

Four Reasons Why All Geoscientists Should Do Fieldwork

Tim van Emmerik¹

1. Delft University of Technology, The Netherlands

Streams of Thought post - published September 2015

Fieldwork?

As geoscientists we often visit strange and distant places to collect data that will help answer science questions and interrogate hypotheses. In an airport, we are easily recognized: hiking shoes, too many checked bags (read: cases with equipment), malaria medication, and a letter from your professor stating that “all your activities will be strictly in the name of science”. Fieldwork can be exciting, horrible, enlightening, disappointing, surprising, or simply a complete failure.

So, why put ourselves through so much trouble? Can’t we just get our data from sources that already out there? At the time of writing I’m flying back from, and reflecting upon, an intense fieldwork campaign in the deep jungle of the Brazilian Amazon. During this campaign I joined a team of experienced researchers to install heaps of sensors on skyscraper-sized trees. With these sensors we hope to accurately monitor the mass changes in trees, and how this is affected by water stress in the dry season.

Having survived tarantulas, language barriers, and man-eating mosquitoes, I’d like to use this post to share four reasons why we, as geoscientists, benefit from getting our hands dirty, and collecting our own data in the field.

1. You know where your data comes from

Is it a good idea to blindly download and use data from a random server or website? In many cases, it is. Many trustworthy institutes and databases provide a wealth of free and publicly available biophysical data, for example, the U.S. National Science Foundation’s Long-Term Ecological Research (LTER) Network. These second-hand data can help force and constrain physical models, and assist with cross-site compar-

ative analyses. However, using second-hand data leaves you at the mercy of metadata for understanding the quality and particularities of the data set. When you collect data in the field yourself, you can be confident of the who, what, where, why, and when of a data set. You are aware of the advantages and the flaws of your methods, and can quantify the accuracy, precision, and potential errors associated with the equipment you are using.

2. You might learn new skills

Fieldwork for geoscientists mostly involves characterizing and quantifying several physical attributes of a field site. This might sound easier than it actually is. The reason for my Amazonian adventure was to install twenty sensors on twenty different trees, to monitor mass changes over time. Doesn’t sound too difficult, right? You find a tree and a ladder, you go up, and you stick your sensor on the tree. Well, the trees in the upper canopy layer of the Amazon are between 30 and 60 meters tall, and they tend to be the habitat of gigantic man-eating insects, jaguars, snakes et al.

I knew this already (tip: always prepare for your fieldwork), and I made sure to bring a group of experienced tree climbers along. However, things never really work out as you plan them, and half way into the fieldwork campaign all of the climbers were either gone or injured. So what did I do? I learned to climb myself! When installing equipment I find it important to do as many things as I can myself. This gives me independence, allows for some physical exercise, and provides me with a better idea of the status of my sensors. For example, I know exactly how many sensors I installed at the wrong height, at the wrong side of the tree, or without batteries.



From a neighbouring flux tower 20m doesn't look so high, but it is (the white dot is me)



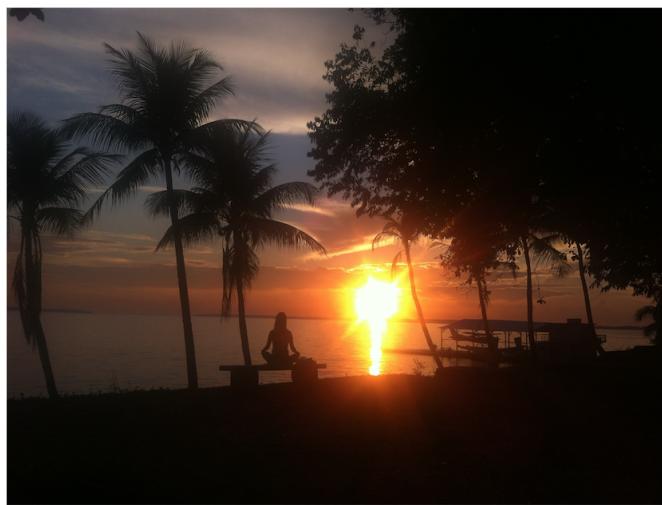
Maybe a fifth reason: the joy of returning to the civilized world.

3. You might learn new languages

Throughout my early career, fieldwork campaigns have taken me across four continents. As a global lingua franca is still missing, every now and then I wind-up working with people with whom I share no common language. Talking with my ?hands and feet? is always one solution, but I prefer to try to acquire the ability to speak in the native language. Not only because my motor skills aren?t what they used to be, also because being able to converse is in my opinion the best way to convey and receive messages. Besides, being able to speak Khmer, Ashanti or Portuguese in the field is never an asset to be ashamed of.

4. You will understand your research better

Many of the early scientists who described and quantified the hydro- and biosphere of our planet did so based on observations. I believe empirical research is, and will always remain, one of the cardinal and irreplaceable aspects of our field. Of course, (complex) models and remote sensing are great tools that allow us to understand processes better, but what would they be worth without observations? How can you understand the governing hydrological processes in a catchment better than just go there during a rain event? If you want to know what water stress does to vegetation, why not find some plants and stop giving them water? Also, multiple data sources can help us constrain our rainfall-runoff models.



Maybe a fifth reason: the joy of returning to the civilized world.

So...

...even when your whole campaign fails, and you end up with corrupted (or without) data, you are very

likely to have learned something about the physical world and walk away with some new life skills. If nothing else, fieldwork is a fantastic reason to get away from your computer monitor and leave that small, dark, mouldy, sweaty office.

Want to get prepared? Indulge yourself in some fieldwork reading material: a recent paper by Philippe Vidon on why we, young hydrologists, should focus more on fieldwork (Vidon, 2015) , and an enlightening novel by Dutch author W.F. Hermans on perhaps how not to do fieldwork (Hermans, 1966).

Citation: van Emmerik, T. (2015), Four Reasons Why All Geoscientists Should Do Fieldwork, *Streams of Thought (Young Hydrologic Society)*, Published September 2015, doi: 10.5281/zenodo.58084

About the author

Tim van Emmerik is a PhD student at the Water Resources Section, Delft University of Technology, the Netherlands, AGU Student Representative, and co-founder of the Young Hydrologic Society.

References

Hermans, W. F. (1966), Beyond Sleep, The Overlook Press, New York.

Vidon, P. G.-F. (2015), Field Hydrologists Needed: A call for young hydrologists to (re)-focus on field studies, *Hydrol. Process.*, doi:10.1002/hyp.10614