using a Deltec tube furnace. This furnace goes up to 1500°C allowing us to heat or even melt most materials, much to the delight of my students. We are not currently melting rocks, but just heating them between ~700°C-1150°C. We then analyze and image them with a scanning electron microscope at Penn State to determine the extent of crystallization and interpret crystal textures. The purpose of this research is to determine the effects of reheating and recycling of pyroclasts (tephra) falling back into a volcanic vent, as reheating past the glass transition temperature will induce element diffusion and crystallization. Thus far we are having great success and receiving very interested results.

Last summer I had the pleasure of joining Dr. Ken Coles and 12 students on our field workshop to Newfoundland, Canada. We traveled all over that magnificent island and visited world class outcrops. It was truly a spectacular trip. The only real hiccups in the trip were Enterprise not having one of our reserved trucks and some very wet weather and leaky tents. These issues occurred in our first week in Newfoundland and after three days of headaches and frantic searching all over the island I finally found a replacement vehicle and the wet tents were easily replaced. We only had to make a couple of extra trips to a laundromat to dry out sleeping bags, clothes, etc. After those 'small' issues it was smooth sailing and beautiful, if a little wet, Newfoundland weather. The students were continuously optimistic and troopers in the weather; as expected of our durable Geoscience majors.

It was yet another great year at IUP. I wonder what 2017 has in store for me.

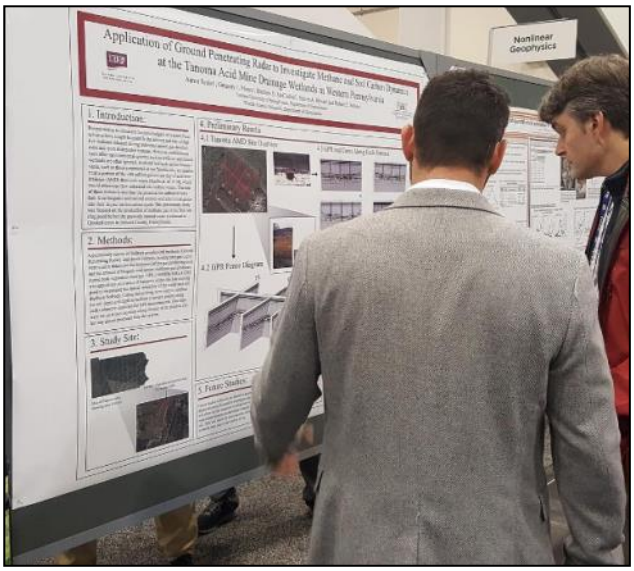
Student Cyrielle Humbert extracting her crystallization experiment. Inset- glowing red tephra as it is removed from the furnace.

Faculty News — Greg Mount

This year was spent getting the students out into the field as much as possible. Most of my classes had an opportunity to do fieldwork or contribute to ongoing research projects. Products of the field work have been presented at invited lectures in Pennsylvania and Florida, as well as by Aaron Seidel at the American Geophysical Union Fall Meeting.

Dr. Mount and his students run geophysical surveys across the Tanoma Wetlands (below left) and at the college's new Weyandt Experimental Site (below right).

Aaron Seidel '17 presents his research project at the AGU meeting in San Francisco this past fall.



In addition to class projects, IUP students participated in research campaigns at the Tanoma acid mine drainage wetlands, the Weyandt Experimental Sites, and at the Susquehanna Shale Hills Critical Zone Observatory (http://criticalzone.org/shale-hills/) with faculty, post docs, graduate and undergraduate students from Pennsylvania State University, Rutgers University, Temple University, Florida Atlantic University and Dickinson College.

I would like to thank the following groups and people that contributed to field experiences and funding. The Dominion Educational Foundation, Mr. and Mrs. Weyandt, NSF Critical Zone Observatories Groups, Pennsylvania State University, and The Research Institute at IUP.

Faculty News — Jonathan Warnock

This year has been a busy one for me. It was only my second and third semesters at IUP, so of course there has been a lot of work to do. Teaching duties keep me hopping, but I've been having fun developing new lectures and labs for the Sedimentology and Stratigraphy classes. Of course, John Taylor is a huge asset, pointing out where we hide the good specimens! In fact, he just walked into the office with a beautiful Lower Ordovician grainstone/boundstone for my Strat students to puzzle over next semester. It has been both intimidating and fun to build classes; I'm learning as much as my students.

This year has seen my lab fleshed out as well. One of my newest additions is a second microscope. It's a great help to have more freedom to schedule research time, especially with students in the lab. I am hoping the new 'scope can be a teaching tool as well. There is a digital camera attached to the microscope, which these days is a pretty standard feature. This camera, however, broadcasts a live

Two Southern Ocean diatoms, Fragilariopsis kerguelensis (left) and Actinocyclus actinochilus (right), which both indicate open water, ice free conditions. The image was captured live on my phone, using the camera's own WiFi signal.

WiFi signal. So any student who has downloaded the free app to their phone or tablet can see what I see in real time. Students can take and annotate their own images in real time as well. Here is one image (1000x magnification) I took using the phone app. The resolution is great!

