Lawrence Sim

Geospatial Software Engineer at the San Francisco Estuary Institute

What is your current occupation?

I am a Geospatial Software Engineer at the San Francisco Estuary Institute (SFEI). We serve many roles in our department, but generally speaking I provide technical expertise in GIS analysis, tool/model development, web development, data processing, and data analysis for a wide range of projects -- with applications ranging from remote sensing of cyanobacteria blooms, to GIS tools for analyzing the ecological effects of landscape changes, to data processing to monitor COVID levels in municipal wastewater, just to give a few examples.

What is your educational background?

I received a BA in Geography from the University of California Santa Barbara with a GIS emphasis, followed up by an MS in Geography from Oregon State University with a graduate GIS certificate. Though I started off at UCSB as a mechanical engineer before switching majors, taking from it some additional technical skills, especially in programming, which carried over significantly in my career path.

A key message for students is that the geoscience workforce is dynamic, and boundaries between sectors and occupations are fluid. How has this been true in your career?

Originally, I wanted to focus on remote sensing with oceanographic applications, for which I took any classes I could in those subjects at UCSB. In grad school, I kind of stumbled into a project for the Dept. of Energy (DOE), developing a model to simulate deepwater oil plumes and spills, which transitioned me heavily into refining my skills at coding, modeling, numerical

analysis, and a lot of hydrocarbon chemistry I had zero prior experience in (well, except how to remove tarballs off your feet with baby oil, a common Santa Barbara problem). After a few years of working for the DOE, I moved to my current position in a water science institute, where I get to apply my technical skills in a variety of different applications -- many of which are outside my scientific expertise – and a larger focus on web-maps and web-applications. While it can be a challenge, it keeps things interesting and new. Though I didn't originally expect to be so heavy on coding/programing, those kinds of widely-applicable technical skills are what allowed me to be adaptable to various types of projects.

Where do you see your sector moving in future years? How would you advise students to prepare to be competitive job applicants and successful employees?

Use of GIS and coding is nearly ubiquitous in environmental jobs and only growing. It's a common thing I've heard lamented by friends/cohorts that they didn't take enough of those classes. Even if not focusing on those things, having some familiarity will go a long way in working in projects involving these things. In general, I'd anecdotally recommend developing similar types of ancillary technical skills. There are so many projects where proficiency in things like web development, graphic design, databases, data QA, etc. come into play. Even if a limited proficiency, these extras stand out, especially in a smaller organization like the one I'm currently in, where we have to wear a lot of different hats.

What is the role of networking in your sector? Do you have advice for a student who is just beginning to build their network? What is the best way for students to get their foot in the door?

I'll be honest, networking is not my forte, but the internet has also made that a lot easier. Maintaining some professional social media presence (GitHub, LinkedIn, personal website or blog, etc.) will help keep your name out there – which is probably especially relevant in the COVID-era. Conferences are also a great opportunity when available, especially during social events that feel less formal. Otherwise, really nurture the connections you make during school. It's the period of life for most people where they make the most friends, and those I've made and kept have been beneficial in immeasurable ways. Besides all the other important reasons to cherish friendships, we share job opportunities with each other, ask each other for advice when we're stumped with something at work, or ask for a referral to someone with the expertise we need.

What does a "typical" day of work look like for you?

I'm always juggling about 3-5+ projects at one time (in addition to maintaining completed, but still active ones), so a typical day generally starts with prioritizing what needs to be done, depending on backlog, incoming deadlines, or what have you. From there it's a mix of coordination with other people on my project and carving out blocks of time to work. Projects vary a lot in terms of what the latter means in terms of coding, GIS, or data

processing/visualization. Most often these days I'm programming in Python or Javascript (occasionally R thrown in the mix, and previously I worked mainly in Java). GIS and remote-sensing libraries/frameworks I use include ArcPy, GDAL/OGR, and Google Earth Engine.

What is the best part of your job?

They allow dogs in our office, which is also right next to an off-leash dog park, so while I don't have a dog personally, I got to interact with them almost daily. But, being more serious, the two things I love about my current job are being in the non-profit sector and wide variety of projects I get to work in. I find the non-profit world to personally fit my style best, somewhere in between private and government sector in terms of pacing, as well as getting to enjoy being a workplace with a strong, environmentally-minded ethos. And the wide variety of different projects I can get pulled into keeps things interesting and feeling like I'm always learning new things.

Do you have any other comments or advice for students looking to enter your sector of the geoscience workforce?

For me personally, the trick has been maintaining a balance between being adaptable and open to change while not losing sight of my larger goals. What I thought I would be doing when I was in undergrad, what I did in grad school, what I'm doing now, it's all in the same sphere of geoscience, but the specific focus areas have drifted around in ways I never expected. And many folks I know have experienced similarly meandering paths in the careers. At the same time, I started wanting to get into oceanographic applications, and being in a water science non-profit now, while not exactly the same, I haven't strayed from that vision too much, which brings me a lot of satisfaction in my career.

Connect:

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Learn more:

A sampling of projects I've recently worked on:
- https://fhab.sfei.org/
- https://ecoatlas.org/
- https://explorer.adaptingtorisingtides.org/home
- https://www.sfei.org/projects/delta-landscapes-scenario-planning-tool
- https://map.hidden-nature.org/home