

The Fieldwork of Shared Experiences

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ABSTRACT

One undergraduate, six Ph.D. students, and one old crusty “desert rat” of a professor share their perspectives on fieldwork. Fieldwork changed our professional lives dramatically for the better – a message that can never be emphasized enough to future students.

Keywords: baseline, soils, future research, microclimate, undergraduate



INTRODUCTION

We view geography as the study of spatial relationships between and among place and people. More often, the study of geography stems from interactions and experiences that people share with their surroundings, be it the environment, ideals, or people that shape interpretations. Fieldwork can be an extension of, and uniquely shape, those who chose to devote their time to study it. Part of that unity stems from the multidisciplinary, collaborative nature of fieldwork and the wide array of opportunities the discipline offers. All of us are currently based at Arizona State University, what our university President coined “The New American University” where collaboration and multidisciplinary are promoted and prevalent. As geographers, we welcome a university setting that values a “melding of the minds”, and that the heat of our summer pales in comparison to the fires that feed the fun and family atmosphere that we are able to take towards fieldwork.

We present here some of our stories about why fieldwork is so important to all of us. Our experiences are fun, informative, frustrating, and heartfelt. But, above all, they are stories that have shaped how we approach the field of geography and the foci of our respective research interests. We hope that they are as informative as they are enjoyable, and that they illustrate not only our deep respect for geography, but the passion that geographers have for their craft and for the field. We all contributed equally, and we decided to present authors in reverse alphabetical order.

SURF AND TURF (SHANDONAY)

My first true fieldwork experience took place on a boat. Well, not really a boat, but rather two inflatable rafts with a wooden board tied to the top (Fig. 1). This vessel carried myself and three others out onto a small lake where the goal was to collect lake core sediment samples. We diligently checked our rafts for leaks before we dragged them into the water, paddled ourselves to the center of the lake, and dropped our DIY cinderblock anchors to hold our place. As we were about to begin collecting our cores, we noticed bubbles coming from one of the rafts – a leak. We worked quickly to collect what we needed, and by the time we paddled our way back to shore, our “boat” was lopsided. Although things went wrong, our field day was ultimately labeled a success.

A couple years later, I was out in the field on a mission to collect soil cores along a hillslope toposequence in the woods. I had chosen my core locations ahead of time, but I had vastly underestimated the steepness of the slope I would be collecting my cores from (Fig. 2). At each site, I felt I was standing sideways, and I had to get creative to prevent my tools from rolling back down the slope. Ultimately, this led to my field day lasting longer than expected, but despite it all, this field day was too labeled a success.

These experiences were nothing I thought they would be, yet they were everything I needed to realize fieldwork does not need to be glamorous. In fact, sometimes the not-so-



Figure 1. Our makeshift “boat” on the shore of Bass Lake in Beaver, Wisconsin.

glamorous, leaky-raft, steep-slope kind of fieldwork is the most fun, and most memorable.

THROUGH THE EYES OF A STUDENT (MOLL)

Every student remembers an activity, project, or event in a course they took. For me, I remember one of my professors using a donut on a string to explain forces, or more specifically, the shearing forces, as the donut flew across the classroom. For years I always tried to give my students those types of experiences. In a way, I wanted to expose them to fieldwork and hands-on activities before they even left my classroom. Students in front of a stream table, testing soil samples, or simply using a GPS unit to explore the campus are all ways to help a student see the world through practice. Unfortunately, now many of us in higher education take these simple skills and activities for granted. I love what I do now because I can explore these encounters with the students and hopefully understand how they influence their knowledge and maybe even their future careers.

Geography education’s fieldwork may not be as exciting as all the other stories you read here, but it can be just as important. Learning new geographical concepts, using different geographic tools in the field to test ideas, or even hearing stories during interviews and surveys, is a feeling I’m hopeful all students can have while learning. I know I could spend



Figure 2. One of the many hillslopes at Seven Mile Creek County Park in St. Peter, Minnesota.

pages telling you stories of my experiences while I learned to explore geography. I remember the first time a professor introduced me to cloud formations. While living in Arizona means a large majority of the days have sparse cloud coverage, our class was able to observe different cloud formations by simply looking up into the sky that day. I appreciated how the professor didn’t simply show us a bunch of pictures on a screen in the classroom, but had us conduct field work by observing, labeling, and measuring cloud formations and coverage. To me, this experience helped show me as an educator how to widen the walls of my classroom. Imagine if all we did was listen to lectures or read books, we never picked up a tool or went out of the room to explore the world. Experiences lead to ideas; ideas lead to fieldwork; and fieldwork leads to careers. I’m grateful that my teachers, professors, and even fellow students continue to encourage learners to get out into the field and explore. So, when you come back from the field, please show us those pictures, tell us those stories, but most importantly, show us what you learned.

