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Not My Fault: In praise of geology and earth scientists

Lori Dengler for the Times-Standard

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Humboldt Geology students and alums at the 2014 Friends of the Pleistocene field trip.

I had no intention of going into science. In my early teens I wanted to be a jockey and was firmly convinced I would never weigh more than 100 pounds. I quickly exceeded that weight cap and switched my interests to high school drama. Theater beckoned but I had no acting talent. I took four years of math just because my parents said I should, but never talked about math grades because I didn't want anyone to think I was a geek.

I arrived at UC Berkeley in the fall of 1964. Like many freshmen, I had little idea of a major. The excitement of the Free Speech Movement swept over campus early that term and other than being sure we could change the world, I have few memories of the classes I took.

In those days, Berkeley had the enlightened policy of no major declarations until junior year. I dabbled in humanities, tried journalism but decided I didn't like talking to strangers and thought about teaching until I took one Ed course that was dreadful. I loved art history but couldn't see a viable career path. Sciences were required, and took botany my first year and, holding my nose, opted for geology the beginning of the next.

I'm not sure what I expected. I grew up thinking of geology as a dry dusty field where anything of interest had been discovered years ago. Was I ever in for a surprise. Two things conspired to make it a life changing experience. The first was the instructor. Professor

Howell Williams was a volcanologist who uncovered the explosive story of Crater Lake in the 1940s. It was his last year of teaching and as a result of a spat with the department chair, was assigned the "rocks for jocks" class.

Williams' response to the perceived punishment was to teach it just like the majors' intro class. Many of the 600 in the class hated it – nothing like the easy "A" they expected. For me it was wonderful, unveiling a new planet as I had never seen earth before. He emphasized that visualization, aesthetics, and imagination were as important as data and algorithms in understanding geologic processes.

The second factor was an earth sciences revolution. 1964 was the dawning of plate tectonics and Professor Williams was one an early believer. Only a few accepted it at the time, and he gave us a sample of the arguments both pro and con. This was anything but a dead discipline; it was changing before my eyes.

Maybe this was a field worth exploring further. Was it possible three semesters into my college career to switch into a physical science? I cautiously enrolled in chemistry and calc I the next term. I did ok.

Junior year I declared geophysics as my major. Why not geology? Berkeley at the time did not allow women to attend field camp, the capstone class for geology majors. A few women had circumvented the requirement by finding a field camp at another institution, but the practice was discouraged. Geophysics was where many of the plate tectonics debates were happening, and it sounded ok to me.

New technologies in microscopy, chemical analysis, remote sensing, seismology, and many others kept opening new doors and more questions. I entered grad school thinking could I possibly contribute. By the end it was hard to end my thesis because there were still so many unanswered questions to tackle.

At Humboldt, I learned my journey into the earth sciences wasn't very different from the students I worked with. Like me, most had switched after taking a geology class to meet a GE requirement. Geology programs all over the country are similar. In high school, geology is rarely offered and almost never as a college preparatory class. For students who are smitten by the field in their junior or senior year in college, it is often too late. Catching up on prerequisites is daunting and many schools make it difficult to change majors that late in the game.

In 2008 I was part of an NSF-sponsored Earth Science Literacy Project. Our task was to define what everyone should know our planetary home and why it is an interesting field. We spent three months coming up with nine "Big Ideas" to capture why earth science affects you and your activities effect the planet. Here are the three that interested me the most:

- **Humans depend on earth for resources**. Water, air, food, fuel, building materials, electronics – everything that sustains life is related to our planetary environment.
- **Natural hazards pose risks for people.** Earthquakes, floods, storms, droughts, climate change – are the result of earth system processes.

• **Humans significantly alter the earth.** Our activities change ecosystems, the climate, and exacerbate exposure to natural hazards.

It was hoped that the Earth Science Literacy Project would boost interest in geoscience education at both the K-12 and college levels. Alas, it has not. The American Geosciences Institute tracks college enrollments and employment in the U.S. Both undergraduate and graduate enrollments have steadily declined since 2015. It's odd because the job demand has grown throughout this period and as of 2021, 96% of geoscience graduates who earned their degree between 2014-2018 were employed.

All of these trends are in play at Humboldt. We live in one of the most dynamic areas of the U.S. where natural hazards remind us yearly of their importance. Offshore wind development requires an understanding of geologic forces. Geosciences and earth science literacy are essential parts of decision making both personally and as a community. And yet the Geology Department at Cal Poly Humboldt is contracting.

When I arrived in 1978, there were nine tenured faculty and four part timers. Today there are four tenured slots and less than one full part time position. I retired from teaching in 2015 and my position was never replaced. The Natural Disasters course that I taught every semester in 2000s is offered only occasionally. Last week I learned that the BA Geology Degree is on the verge of being eliminated (the BS will continue) and another 5% cut in staffing is in the offing. It's particularly frustrating in light of the Department's growth post COVID.

After Humboldt became a Cal Poly, people would tell me how an exciting opportunity it was for Geology. Alas, earth sciences have not been identified as an essential part of the new University vision. Maybe a little rumble is needed to remind everyone MOTHER EARTH IS IMPORTANT and we all need more geoscientists.

Note: More on the Big Ideas and why earth science is relevant at https://scied.ucar.edu/sites/default/files/2021-10/earth_science_literacy_brochure.pdf

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