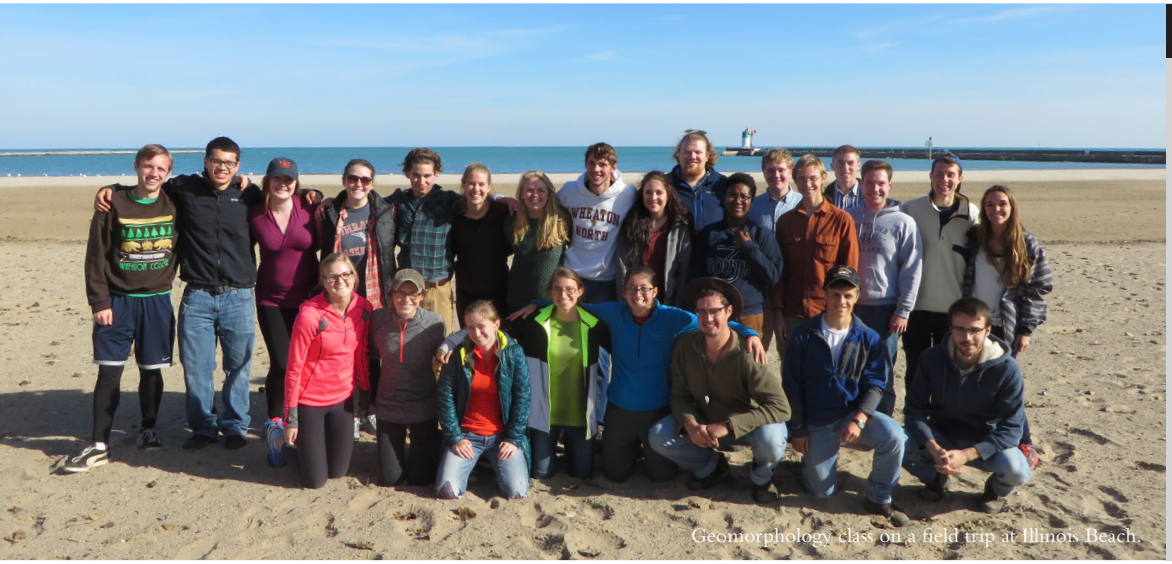
VOLUME 25, NO. 1 // APRIL 2016

Wheaton College
For Christ and His Kingdom

CONTACT

The Alumni Newsletter of Wheaton College's Department of Geology and Environmental Science



Geomorphology class on a field trip at Illinois Beach.

INSIDE THIS ISSUE:

FROM THE DEPARTMENT CHAIR

Stephen Moshier

We enjoy visits from alumni, especially now that we can share with you our home in the Meyer Science Center. It still feels new, even six years into our occupancy. One reason is that our space is always changing and always buzzing with activity. What would you see and hear (or taste?) if you visited us this week? Let's walk down the staircase to the lower level.

At the bottom of the stairs you stop at the display case outside of the Exhibit Hall. It's filled with over 250 frogs, marvelously carved from minerals, stones and other natural materials reflecting a rainbow of colors. The miniatures are a whimsical subset of the larger Art Smith Mineral Collection on display inside the Exhibit Hall along with specimens contributed from the Inderbitzen family and our ever-expanding department collections. Thematic displays feature geologic structures, living and fossil reefs, caves, ores and gems and our beloved Black Hills. In addition to geological displays, other sciences are represented there too. Three flat screens flash images of typical activities in the building, as well as videos documenting a marine biology field trip to Belize and the Perry Mastodon discovery. If you are lucky, today there might be a group of visiting elementary school children.

The open area outside of the Exhibit Hall is the crossroads to several busy classrooms and labs in the lower level. A wall mural there depicts the Earth's interior with information on seismology and plate tectonics as a working seismograph recording building motion and any earthquake in the world with a moment magnitude greater than 6. Other posters describe soil formation and Great Plains habitats. A hydroponic tower supports the lush growth of lettuce, tomatoes and herbs that will eventually be harvested for our dining hall (I did mention taste). There are two other hydroponic towers on our floor.

Glass walls and large windows allow you to peer into every classroom and lab! You would see the new Rigaku XRF sitting beside the companion Rigaku XRD in the control room of the Science Division analytical lab. Students from Geology, Chemistry or Biblical Archaeology are sitting at the computer controls of these instruments, determining crystal structures, identifying clay minerals or detecting the elemental compositions of various rocks or ancient metals collected in the Holy Land. Next door in the seminar room students in the environmental group ***A Rocha*** meet to plan a lecture series on climate change. Look into the glass wall forming the hallway across from the seminar room to see the Exhibit Hall through a life-size diorama of African animal taxidermy.

Walk further down the hall past the Geology and Environmental Science Office to spy on students in various labs learning how to collect and analyze air and water, making maps using state-of-the-art GIS, studying landforms with maps and areal imagery, simulating sediment transport and channel morphology with a large stream table, or identifying minerals and rocks with petrographic microscopes.

We are so pleased to be able to teach our Environmental Science and Geology majors in our classrooms and labs. We thank all alumni who provided financial support for our facilities and who regularly contribute to scholarships and funds that enable faculty-student collaborative research. We can express our thanks by giving you a personal tour during your next visit. You can pick some lettuce, too! ■

The exquisite carved frog collection donated by Art Smith '57

WANT TO SEE THE PHOTOS IN THIS ISSUE IN COLOR?
Download pdf versions of CONTACT at **WHEATON.EDU/GEOLOGY**

DOC MO'S MEMOIRS

The past year is distinguished by lots of time on my keyboard writing-writing-writing! But you can't keep a geologist indoors for long; two field trips are worth mentioning. Carol and I traveled to California during spring break 2015 to visit my son Joshua and daughter-in-law in Los Angeles. We made a side trip to Death Valley National Park. Carol wasn't convinced it was such a great idea until she took in the sights of blazing orange mountain ranges at sunset and glowing red sand dunes at sunrise. In March, the temperatures there never exceed the high 80s. The American Scientific Affiliation annual meeting was in Tulsa at Oral Roberts University in late July (when temperatures always exceed the mid 90s). Tulsa resident Ken Wolgemuth '65 led a field trip around the area, enlisting retired U. Tulsa geology professor Norm Hine, who I think everyone in the oil patch knows (I took a reservoir geology short course from him in the early 80s).