CONFIDENCE AND CURIOSITY (MARVIN)

My experiences with fieldwork cemented my interest in studying sediment transport and geomorphology as well as gave me the confidence and curiosity to pursue a career in surface processes research. I was fortunate enough to have several professors who were keen to involve me, even as an undergraduate with minimal experience, in field campaigns and help me prepare my own research project. This, of course, involved fieldwork. My first encounter in this department came the summer after my freshman year at Arizona State. I traveled with Dr. Ian Walker to Joshua Tree National Park and the Lanphere Dunes, both in California to conduct uncrewed aerial systems (UAS) and LiDAR campaigns. This ten-day trip helped me realize the adventure that comes with collecting your own data and how fascinating a career in earth sciences could be. By the time I reached my final year of undergrad, I was able to visit several dune sites on my own, collecting sediment samples for my thesis. In addition to the freedom of visiting some of the most photogenic places in the Southwest, planning these trips developed my background in travel planning, logistics, documentation, and background reading.

Seeing the dynamic system I was analyzing for my thesis, rather than simply conducting a spreadsheet data analysis, gave me a sense of pride, triumph, and responsibility for the work I was doing. These memories, looking back now, confirmed my love for the outdoors and surface processes, ensuring that my research journey continued to graduate school. While working towards my PhD I hope to add to this memory bank and meet others who feel the same way as I, who itch to return to the field. I firmly believe that this handful of field excursions were the formative experiences for my young academic career and will go out of my way to encourage and clear roadblocks for others so they have these sorts of opportunities as well.

MEZCAL TIME (LÓPEZ-CASTAÑEDA)

When I was in my Geography third year at the National Autonomous University of Mexico, the structural geomorphology lecturer told us “We do not go to the fieldwork in order to reinforce what we have learned in the classroom, we go to the fieldwork to learn new things”, later on, the time will teach me that in fact, by doing fieldwork I have learned important things that probably I wouldn’t have learned without it, or at least not in the same way or with the same meaning.

1. Things never happen as we expected. Only by screwing everything up I have learned to be creative enough to overcome coarse situations.
2. Time is an abstract concept and does not work the same for everybody. Working with local communities I learned that my most urgent academic priorities are meaningless compared with their calendar, one that values the most the life cycle and the joy of being alive.
3. To practice the art of the conversation first is needed to learn to listen attentively, carefully, and patiently. The same applies to practice to the art of interpreting the landscape, first is needed to learn to observe attentively, carefully, and patiently.

I learned all of them are in the Mixteca Alta, an area in south-east of Mexico. All of them have bittersweet stories behind them, sometimes sweeter and sometimes more bitter. The number one story came in one of my first visits to the area. There were high expectations for that field trip. After long and complicated planning work, a group of geographers, biologist, geologist and geomorphologist finally visited together to develop multidisciplinary research. Unfortunately, the unexpected death of one of my professors, when we were commuting from Mexico City to Santo Domingo Yanhuitlan, changed everything. Nothing in my life had prepared me to face that day; but somehow everybody found the strength to deal with those hours the best way we could.

There was a time in my short academic career that I used to believe that the knowledge derived from the scientific method was the most important and significant I could find. My experience working with the local communities in the Mixteca Alta, however, changed not only my ideas about scientific knowledge; it change how I work, relate with others, and challenge my conceptions about life. I learned more from those who built the agricultural terraces I was studying than from those who write about them. I learned to listen to them rather than speak

to the terrace builders, and I learned the importance of taking time to enjoy life and share time with friends. It does not matter when; it does not matter how; it is just matter of willing. And, if there is a bottle of mezcal around, that is even better (Fig. 3).



