Idea spitball:

1. I need a problem to answer. What’s the motivation for this?
2. Near surface groundwater, unconfined aquifers
3. Effect of climate change on groundwater for refugee populations
   1. Water balance
   2. amount of people supported and how that could change with climate
4. Landlab modeling with validation
   1. Model of topographic effect on groundwater flow
   2. Maybe change in bedrock properties
      1. Different bedrock properties
      2. Concrete, urbanization = no infiltration
      3. This could play off other project (flash flooding)
         1. Build infiltration, different rock properties (substrate) response to precip events
   3. Model for water balance
      1. How climate change could influence number of refugees can be supported
      2. Specific to location? Or global analysis
5. Effect of topo on groundwater
6. Model ratio of infiltration to runoff in different substrates. Change in climate (shape and frequency of hydrograph) should affect this. Develop model in guads, Lebanon, Colombia, brazil, ie areas the UNHCR is working in. data mine and field work?
7. In huang and niemann paper, ‘scapes with higher infiltration (uniform across ‘scape) have more relief because less surface water runoff. Seems weird cause in reality, hard rock landscapes may have less infiltration. Storm size and including infiltration causes a discrepancy between the much used Q vs A relationaship.
   1. Differences in urbanization ? change in “n”?

Involve:

1. UNHCR
2. Neuchatel
3. Crit zone obs
4. Landlab (modeling)
5. Governments of countries im working in
6. JAXA

Places I want to be-

**Colombia**

**Lebanon**

**Turkey**

Brazil

Timeline-

2020:

1. Summer: research, choose site (Lebanon, Turkey, Colombia seem likely), start writing draft proposals, **decide on research questions**, contact relevant orgs/people
2. Fall: go to den haag wash thing to meet relevant players, hone in on ideas, write solid proposal

2021: Field season, learn language (summer)