Back to my keyboard....spring, summer, fall and recent weeks were devoted to finishing the geology chapters for the co-authored *Scientific Theories of Origins, with Biblical and Theological Perspectives* text book, to be published next year by InterVarsity Press. I think the contribution is unique, in that I tell the story of planet Earth from its origin in the early solar system along side of the story of how geology as a science developed from the time of Renaissance natural philosophers Steno and Hooke. Showing how the early geologists, many of whom were devout Christians, related the emerging view of Earth history with the scriptural account of origins provides insights for contemporary students confronted with many of the same questions about science and faith. The chapters are lavishly illustrated with original graphics, photos of specimens from our collection and plenty of field photos. Joshua Olsen '14 contributed many of them.

A good bit of May was spent starting a manuscript based upon four summers of fieldwork at Tel Ashkelon along the southern Israel coast. Biblical Archaeology Professor Daniel Master and David Wheatley '12 are co-authors. We propose that the tell and rampart system are developed on parallel transverse to barchanoid sand dunes capped by paleosols that formed between 75,000 and 20,000 years ago during a marine low-stand when the shoreline was located some 2 to 18 km west of its present location. The Harvard sponsored excavation at Ashkelon, which has involved Wheaton College Biblical Archaeology and Geology majors for years, will end next summer. Wheaton College will be the primary institution responsible for a new expedition to Tel Shimron (east of Haifa) beginning this summer with a geophysical survey.

I am serving my second year on the Executive Council of the American Scientific Affiliation. As a new ASA member during grad-school days, I came to rely on the ASA for fellowship with other Christians in the sciences and the resources of the journal *Perspectives on Christian Faith and Science*. It was important encouragement to me that a few thousand scientists across North America shared the same faith in Christ and passion for His natural world. Even more today, I believe we need the ASA as a voice in the scientific community, the church and greater culture. Some of you are members, some of you used to be members, some of you are only slightly aware of the organization. If you would like to see something tangible produced by the ASA, in cooperation with and National Association of Evangelicals, take a look at the booklet *When God and Science Meet: Surprising Discoveries of Agreement* (free download at http://nae.net/godandscience/). I encourage you to join ASA or renew your membership. ■

CLARK'S CAPERS

Jim's work with his inexpensive geophysical instruments is expanding with many different groups and organizations working to improve the equipment and software. One water well drilling mission group has redesigned the instrument and trained an indigenous team to travel in Africa in support of their manual drilling program. He quotes some of their reports - "One story we heard was the drillers had bored water wells in the valley of a certain area but the people lived in the high place where there was no water. A VES (i.e. vertical electrical sounding [resistivity]) team was sent in to the high place and found a good location and a water well was put in. The drillers were impressed with the VES meter as this was the first water well in the high place where there was supposedly no water. Another story was that an area was too rocky for hand drilling water wells. The Christian church in the area prayed for help. The [mission organization] responded and a VES meter team found rock everywhere but they noticed a few places 6 ft deep where the rock was only 3 ft thick instead of 40 ft thick. They brought in a latrine digging crew who dug down 6 ft with shovels and used hammers and chisels to get through the 3 ft of rock and then the drillers hand drilled a water well. This method was used for 18 water wells. The Christian church has multiplied as a result of answer to prayer." It is reports like these that encourage Jim to continue to improve and advertise these little instruments.

Jim's paper "Appropriate geophysics technology: Inexpensive instruments for water exploration at a local level in developing nations " which will appear in GSA Special Paper 520 edited by Jeff Greenberg and Greg Wessel is coauthored by Wheaton students Ryan Franklin '14, Noah Miller '15 and Michael Morken and his faithful "hobby night" colleague Rick Page. Reported in the paper is the upgraded resistivity instrument controlled by a microcomputer and a cheap geophone design ($15) using a $3 piezoelectric element.

Jim took his instruments to the Democratic Republic of Congo last summer with a team from Engineering Ministries International (EMI). The goal was to advise a World Vision project trying to provide water for a village of 27,000 people. Although the region receives 1.5 m of rain each year there is a long dry spell in the summer when villagers must walk more than 2 miles and descend more than 200 m to get water from a spring. Jim's instruments and groundwater modeling with MODFLOW helped demonstrate that there are regions in the sandy plateau that have impermeable lithified sediments causing a sporadic perched water table. Here shallow wells can be dug to provide water during the dry season.

Because of the success of that work he was asked to give a workshop for the engineers at the annual EMI conference in Washington DC. The topic was well siting basics in developing nations. ■

KEIL'S CORNER

Environmental Science students get valuable experience with internships!

Internships are a fantastic way for students to gain professional experience and gain insights into a discipline that can't be taught in a classroom. The National Association of Colleges and Employers and other sources tell us that internships on a resume improve a graduate's employment chances far more than good grades do.

Environmental Science is one of only three programs on campus that require an internship as part of the major curriculum. Last summer we had a large number of students doing internships or research work. The breadth of the settings in which environmental science students worked illustrates the interdisciplinary nature of the program.

- Texas Commission on Environmental Quality: assisting in compliance operations across all types of pollution
- A Rocha Ghana: work with community resource management areas
- A Rocha Peru: management of arid forests
- Millican Reserve: assisting in the integrated management of a nature reserve in Texas
- Garfield Produce: participating in the production of hydroponic vegetables and community development in the inner city of Chicago
- International Sustainable Development Studies Institute: environmental health conditions research among Shan refugees in Northern Thailand
- Wheaton College Science Station: researching influence of mountain pine beetle on nitrogen cycling in South Dakota
- Wheelock College: community environmental education in Boston, Massachusetts
- Lyman Woods Interpretive Center: ecosystem management and control of invasive species in Downers Grove, Illinois
- Raja Ampat Research and Conservation Center: project on sweet potato farming as alternative sustainable livelihood for indigenous culture in Indonesia
- Dietz-Gourley Consulting: environmental engineering consulting in Pennsylvania
- Dickinson College Sustainable Farm: biogas production pilot plant in Pennsylvania
- Rising Village: sustainable income generation for single Mothers in Ghana, teaching seamstress apprentices
- Upland Holistic Development Project: work on their model sustainable farm in Thailand
- Jacob's Well Community Garden: community development through semi-urban gardening in Normal, Illinois
- Au Sable Institute: mottled sculpin as indicator of stream environmental quality in Michigan
- San Lucas Nicaragua: alternative rice farming
- ChemRisk: risk assessment in Pittsburgh, Pennsylvania

You can see that the Environmental Science students are doing internships across a wide variety of aspects of the discipline and across the globe!