Figure 3. The joy of being alive while doing fieldwork, describing an agricultural terrace soil profile while drinking mezcal. Santo Domingo Yanhuitlan, Oaxaca, Mexico, November 21, 2017, 10am approximately..., photo by Lorenzo Vazquez-Selem.

FIELDWORK AND GROWTH (KELLEY)

I started my Ph.D. with very broad research interests, and fieldwork has been an excellent way to develop and narrow down my questions. From the start, I wanted to focus on sediment transport and had interests in both aeolian and fluvial geomorphology. The excitement and energy helped push back feelings of doubt from imposter syndrome. With some great networking and help from my adviser, I connected with researchers from the Naval Research Lab, and spent my first summer contributing to their field experiment off the coast of Ocean City, Maryland. I had little experience in oceanography and never slept on a boat before. Many of the deployed instruments were new to me. Even though the experience was radically new, I convinced myself I could be useful and worked to learn absolutely everything I could.

And I did. It was amazing to work with such a large group of highly skilled people. My eyes were opened to the possibilities of what well-supported, large-scale research looks like. I learned: 1) I love being on boats (though I won’t be an oceanographer), 2) there are broad, transferable skills that apply to most fieldwork; and 3) fieldwork/science is wonderful when done right. The last part is crucial. Too often, in geoscience and other disciplines, making sure all team members feel safe and supported is overlooked, especially for people from underrepresented backgrounds. As a female in STEM, I have many times felt unheard or worse.

Fieldwork pushes you out of your comfort zone. Researchers in the field finds themselves trying new things and making critical decisions with the best information available at the time. For me, it is a magical time when I disconnect from

the world and go deep into my research. I love talking about science happening right before your eyes. At the end of the day, I love feeling sweaty and proud when you put your boots up at the end of the day. Some of my best memories is the love the flood happiness that washes over you when finally you solve a problem you thought was impossible. Lastly, I value times when we can pause and share words of encouragement, advice, or solidarity with a friend/colleague who is struggling.

Serious issues remain in doing fieldwork. We can glorify the importance of fieldwork in our field or otherwise without first acknowledging that it continues to create inequalities across genders, races, and career statuses. I have felt abandoned and scared while being verbally assaulted in the field by locals. Other times, I have been pushed to exhaustion by project managers who didn't listen to my physical and mental health needs. We all must acknowledge the severity of the problem. Clancy et al. (2014) reported that most of their survey respondents stated that they had personally experienced sexual harassment at research field sites.

There is a growing body of literature on implementing change. Demery and Pipkin's (2021) work provides great action items for fieldwork risk management for various levels in academia (researcher, adviser, institution). I especially take to appreciate their guidelines for what to do when the PI is not supportive. Beyond this, to share the magic of fieldwork, we must center voices that are not commonly heard and transfer resources and support to marginalized individuals. Not everyone loves fieldwork for the same reasons I do and many struggle for different, important reasons I am glad when I am able to listen and learn from those stories; we need to continue to improve this critical part of geographical research.

DISCOVERING GEOGRAPHY (HILGENDORF)

In my third year of my undergraduate degree at the University of Wisconsin-Eau Claire, I stumbled upon the "discovery" major that is geography. At the time, I did not know what I was going to end up doing for a career, but I knew that geography got me outdoors, my hands dirty, and my mind reeling from the wonders of an untapped world of knowledge. As the spring semester ended, to my surprise, I was invited to participate as a student assistant in local research on the Lower Chippewa Valley of west-central Wisconsin. The following two years could easily be summed up as "life altering," as I took my first plunge into fieldwork. Nearly 10 years later, I still grin when I think about those experiences, running the gambit from hydraulic drilling for core extraction and optically stimulated luminescence dating, excavating soil pits, describing fill-cut terrace sequences, surveying the extent of Quaternary incision across the Lower Chippewa, mapping the extent of invasive, channel-constricting grasses, and finding the best bakeries and creameries that Dunn County had to offer.