The dinosaur quarry field crew pictured with Dr. Warnock at Little Grand Canyon, Wedge Overlook outside of Elmo, UT.

Probably the most exciting part of this year was my field season. While most of my research focuses on climate records at high latitudes, I've always been a dinosaur kid. This summer I got to take 9 IUP students to the Cleveland-Lloyd Dinosaur Quarry, a National Historic Landmark in central Utah. The quarry is the densest concentration of predatory dinosaur bone discovered on the planet to date. For two weeks the students mapped and excavated bone, prospected for new sites, measured stratigraphic section, and interpreted fluvial sedimentology. This year was the year of the footprint; we found and collected a number of theropod and ornithopod dinosaur tracks! The students had a great time, and were all very enthusiastic about the trip.

Students and volunteers excavate at the quarry.

It's been a great year in Geoscience, and I am looking forward to 2017!

Emeritus Faculty News — John Taylor

With appropriate apology to Mark Twain, John contends that reports of his retirement have been greatly exaggerated. Despite the liberation from teaching and committee chores over the past calendar year, his daytime schedule has changed little. After dropping Adam off for work at 8AM, and a quick run through the McDonald's drive-through for coffee, he settles in for a long day of work on fossil collections and/or delinquent manuscripts until Adam re-appears to head home at a tad past 8PM. Admittedly, the midday workout has morphed into a more protracted and leisurely hike that involves a tally of the bird species he encounters in traversing the fields and forests on IUP's south campus. But the other 9-10 hours are spent in blissful immersion in one project or another initiated back when he was a working stiff. Evenings, however, are quite different. With no course preparation or *grading* (said with face twisted in torment) to be done, he enjoys an hour or so of playtime with Kaitlin before her bedtime.

John points to the spot where a Colima Warbler (shown inset, not to scale) finally made his day .

Work-related highlights for 2016 include supervision of splendid senior projects by Wes Kamerer (agnostoid arthropods from Alaska and the Yukon) and Savannah Irwin (*Symphysurina* Zone trilobites from Alaska) in Spring 2016. Wes's project produced the first unequivocal age (middle Cambrian) for the Dempster Volcanics in the Yukon Territory. It also confirmed a contrast in age between that thick package of extrusives in the Selwyn Basin and the Whale Mountain volcanics, a similarly thick volcanic succession on the Alaskan North Slope, arguing against tectonic models that interpret them as detached segments of the same volcanic complex. In her project, Savannah discriminated at least ten different species of *Symphysurina* in the Jones Ridge Formation in eastern Alaska, and all appear to be new species of that diverse genus. She also reported a new species of *Tulepyge*, expanding the known geographic range of that widespread Early Ordovician trilobite.

John greatly enjoyed regaling attendees of his "swan song" presentation at this year's Geoscience Day with the exciting news that the Jones Ridge Formation has yielded evidence of a previously overlooked, thin, but prominent negative carbon isotopic excursion near the top of the uppermost Cambrian *Tangshanaspis* trilobite Zone – a rather astonishing discovery in an interval that has been exhaustively studied in many areas of North America.

John also enjoyed(?) the activities held at this year's banquet to celebrate his career and retirement, and greatly appreciated the time and effort invested by so many colleagues, current students, and alumni to make that occasion such a memorable event. It was wonderful seeing those who were able to attend, and receiving congratulatory messages from those who could not.

Emeritus Faculty News — John Taylor

(continued from page 27)

One alumnus who could not was brother Wil Taylor ’82 who offered some lame excuse about having to fulfill his duties as Biology Department Chair at the University of Wisconsin – Eau Claire.

Wil did, however, make it up to John by accompanying him a month later on a pilgrimage to the Chisos Mountains in west Texas to find a Colima Warbler, the only North American warbler John had never seen.

Fittingly, it required a grueling 10-mile hike, a bit of luck, Wil’s keen hearing, and John’s sharp eyes…but now there are none. And the date when they found it was 6/1/16. What better than a palindrome for the date when a (virtually) lifelong goal is achieved.

Emeritus Faculty News — Joe Clark

I enjoyed presenting a Geoscience Seminar last spring on “Darwin’s Atolls” based largely on a biologic expedition to the Maldive Islands of the Indian Ocean some fifty years ago.

Our Upper Devonian (“conventional”) natural gas exploration program has been on hold this past year in part because of low natural gas prices caused by the glut of Marcellus gas in this basin and by government over-regulation. We’re optimistic that 2017 will be a better year for the industry and for employment.

Joe Clark trekking along the border of Portugal and Spain.

I was pleased to attend a recent Pittsburgh Geological Society meeting with a group of our geology students, where Jeffery Greenawalt ‘80 of Susquehanna Exploration and Production, LLC and Brian Dunst ‘82 of the PA Geologic Survey had the opportunity to discuss with them networking and internship opportunities.

Proud of the recent recognition of Bob Kervin ‘02 now of Houston with an IUP Young Alumni Achievement Award and to learn of his successful oil and gas career in the southwest.