We are always looking for good placement opportunities so if you know of summer internships, or even internships during the school year, please let us know. Or if you'd like to hire any of these talented students, we can connect you with them! ■

PROFESSIONAL PRESENTATIONS

GSA 2015 Annual Meeting

Undergraduate service-research via predeveloped surveys. **GREENBERG, Jeffrey.**

Exploring groundwater dynamics in a coastal foredune environment. **HAHNE, Sara.**

Measuring sulfide and iron in sediment pore water. **JOHNSON, Anjelica.**

Brittle and ductile deformation structures associated with clastic pipes, Jurassic Carmel formation, southern Utah. **WHEATLEY, David; CHAN, Marjorie, HANSFORD, Mark**, **TREAT, Ian**, **FOLTZ, Katy.**

Engineering Ministries International Meeting

Basic of hydrogeological exploration in the developing world. **CLARK, James.**

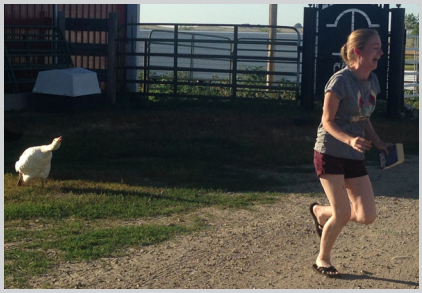
GSA 2015 North Central Meeting

Terrain analysis applied to the siting of ancient seaport Ashkelon, Asrael. **KINCZYK, Mallory**, **MOSHIER, Stephen O**. and **CLARK, James**

JOIN US ON FACEBOOK!

"The Department of Geology and Environmental Science"

FUN & GAMES



Ellen Gieser '18 being chased by a goose on a ranch during field work in Southeast Montana.

For GIS day this past fall, environmental science major Elizabeth Hossink '18 baked and decorated a wonderful cake!

THROWBACK

From the Archives: Four geology students, four different states.

From the Archives: Steve Moshier and Jeff Greenberg leading a field trip to southern Illinois in 2000

JEFF'S JOURNALS

Peace and joy for all you great people! I really mean that greeting. Increasingly I recognize how precious the friends that God places in our lives are. Most recently, sweet words, thoughts, prayers, and material services (meals, etc.) have flowed from the true "Angels" called to support our family. Many of you already know that my soul-mate and partner, Diane, has developed advanced stomach cancer. At this writing, she has undergone one half of an initial regimen of chemo-therapy treatments. This imposed poisoning of the body is brutal; however, its purpose is for healing. We are not only thankful that the Lord has provided such wonderful friends but that our medical care here is second to none. Consider all-the-world-over how few are blessed as we are. We are thankful and hopeful. We know not our day-to-day struggles or blessings, but we do know where we are heading and who secures us forever!

The advent of Diane's illness has flipped all of our family's existence around and out of a former meta-stability. My professional objectives have been badly bruised but not destroyed. Most plans are even more tentative than before. I intend to teach again at the Science Station this coming summer. "Insha-Allah" (if God wills), we will be there again. Some academic and some service-oriented pursuits are on hold. The incredible WASTE Project, tasked with designing and implementing a waste-water sanitation system into the developing world is still there but not currently moving forward (please pray!). I see no immediate need for travel to Kosova in Eastern Europe after five exploits. I even soured out on a manuscript covering the impressive exposure of dynamic geology at Pactola Dam in the Black Hills. I have the paper and revision ideas, but my heart just isn't in it right now.

Good news comes in the quickly approaching publication of a Geological Society of America volume, GEOSCIENCE FOR THE PUBLIC GOOD AND GLOBAL DEVELOPMENT: TOWARD A SUSTAINABLE FUTURE (Special Paper 520), that I co-edited. The book has 39 papers from international authorship, including an article by colleague Jim Clark, and Geology-Environmental Science graduates, Stephen Chignell '13, G. Thomas LaVanchy '98, with a WASTE article co-authored by Kaitlyn Wallett '14, Christine Gamble '13, as well as colleague Chris Keil. I am on the WASTE article plus one as sole author and one as co-author. This effort showcases the academic soul of Wheaton College at a time that the entire world ought to see its reality.

If Diane is well, she and I will go to California for a week in March. I will be contributing some speaking and discussion at both Evangelical Azusa Pacific University (my son's alma mater) and Roman Catholic Loyola Marymount University, where my son now works. The theme of the visit is promoting STEM (Science-Technology-Engineering-Math) vocations for Christians. This is supported by APU and an OPUS (our campus vocational initiative) fellowship. I hope and tentatively plan a book project on this theme. It would be a fine contribution to collect papers on many topics that help believers see the value of "calling" into STEM careers.

This coming fall begins the College's completely new General Education program, "Christ at the Core". Three years and much labor brought the new curriculum here, and everyone in G&ES department will be involved. The Geology and Environmental Science department's strong emphasis on general education also allowed the hiring of a new colleague to help carry out the greater load of courses. I will be offering a First-Year Seminar class with a specified set of common readings and a finale of three weeks looking at Creation Care in our context as disciples. ■

THE GREAT BASIN TRIP: ALUMNI AND STUDENTS TRAVELLING TOGETHER

Jeremy Vaughan '99 (GEOL)

This past spring, I had the pleasure of leading an intrepid group of explorers on a geologic journey through the northern Great Basin. Over the course of a week, we covered 550 miles of God's country. There were ranges and basins followed by ranges and basins. As we paced our way across attenuated crust, the landscape bore witness to a dynamic geologic history that has generated one of the most economically significant metallogenic provinces in the world. What makes these adventures so sweet is not just the aesthetics of a beautiful landscape or the wonder of powerful geologic processes; no, it is the sharing of these experiences with old friends and mentors, new friends and our Creator.