However, while field experiences are fun and informative, the life-altering part was not necessarily the work that we did, but rather the lessons I was taught. My mentors have a saying: "We're not teaching students, we're training colleagues" (Fig. 4). As a formative undergraduate, who had only ever considered the student-professor dichotomy in its classic sense, this mentality was shocking in the best manner. I was not a student. I was not an assistant. I was not a grunt. I



Figure 4. A meeting of the minds at the International Union for Quaternary Research (INQUA) LoessFest 2016 Annual Meeting in Eau Claire, WI, USA. From left to right: Dr. Garry Running, Zach Hilgendorf, and Dr. Doug Faulkner. Photo by Dr. Randy Schaeztl, September 25, 2016.

was a scientist. A member of a team. A junior colleague. My mentors had cultivated, and are still cultivating, a cohort of colleagues, now spread across the globe. As I prepare to try my own hand in academe, it is these lessons that have shone the brightest and that stay at the forefront of my mind. While simple, experiencing and growing as a young scientist under this style of mentorship taught me to not be afraid to ask questions, express ideas, or develop my own hypotheses. Without those experiences, I may not have found the same passion for geography and fieldwork that I have today.

SACRIFICE FOR THE CHOLLA GODS (HEINTZMAN)

Joshua Tree National Park is well-known for its desert climate and the plants and animals that reside within its boundaries. Several years ago, researchers at Arizona State University and the National Park Service designed a network of climate stations to monitor important ecosystems and transects. Every few months we go out to the stations, hiking out into the desert to download the data. I get to see seasonal changes across the park – grasses and flowers sprout up after soaking winter rain and creosote shrivel up in the heat of summer. Some stations are situated above sandy washes, others near stands of Joshua Trees. One station, however, requires a sacrifice.

Located halfway between the high western and low eastern halves of the park, a small weather station has been placed in the middle of a cholla garden (Fig. 5). Cholla balls are scattered across the ground and cholla stand near eye level. It's a misconception that cholla physically jumps, but sometimes I believe they are under the control of some vengeful god. After many trips out to this station, I'm certain there must be payment for the download, sometimes in blood. At least one researcher each download cycle finds a hidden cholla that, upon our return to the car, has latched onto them – if it had not been painfully felt earlier.

The most recent field visit was a memorable sacrifice. After downloading the climate data onto the laptop and starting to walk out of the cholla garden, I was feeling confident we would make a clean escape. Unfortunately, as this thought



Figure 5. The weather station at Cholla Gardens in Joshua Tree National Park.

moved through my mind, so did my right foot across my left leg. I took a step forward. Quietly embedded to the inside of my shoe was a roughly 4-inch long cholla segment, which began to sink its fishhook shaped spines into my leg. It was then pulled forward by my stride, tensioning along the original spines, and connecting even more. The cholla segment finally released from my shoe but was now painfully stuck. Although we always come prepared with needle-nose pliers, scissors, bandages, and experience, this time the researcher with me was unsure where to begin. They were afraid to cause more pain, so I took the scissors and pliers myself. Delicately, the cholla was cut from the spines first. Then, the numerous barbs were removed, and alcohol and bandages applied. A sacrifice had been given after all.

For now, the cholla gods are appeased, and until my next visit, they wait.

[The next author, Dorn, agrees with Dr. Heintzman that pliers are good tools to pull out bigger spines. However, I prefer to be stabbed by big spines than encounter glochids (or glochidia) of the *Opuntioideae* sub-family of cacti. Cactus glochid spines are hair-like, quite fine and tiny. You can barely see them, and you can only remove them with one tool: a new disposable 3 or 4 bladed razor. This amazing device removes glochid spines – especially if you are willing to sacrifice the outermost layer of your skin.]

THINKING (DECADES) AHEAD (DORN)

Luna Leopold was the first chief hydrologist at the U.S. Geological Survey. From his father, Aldo, he learned the importance of fieldwork. From his mother, Estella, he developed a deep love for the drylands of the American West. I was fortunate to take his graduate seminar in geomorphology at U.C. Berkeley, where he stressed the importance of establishing baselines for studies monitoring geomorphic processes over years to decades. He argued adamantly that it would be a waste of time to go exploring your new geomorphic surroundings (i.e., your new place of employment) looking for locations to take students without setting these baselines while you were out and about.

