Here we outline a plan to assist the UNHCR with research to determine the resilience of different refugee camp’s water supplies to climate change. We seek to understand the effect that bedrock and regolith properties have on infiltration versus runoff generation during storm events. We will explore which regolith properties affect infiltration to unconfined, near surface aquifers and how this infiltration is affected by hydrograph shape. This research could assist in determining where to sit wells to support refugee populations and which existing wells are at risk of failure. These topics are novel and do not infringe on the research Ellen Milnes’ research group at the University of Neuchatel is doing. These data can be used to answer the following research questions:  1) What specific camps/areas are sensitive to climate change? 2) What is the likely magnitude of the effects of climate change on water supply on those areas? 3) What mitigation measures might be applied in these specific areas? We plan to develop a model in Landlab to determine how changes in regolith/bedrock properties affect the ratio of infiltration to runoff during a storm. We will generate climate projections and reconstruct realistic hydrographs and storm frequencies for different camps. We use this model to determine how the ratio of infiltration to runoff is affected by 1) the shape of the hydrograph, 2) storm frequency, 3) topography, and 4) land use and urbanization. We can involve organizations like UNHCR, IGRAC, the critical zone observatory, and UNESCO.

**Fine print**: UNHCR and IGRAC both have mentioned that they could pay for fieldwork or costs to go to relevant conferences. I believe this could be a modeling/data mining project but UNHCR has mentioned field work. I am not sure the spatial scale this project will be at. Could it be something I develop in the guads as a test site and apply to someplace that the UNHCR is working in (Northern Colombia, Lebanon, Sudan, etc.)? This project is way “more blurry” than the other. I am totally willing to switch this project up but wanted to start thinking of ideas. I think I will be more efficient if I work on both the next two projects at once.

I was also thinking that another project could be on using machine learning to identify zones of weathering. Using remote sensing to identify weathered zones was something that came up in conversations with IGRAC/UNHCR/Neuchatel. It was an idea to try and use remotely sensed data to better identify zones of water infiltration.