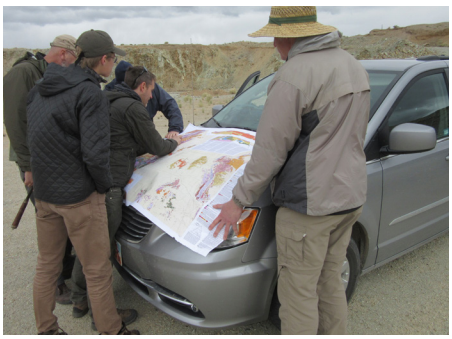
When the opportunity to lead this trip fell into my lap I made a list of all the stops I'd like to make moving from east to west across the Great Basin. I was excited to show off my backyard to the uninitiated, but soon realized that my list was a bit long. It would take at least a month to hit all of the sites I had deemed worthy. A single week was not nearly enough time for even a proper introduction to the Great Basin. There were also requests to incorporate geomorphology, environmental science, and petroleum geology. The end product took the group on a whirlwind tour that included aspects of igneous petrology, volcanology, tectonics, geomorphology, metamorphic core complexes, ore deposit geology (copper and gold deposits), petroleum geology (briefly), stratigraphy, environmental science, contact metamorphism, structural geology, and probably much more that I'm forgetting. I appreciate the group for humoring me on this ambitious trip, and I hope they enjoyed it as much as I did.

The trip started with a gathering of the group in Salt Lake City, Utah (my home base). After some time of introduction and fellowship, I laid out the plan for the group. We started with a trip through the Wasatch Mountains where we traced late Eocene to Oligocene igneous activity from a paleo-depth of 11 km all the way through the paleo-surface outflow facies. This transect served as an introduction to the roots of the porphyry forming environment that is manifested in the super giant Bingham Cu-Mo-Au deposit to the west of Salt Lake City.

Next, we journeyed west towards Elko, NV, a modern gold mining town in northeastern Nevada. Along the way we marveled at the enormity of the Bingham Canyon tailings facilities, the geomorphic imprint of ancestral Lake Bonneville, Quaternary tectonic activity along the range fronts, and the expanse of the Bonneville Salt Flats. From Elko we learned about oil shale in the Tertiary Elko Formation and journeyed up Lamoille Canyon into the Ruby Mountains metamorphic core complex (aka the Nevada Alps).

Heading west of Elko, we stopped for a tour of the giant Cortez Hills gold mine (one of the largest gold mines in the world). The Cortez Hills mine staff took us to an incredible overlook of the vast open pit extracting the gold. This tour served as an introduction to Carlin-type (no see-um) gold deposits that Nevada is famous for. There was no time to linger, though, as we headed further west towards the town of Winnemucca. Along the way we made stops to look at cryptic hydrothermal alteration associated with gold mineralization at Iron Point and historic gold mining operations in the Getchell district.

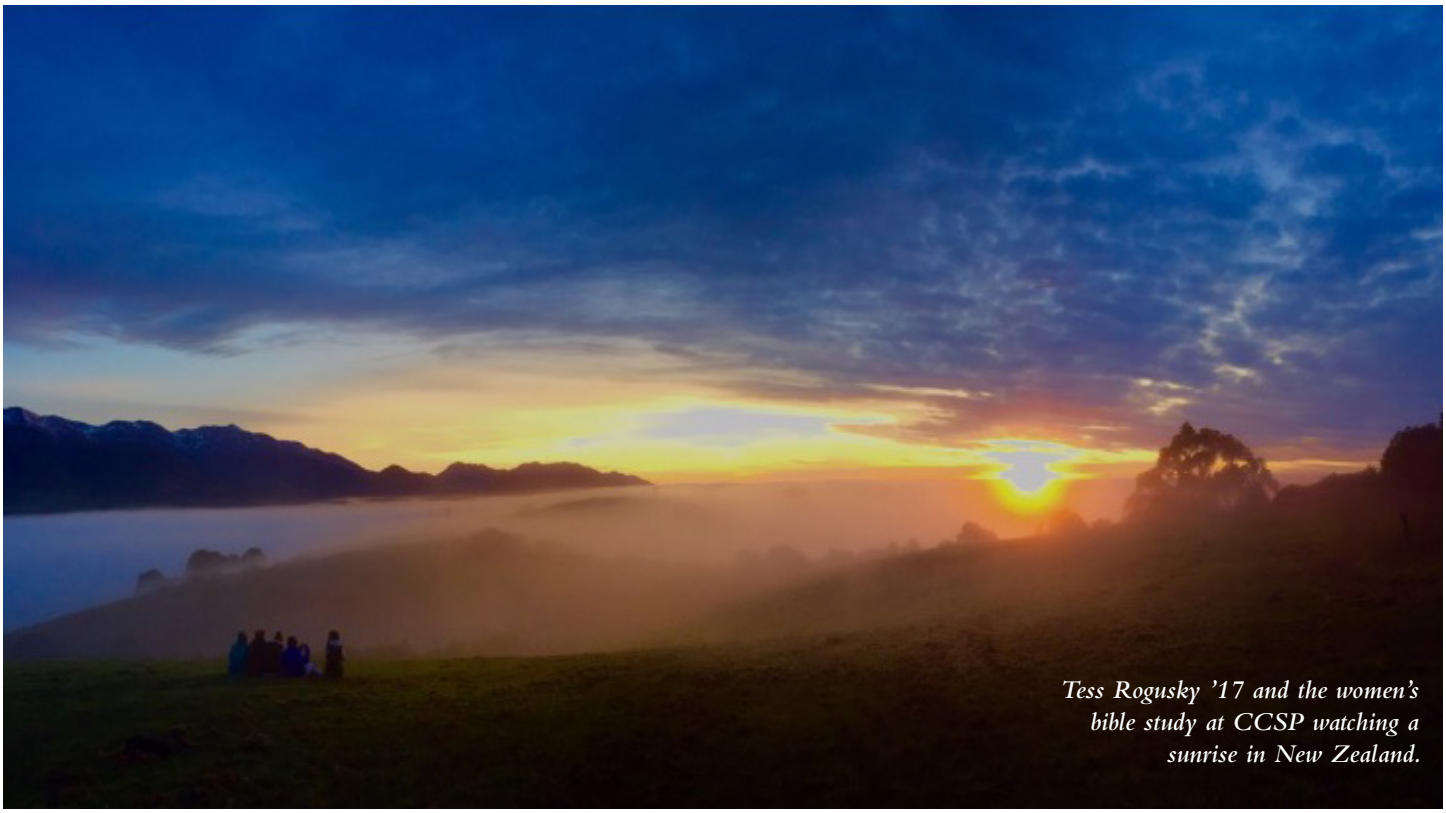
After a night of fellowship in Winnemucca, the group headed to the copper district near Yerington, NV. At Yerington we saw the ugly legacy of mining in the west and discussed the environmental impact of extractive industries in the past, present, and future. There was also an exciting geological stop near Yerington. The Casting Copper Skarn is a salite and andradite skarn with beautiful exposures. After a lot of specimen collecting we bid Yerington adieu and headed out for the final leg of our trip. The trip concluded with a night in Reno followed by a visit to the famous historic mining town of Virginia City. In Virginia City, we were able to get a taste of the Wild West and walk in the footsteps of Mark Twain. It was a good end to expansive trip that covered a lot of ground and (hopefully) generated good memories for all involved.



