



## GEOINFORMATICS | EDITORIAL

# Women in Geoscience: An interview with Michele Tobias

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Additional information is available at  
the end of the article

**Figure 1. Michele Tobias.**

### About you

#### 1. *What is your background and experience? How did you get to the role that you are in today?*



I'm a geographer—I have a BA & PhD in geography and an MS in ecology. I've specialized in geospatial methods and mainly work now with open source tools. My current job (Spatial Data Curator at the UC Davis Library) requires expertise in many software packages and methods for GIS and remote sensing, as well as many data formats. I work with people from pretty much any field that works with spatial data in formulating methods and learning skills they need. I think my curiosity and interest in any kind of spatial data is what has brought me to my current position.

#### 2. *What made you decide to be a geoscientist?*

I became a geoscientist mainly because of the methods. It's the methods that help me answer questions I'm interested in. I've always been fascinated with why anything is where it is on the earth.

### Research

#### 3. *What is your specialism and what do you enjoy most about working in your research area?*

I'm a coastal plant biogeographer and biogeomorphologist. My ecosystem of interest—the sandy beach—is deceptively complex. Most sandy beaches only have a few species of plants in any given community, the plants are very short and spaced far apart, but the interactions between the plants themselves and the physical environment are complex. One of my favourite tools to work with in this environment is my kite aerial photography rig for taking low altitude air photos. It is ideal for windy coastal environments with low vegetation. It lets me get a birds-eye view of the system, which is in some ways a unique opportunity since the plants are so short.

#### 4. *What topics are you currently interested in learning more about? Are you following any research developments in particular?*

I've always been interested in applications of aerial photography so the increased availability of low altitude and DIY imaging systems like drones is something I've been keeping up with. I'm curious to see how the regulations that are starting to develop around drone use will restrict access for researchers.

#### 5. *What do you plan to research next?*

I have some great photo sets from a number of beaches, but the more straight forward image classification methods have been less than useful for automatically identifying plants at the species level. I plan to start exploring more sophisticated classification methods like machine learning.

**Figure 2. Fieldwork: studying the sandy beach.**



### **Women in Geoscience**

**6. *Why should more young people continue with the study and profession of STEM subjects? Do you have any messages or advice for them?***

You don't have to decide between art and science. STEM subjects involve a much higher degree of creativity than most people realize. As a kid, I identified more as a creative mind than a math or science mind, but as I got older, I started to appreciate how much creativity is required for analysis and really found my place in the field of geography where I can do both.

**7. *How can geoscientists around the world support girls in pursuing STEM subjects, in particular geoscience?***

We need to stop presenting girls and women in STEM as a sideshow or curiosity. The stories we tell about women in STEM are often related to them succeeding in spite of being female. That's the wrong message to send to everyone, not just girls. The only reason being female is a barrier is because our culture has made it one. It's not a fact of being female.

**8. *Have you had to overcome any gender barriers in your career?***

The barriers are certainly there but I don't know that I've overcome them. The gender barriers only change how I get recognized for what I accomplish and how difficult it is to make progress, but not what I actually accomplish. Women in GIS, as with many fields, have to work harder to be accepted as being an expert or making significant contributions. A common assumption I hear at conferences is that I'm there to visit the conference city while my significant other is there to present, even if I'm wearing the conference badge. A colleague that I had known for several years through a regional GIS meeting was surprised to find out I had a PhD and that I code.

**Figure 3. Fieldwork as a coastal plant biogeographer.**



### General questions

**9. To you, what is the biggest geoscience question that needs answering?**

It probably sounds like I'm taking the easy way out, but climate change and human population growth affect almost everything we study as geoscientists.

**10. What are your biggest concerns for the future within the geoscience field?**

In the US, I see the political trends towards not trusting and not funding science as a major threat.

**11. What has been the greatest challenge that you have faced or continue to face in your career?**

Publishing is challenging for all early career scientists. When I submit a paper I immediately get search engine hits on my website and online profiles. It makes me think that reviewers are taking other aspects of my career into account than the paper I've submitted. I would like to see journals try having a non-blind review process. I think it would encourage people to view the paper review process more as colleagues helping colleagues present their research in the best way possible than the current adversarial system where reviewers can hide behind anonymity.

**12. Who or what inspires you?**

Edith Purer's body of work in the 1930s documenting and describing the ecology and geography of dune plants in southern California has been one source of inspiration for a while now. Her paper with diagrams of the distribution and geometry of plant roots in the sand is incredible—meticulous drawings of roots—and helped me formulate some of my work. To know that she was able to accomplish all of this in the 1930s as a woman is also inspiring.

Currently I draw much of my inspiration from the Open Source Geospatial Foundation (OSGeo)/ Free & Open Source for Geospatial (FOSS4G) and Women in GIS communities. The people in these community help each other without question or expectation of anything in return and are excited to see innovative work by other people. The OSGeo/FOSS4G community is one of the reasons I take the time to write blog posts on how I solved technical problems in my work and why I teach workshops at conferences and on campus. I want to give back to this community that has helped me so many times.

### 13. How can others find you online and follow your activities?

I am on twitter @MicheleTobias and my research website links to a number of projects and code repositories I'm currently involved in: <https://sites.google.com/site/mtobiasresearch/>

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