Luna's suggestion was an order for me, and one that I obeyed. I am grateful. I have yet to publish on most of these baselines (that I am still monitoring), but Luna's gift led to insights on the role of fire in boulder rock decay (Dorn, 2003), the role of ants (Dorn, 2014) and other organisms (Dorn, 2021) in dissolving minerals and sequestering carbon dioxide, the influence of land use land cover changes on soil erosion (Jeong and Dorn, 2019), and even how to make your office a field site for baseline monitoring (Dorn, 2012). When you get to your next job, don't just go explore. Follow Leopold's directive. Find an excuse to go set baselines, no matter whether you are studying rock decay, rivers, plants, soils, microclimates or human geography.

While most of these baseline studies took many years to bear publication fruit, you can set up projects that only take a few years. But it will take dedication to stay with it. Butler (2021) emphasized the importance of finding a special place to find motivation to persevere, his being Glacier National Park in Montana. Glacier NP is beautiful, I agree. Like Tuan (2021), however, I prefer deserts for aesthetic reasons in that the desert landforms I love, and need to experience regularly for my soul, are "exposed, uncluttered by dense vegetation and human works".

But Luna's advice kept ringing in my ears. How could I justify my addiction to experiencing the desert on a regular basis? While being out on a desert slope just watching the erosive effect while experiencing a Monsoon-season thunderstorm downpour, I decided I would try to monitor the effect of every desert rainstorm; yes, every single storm over a period of a few years. Every time that the weather service would predict precipitation, I would go out to a beautiful field area that I could reach via mountain bike to place cheap sediment traps (roach motels). Then, no matter whether it rained or not, I would have another excuse to go to the field and retrieve those traps. Luck was with me, in that within 3 years, my field area experienced a 1000-year precipitation event to place into a frequency-magnitude perspective all those tiny rainstorms (Dorn, 2015). The research yielded interesting results, but the field experience was far more valuable to me personally.

CONCLUSION

The last several years has seen a number of powerful reflections on the impact of field work, including: 70 years of fieldwork in geography education (France and Haigh, 2018); field work in the 21st century (McSweeney and Winkler-Prins, 2020); 50 years of fieldwork in Latin America (Bein et al., 2020); juggling academic motherhood and field work (Jenkins, 2020); and Phil O'Keefe's (2021) last paper before his death on recollections of a tropical geographer. The authors of this paper echo a sentiment made again and again: fieldwork is life changing. We think all readers should take Carol Harden's (2021: 31) advice: "I encourage all geographers to spend time in the field..."

In an ever-changing world, we also recognize that fieldwork is unique, special, and different to every individual. To some, fieldwork puts them in the middle of a busy, metropolitan center, a remote village, or a rural township. To others, fieldwork puts them in the lab, deep into a census report, or into the bowels of theology. To yet others, still, fieldwork puts them

on the slip face of a dune, the bank of a river, the edge of a glacier, or as a biological bystander. To whatever end, geography embraces the concept of fieldwork, and that the followers of Eratosthenes can offer their own unique, profound, and life-changing experiences to prove it.

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Norma López-Castañeda is a second year PhD student in the School of Geographical Sciences & Urban Planning at Arizona State University. She is interested in human modifications of the earth surface, especially agricultural terraces. She is a Mexican who keeps trying to find a way to live her best in the challenging desert.

Madeline Kelley is a fourth year PhD student in the School of Geographical Sciences & Urban Planning at Arizona State University studying sediment transport. She loves experimenting in wind tunnels and flumes, but also thinks of sand while mountain biking, rafting, hiking, fishing, and any other outdoor activity she can do with her dogs.

Zach Hilgendorf is a fourth year PhD student in the School of Geographical Sciences & Urban Planning at Arizona State University studying dune morphodynamics. He is passionate about biogeomorphic restoration and spends his time thinking about coastal dunes and vegetation. Originally from the Midwest, USA, he currently lives in the desert Southwest, and works on the Pacific Coast.

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Dr. Ron Dorn has been an Assistant, Associate and Professor of Geographical Sciences & Urban Planning at Arizona State University since arriving in 1988. A desert geomorphology,

he has published an entire book on the scum found on rocks (*Rock Coatings*) as well as over 175 articles and book chapters. At 63 years old, he goes out into the desert on a daily basis in search of developing a deeper understanding and appreciation of natural landscapes.