Jeremy Vaughan '99 teaching the group about the geology and environmental issues related to mining near Reno, NV. Photo credit Jeff Greenberg.

But again, this trip was truly made special by the relationships formed and strengthened throughout our adventure. I really enjoyed the opportunity to reconnect with Jeff Greenberg and Jim Clark, get to know my fellow Advisory Council members Stuart Dykstra and Rich Aram '76, and meet the next generation of Wheaton College geology majors. It was a great time of fellowship not easily replicated, and I highly recommend participation in future opportunities.

I certainly hope that I can. ■



Tess Rogusky '17 and the women's bible study at CCSP watching a sunrise in New Zealand.

EXPERIENCING THE GOOD LIFE

Tess Rogusky '17 (ENVR)

If you have ever read The Chronicles of Narnia series, embarking on a journey to New Zealand was much like stepping through CS Lewis's wardrobe. Perhaps it has something to do with the fact that multiple scenes from the movie versions were filmed in New Zealand, or maybe it is the simple magic of the land. The Creation Care Study Program emphasizes living in community, and truly experiencing the "good life". An excerpt from a blog post I penned during my experience abroad encapsulates my experience perfectly, "Day-by-day, I am gently rediscovering what it means to live the good life. It means loosening my grasp on technology so that I can live more presently. It means weeding in the garden outside, and doing dinner dishes for thirty people even when you have a test the next hour. (Blasting Taylor Swift while doing the dishes really does make it go faster I swear). The good life includes sunrises, sunsets, mugs of coffee, sprinting headlong into the ice cold ocean, listening to birds chirping, tipping up your chin to see the Milky way at night, and learning to truly love God's creation and our call to care for it. Most of all it is learning to see the outpouring of God's love reflected through every small or large gift the day may bring." My experience abroad was riddled with immeasurable treasures one only finds in a place more filled with whimsy and magic than Narnia. ■

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Most of all it is learning to see the outpouring of God's love reflected through every small or large gift the day may bring.

A NEW PARTNERSHIP WITH CARTHAGE COLLEGE: STRATIGRAPHIC SURVEYING OF THE HELL CREEK FORMATION

Andrew Garber '16 (GEOL)

The summer of 2015 brought the Wheaton Geology Department a new opportunity for inter-collegiate cooperation. I joined several Wheaties, including Jamie Fearon, Dr. Stephen Moshier, and several current geology majors on an expedition to rural, southeastern Montana, where the Carthage College Institute of Paleontology has their field site on a large swath of BLM land. Every summer for several years, Carthage has been digging for terrestrial fossils in the soft sediments of the Cretaceous Hell Creek Formation. Thanks to a connection started by Aaron Kennedy '16, who volunteered on the same dig in the previous year, Carthage now knows our geology department. This year, Dr. Thomas Carr of Carthage asked Wheaton to send a team to assess the geology of their region.

Each day in camp, we would be up and on the trail by 7am, our packs loaded with food, water, and equipment, and hiking out for a long morning of fieldwork. The daily work for the Wheaton geology team was measuring stratigraphic sections, which we did the old fashioned way: hand-digging hillside trenches, measuring units with a tape or Jacob's Staff, and taking lots of field notes. In early afternoon, we would return to camp to wait out the high 90s afternoon temperatures in the shade of a big canvas tent. After dinner, which was the only hot meal we ate most days, we would work again until sunset and then return to camp for the night.

Besides the obvious benefit of fieldwork experience, for me the best part of this experience was encountering other people on the expedition team. The Carthage component of the group consisted of a motley group of scientists, artists, social workers, and students who were all enthusiastic about getting grungy in the heat of a Montana sun and looking for dinosaur remains. I joined or listened to interesting conversations on art, literature, paleontology, botany, and geology with people whose backgrounds are wildly different from my own. For the first time, I actually heard someone critiquing creationist origins views in person, and this happened while the group was packed into a ranch house kitchen, waiting out a formidable thunderstorm. Hopefully our partnership with Carthage College will continue during future summers. There is certainly plenty of work left to do. But, more importantly, I hope they continue this partnership so that other Wheaties can have this kind of an opportunity to meet people in the (geoscience) field, in the field. ■

Outcrops of the Hell Creek Formation in Southeast Montana. Photo credit Andrew Graber.