On a personal note, in May I hiked through the historic villages of Portugal seemingly lost in time to the border of Spain (see attached photo). And in July I backpacked in the High Sierra of California with limited fly fishing success, which I blamed on the high winds.

Best wishes — Joe Clark

Carbonate Geology of Florida: IUP's 2016 Winter Field Workshop

Greg Mount joined Karen Rose Cercone on this most recent IUP excursion to the Florida, bringing with him much-needed expertise in geophysics, snorkeling and van repair. The group left IUP on a cold January day and headed south, stopping along the way to examine the geochemistry of carbonate dissolution at Dixie Caverns. The group met up with Dr. Mount at his old stomping grounds of Florida Atlantic University in Fort Lauderdale, where the graduate students and faculty spent half a day with us to explain the groundwater geology of Florida and how they study it.

The Carbonate Geology class investigates Florida Keys megafauna.

After touring the mainland outcrops of the Pleistocene bedrock (the coquina of the Anastasia Formation, reefal units of the Key Largo and cross-bedded oolite of the Miami Limestone), the group headed down the Florida Keys to our base of operations, SeaCamp on Big Pine Key. The facility normally leads tours for K-12 groups, but in January it allows small groups of college students to use its boats, dorms and teaching facilities. In return, we let the SeaCamp teaching interns practice dining hall etiquette with us.

Unlike two years ago, the polar vortex did not follow us to the Keys, and we got in not one but two trips out to snorkel on the famous coral heads at Looe Key. The students also enjoyed wading across Coupon Bight to analyze sediment distribution, collecting green algae and mantis shrimp. We also got to experience sea level rise at first hand when a high tide flooded the camp's boat canal and cut off the men's dorm (and an IUP van) from the rest of SeaCamp for 24 hours.

Running geophysical surveys in Everglades National Park.

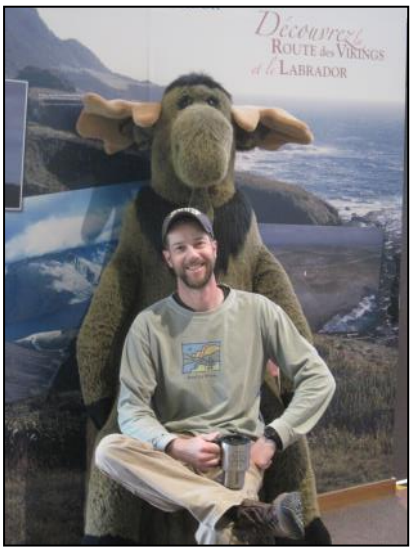
After a rainy free day in Key West, the group headed back to mainland Florida to collect geophysical data in the Everglades. The polar vortex put in a well-timed appearance here, resulting in one of the most bug-free trips to this park in IUP history. The group collected many good geophysical profiles, before packing up and trekking back north to IUP.

The Geology of Newfoundland: IUP's 2016 Summer Field Workshop

Since Dr. Taylor retired last year, Nick Deardorff joined the Ken Coles in leading the 2016 field workshop and added his perspective on all things igneous, including the Bay of Islands ophiolite. We saw lots of pillow basalts this year, but fossils still figured prominently as well.

This was the first time the group flew to Newfoundland instead of driving for three days each way. Thanks to the alumni-supported Next Generation Field fund, we had more days in the field and were able to spend more time in each area. We added some new locations, including pillow lavas at the mouth of the Bay of Islands (group photo) and on the north coast. The weather was wetter than 2010, and the tents were tested (and in two cases replaced) by these circumstances. We also faced some challenges with getting enough rental vehicles - the second day of the trip four game volunteers boarded the bus from St. John's to Stephenville, where the group reunited. Some wheeling and dealing by Nick Deardorff scored us a needed third truck a couple of days later.

Nick Deardorff shares a cup of coffee with a new-found friend



In keeping with the trend of field workshops in recent years, we expanded the mapping project at Broom Point to span three days, interspersed with visits to see other rocks of similar age in the area. This project was as much an education for the professors as for the students.

The Geology of Newfoundland class hiking up an ophiolite to view the Moho in Gros Morne National Park. The slope of dun-colored rock is hartzburgite, capped at the top by gabbro (not pictured).

Students took advantage of other opportunities in Gros Morne National Park. Several climbed the namesake tallest peak in Newfoundland, while others had a balmy (?!) afternoon at the beach. As in 2010 we made the all-day trip to Mistaken Point to finish up the trip, but it was a very wet day this time as the group viewed one of the best-preserved Precambrian fossil communities anywhere in the world. As Dr. Deardorff summed it up, Newfoundland has a combination of rocks and geology found in few other places and is well worth the long trip.

Please Stay in Touch

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Our students depend on alumni support to help them learn geology where it really comes alive — in the field. If you have the ability and desire to continue supporting IUP student field work or our other departmental education efforts, please consider donating to any of the following funds in the IUP Foundation: the Geoscience General Fund (224530); the Joseph C. Clark Research Scholarship (630545); the Walter Granata Memorial Fund (224784); the Paul Prince Memorial Fund (224783) and the Next Generation Field Geology Fund (224789).