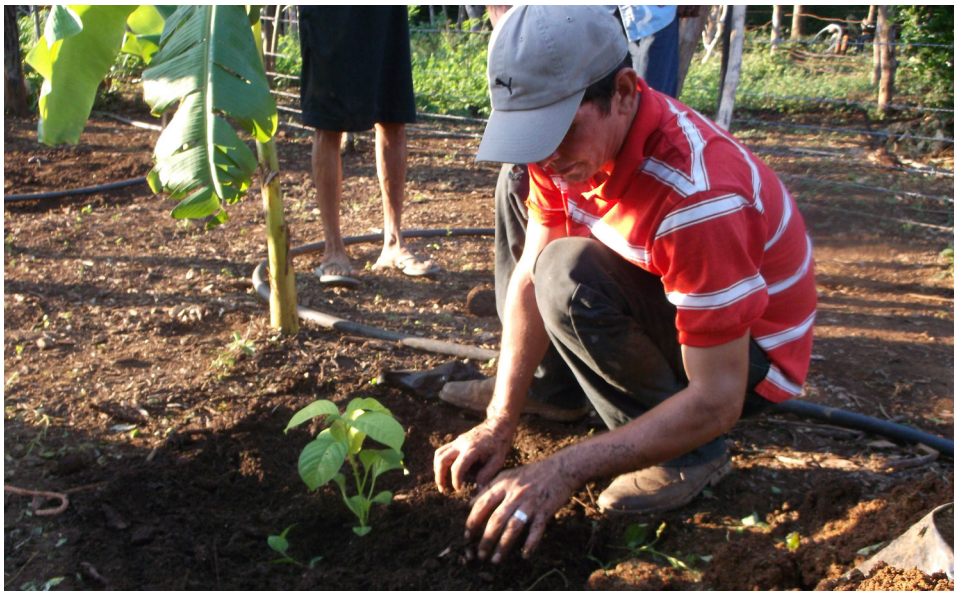
EARTHWORM MOMENTS

Kelly Wilson '16 (ENVR)

I often think of myself and my aspirations through the metaphorical lens of living and becoming more like an earthworm. I assume that because the readership of this newsletter is made up of environmental science and geology alumni, you have a greater appreciation for the humble earthworm than the average human being. Earthworms are not only an indicator of life in the living soil, but they also engender life in the soil by increasing water infiltration, nutrient accessibility, and generally making the soil a healthier and happier ecosystem. Earthworms, I believe, are a sign of the Kingdom already here.

The six months that I spent in Nicaragua as part of the Human Needs and Global Resources (HNGR) program only increased and affirmed my desire to care for and promote life in human and nonhuman creation as earthworms do. I worked with Fundación San Lucas, an organization that faithfully seeks integral community development in the rural, poor communities of the municipalities of La Conquista, Santa Teresa, and Jinotepe in the department of Carazo, just about an hour south of the capital city of Managua. I joined the food security team made up of two amazing Nicaraguan agronomists who not only have extensive knowledge and experience in agriculture, but also love and empower community members in Christ's humility. Surely, the most impactful aspect of my experience was the crippling drought due to El Niño that struck Central America for the second consecutive year and specifically caused much suffering and loss for the marginalized subsistence farmers that I became friends with. Farmers who rely on their land for everything lost their food, their seed, their harvests, the water in their wells, and the pasture for their cattle. Yet they did not lose their hope. Each day that rain refused to fall and the prospects for the growing season became dimmer, famers did not lose their faith and trust in the God who is sovereign over creation and who says, "I am your shepherd, you shall want for nothing." In the midst of Drought and Death, these farmers placed their trust in Life.

When I reflect on my time in Nicaragua, I am indeed struck by the helplessness and injustice of drought, that vulnerable people pay the price for the excessive consumption and creation degrading lives of the rich that are the predominant cause of climate change. However, this image of death and destruction of God's beloved children and his beautiful creation is not without hope in life and the Giver of Life: such is our daily reality in the already, not yet Kingdom. My HNGR internship, though characterized by drought, was filled with "earthwormy" moments in which I saw signs of life and goodness and people working to promote life for the land, life for rural farmers, and life for families. I hope to be like an earthworm in this way, and I ask that you join me in praying for life and rain for Carazo, the farmers, and all those faithfully serving to be signs of the Kingdom of life as drought is projected to continue, threatening first growing season of 2016. ■



Aldo, a community leader in Ochomogo, Nicaragua, planting a granadilla sapling. He is one of those people working for the kingdom in "earthwormy" ways.

WHAT CAN YOU LEARN IN THAILAND?

Meagan Jackson '16 (ENVR)

What can you learn from studying a language that confuses you by its letters, grammar, and tones?

You can learn that your perception of the world is completely different than that of the people you are surrounded by. They see humans as an integral, dependent part of nature, whereas you see nature as an unknown world to be explored.

What can you learn from following an old Thai farmer around his fields?

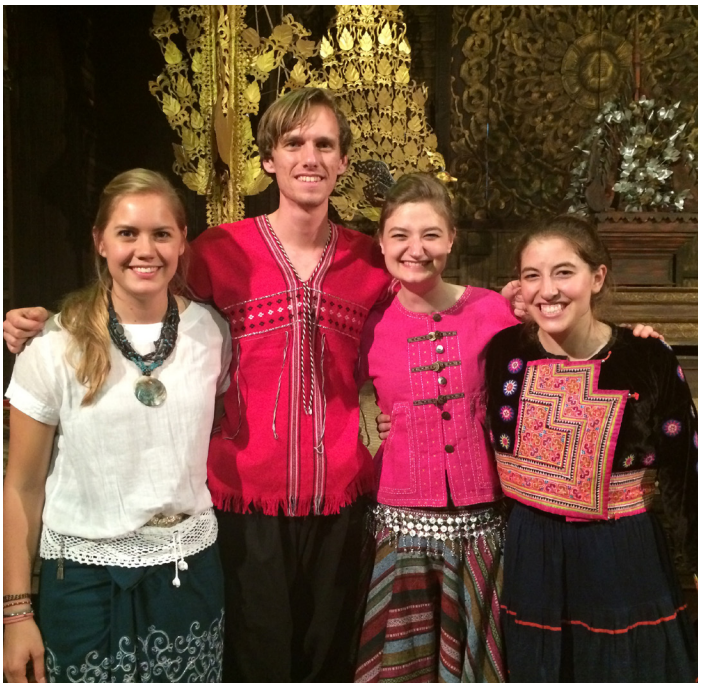
You can learn that access to water is an enormous privilege, overlooked by so many.

What can you learn from chasing your host sister around her yard?

You can learn that her yard is not limited to a fenced in, perfectly green lawn, but takes up the whole forest. She knows the names of each plant, and appreciates the many ways that her family depends on them for life.

What can you learn from sitting for hours on the porch of a refugee's house?

You can learn that there is always enough time. There is enough time to lament the loss of home, culture, and identity. And there is enough time to hope for better days.

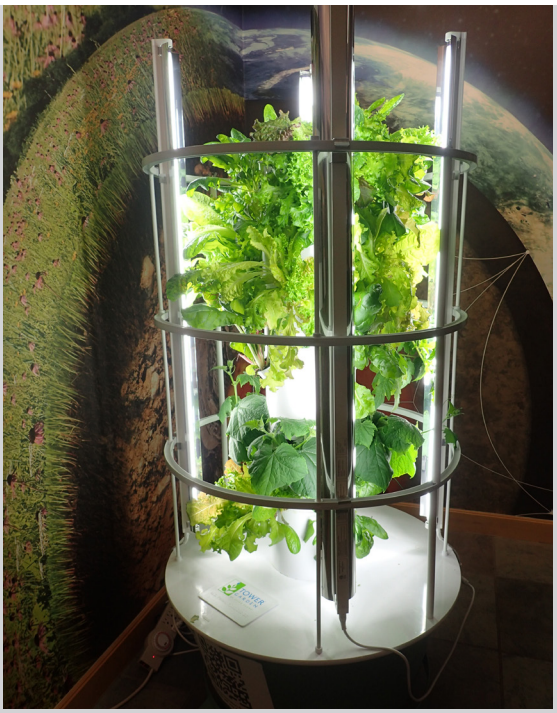


Wheaton environmental science majors, Bella Lopez '16, Nick Rubesh '16, Meagan Jackson '16, and Kelly Baglia '16, during their time in Thailand.

What can you learn from studying in Thailand with ISDSI?

You can learn that ***learning*** is a complicated activity, and that it takes a lot of time, practice, and humility to learn. ■

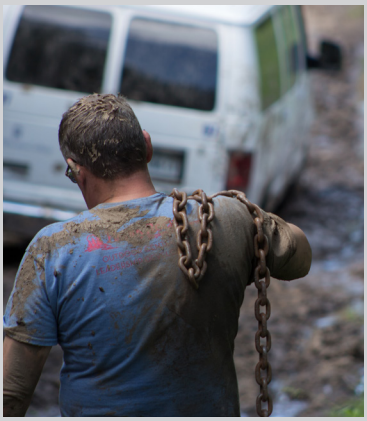
Meagan Jackson is an Environmental Science senior. She spent 6 months studying sustainable development in Thailand with the International Sustainable Development Studies Institute.



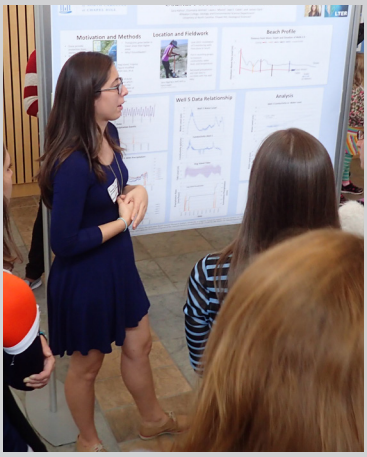
One of the three hydroponics towers producing vegetables in the geology and environmental science departments.

HYDROPONICS AT WHEATON

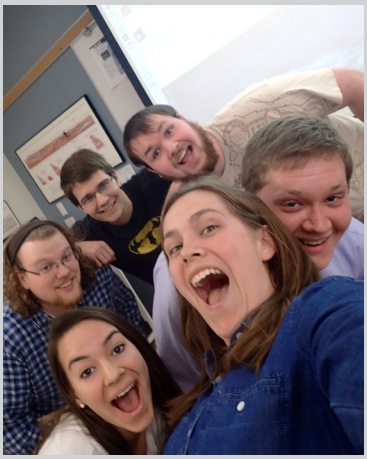
The Geology and Environmental Science department recently started a hydroponics demonstration project in collaboration with Bon Appetit and A Rocha, the student Environmental Club. The three "Tower Garden" systems have already produced lots of leafy vegetables and massive tomato plants in the trial phase. The gardening committee of A Rocha has taken ownership of the project and is working to produce herbs and other greens for use in the dining hall. The energy used for the systems can potentially come from renewable sources and producing locally eliminates the transportation carbon footprint of vegetables. The project goal is to raise awareness of the breadth of options available as we seek to find diverse solutions to sustainability challenges. ■



Chris Keil preparing to chain up and tow a Wheaton van at the science station after all other attempts to free the vehicle failed. Photo Credit Aaron Kennedy.



Sara Hahne '17 presenting her research from her REU in North Carolina at the 15th annual Summer Research Poster Session.



This year's crop of Earth History and Stratigraphy students sneak a class selfie during lab while Doc Mo was out of the room.

THE HARD WORK OF HOPE

Michael Sawyer '16 (ENVR)

This past year, under the Human Needs and Global Resources (HNGR) program that Wheaton offers, I worked for A Rocha Ghana. A Rocha is an environmental NGO working for ecological sustainability and faithful stewardship of the Creator's resources. A Rocha Ghana, especially the Damongo office I worked for, was interested in communities on the eastern border of Mole National Park. By seeking to develop alternative and sustainable livelihoods (i.e. beekeeping and microfinancing) and by empowering communities to social action, A Rocha desires to build a relationship with these rural villagers.

My independent study project (ISP) was about researching the informal, unregulated charcoal industry of northern Ghana. Specifically, I interviewed producers to see if they use and prefer certain tree species over others for their charcoal production. I also interviewed consumers to analyze consumption trends and to see if they prefer their charcoal to come from certain tree species.

What did God teach me while participating in the HNGR experience? This experience sometimes felt like emotional, relational, psychological, and spiritual boot camp. The intense furnace of an experienced solidified and refined much of who I am and what I value. I am beginning to understand that poverty is fundamentally an interaction gone wrong—

a broken relationship rather than merely a deficit of a missing material good. The latter is used as an escape mechanism for the privileged to not have responsibility in mending the relationship. When our Ugandan Christian brother, Bishop Zac Niringiye, visited Wheaton in 2009 and spoke at chapel, he courageously told an audience full of the world's wealthiest 1 and 2% that poverty is not the problem. The problem is idolatry. The problem is greed. When we honestly face the irony of rich Christians living in an age of hunger, we should talk less about "making poverty history" and talk more about how to "make greed history".

"This experience sometimes felt like emotional, relational, psychological, and spiritual boot camp."

As an environmental science major, I am learning that in a world suffering from enormous anthropogenic environmental decline, a person who works for creation stewardship must be disciplined in the hard work of hope. If someone is to do any long-lasting environmental work without being crushed from certain despair by listening to the largely ignored groans of creation, this person must have an everlastingly steadfast clutch on hope. If the kind reader would allow me to conclude by illustrating my point through analogy: hope is like a sweet fruit attached to the tree of life. Hope requires effort and time to develop into maturity. It must grow from the pre-existing branches of knowledge, patience, and endurance. Yet, more important than these, it is the small but resilient stem of faith that holds ever so tightly to hope—even through the inevitable storms of sorrow and the droughts of despair. All this is done so that hope may not fall but grow to its fittingly ripe sweetness.■

NEWS

Nancy Perrin '68 (1946-2015)

Nancy Ann Perrin '68 passed into eternity this past December. Nancy grew up in Kansas City, Missouri and earned biology and geology degrees from Wheaton College and completed her geology MS at Kansas State University and PhD at the University of North Dakota. Her research interests included Devonian carbonates in the Williston Basin. In between studies she worked as an elementary school teacher, oil geologist at Conoco in Oklahoma City and instructor of geology at Wheaton College and the Wheaton College Science Station. She devoted the rest of her life to geoscience education, first at Calvin College and eventually to Tallahassee Community College, from where she retired in 2009. She was an effective mentor to geology students and especially enjoyed field trips with them. Her popular Geology of National Parks course at TCC benefited from the many parks she visited throughout her life. Her many hobbies included reading, painting, stained glass, and taking care of her beloved cats. Nancy's fossil collection will be divided between TCC and Wheaton College.

Dawn Wright '83 Honored by Geological Society Of America

Dawn Wright '83 received the 2015 Bromery Award for Minorities at the annual meeting of the Geological Society of America, awarded to members of any minority group, "who have made significant contributions to research in the geological sciences, or those who have been instrumental in opening the geoscience field to other minorities."

Dawn has also earned other accolades, including the R. J. Russell Award for Outstanding Contributions to Marine Geography, Association of American Geographers (AAG) Coastal and Marine Geography Specialty Group, and the AAG Presidential Achievement Award. Her education awards and honors include the Distinguished Teaching Honors from AAG and US Professor of the Year for the State of Oregon from the Carnegie Foundation for the Advancement of Teaching.

Known as Deepsea Dawn, her credits as a distinguished marine geographer include expeditions in ocean drilling and submarine exploration. Her books include Ocean Solutions, Earth Solutions; Arc Marine: GIS for a Blue Planet; Undersea with GIS; and Marine and Coastal Geographical Information Systems (Research Monographs in GIS).

Still affiliated with Oregon State University where she taught for 16 years, Dawn serves as Chief Scientist at ESRI, an industry leader in GIS software, technology and applications.

Speak to Current Students

We would like to invite you into our classrooms! You don't even have to fly to Chicago if you have a Skype account. We have already done this with amazing success. You can share about your career, reflect upon the value of your Wheaton education and encourage the current group of undergrads. You could offer as much as a whole lecture or simply a story or two relevant to course subjects. We would like to start this in the fall when we will be offering Soil Science, General Petrology & Petrography, and GIS. If you are interested, let us know and we can send you a class syllabus.

Join Students at the Black Hills Science Station

We invite you to return to the Wheaton College Science Station in the Black Hills for a Geology-Environmental Science alumni reunion the weekend of June 23-26, 2016 (Thursday-Sunday). We tried this with a few of you in 2014. Students and alumni will take field trips together. You can encourage them with career and life advice and share stories from your summer in the Hills. You will have to be responsible for transportation and housing (we won't have overnight room on campus). Let us know if you are interested in participating!

Scholarship Awards

The merit-based Geology Scholarship was awarded to Matthew Deeks '19. Thank you alumni for your continuing contributions to our scholarship funds – we are blessed to have scholarships to aid our students. Please remember that you must designate these scholarships when making a contribution to the college.

Class of 2015 Graduates

Eight geology majors and six environmental science majors graduated in 2015! Congratulations!

Environmental Science:
Micah Edelblut
Alyssa Robinson
Rachel Burdick
Lindsay Copler (Aug.)
Holly Curtis (Aug.)
Isaac Carter (Aug.)

Geology:
Brandon Dykstra
Jennifer Fu
Ian Gottschalk
Noah Miller
Christopher Thompson
Ian Treat
Anna Chovanes (Dec.)
Valery Cislo (Dec.)

DEPARTMENT OF GEOLOGY
& ENVIRONMENTAL SCIENCE

501 College Avenue
Wheaton, IL 60187

STUDENTS IN THE FIELD

Left: Alumni and current students at the Cortez Gold Mine in Nevada during the Great Basin field trip. Top right: Steve Moshier sits atop one of the stratigraphy trenches dug to describe the Hell Creek Formation. Photo Credit Andrew Graber. Bottom Right: The A Rocha club hosted a Green Expo, showcasing local environmental organizations. Photo Credit Yuxi Zhao.