Raw Thought Process (direct from notes)

* What is the soil composition of Bears Ears National Monument?
  + What plants would grow with different amounts of precipitation & where in elevation? Woody plants book
    - Megadrought ecology= 25% decrease in expected amount of precipitation over a period of decades (20yrs)
      * So what is the current amount of precipitation that Bears Ears receives?
        + I can overlay this information on elevation and use gradients to show precipitation based on current data and show what plants grow there. (Compare a drought to normal amount of precipitation)
* Perennial streams = use the data we have from the map; examine the areas that have known springs connected to perennial streams.
  + How much precipitation do they receive in that area?
  + What is the flow rate?
    - Essentially, when does an ephemeral stream turn into a perennial stream? What would the required amount of precipitation for that to happen?
  + Support this with stable isotopes and CFC data to date the water.
    - Why didn’t we filter the water? I couldn’t answer that question from a fellow undergrad
    - Check out level 2 spring inventory protocol Chan-Wiener equation-diversity impact ---- (thought of this after David Sinclair’s talk)
    - Could we predict where new springs could be based on geochemical models (Zac Weathers talk)? Could we predict where new settlements could be?
    - Could also check out the water quality from the springs that we sampled & see if we have any data that we can add to springsdata.org (David Sinclair)
* Soil
  + Use USGS soil maps on top of a DEM
  + Would the soil change if the hydrography changed? Where does the water flow & what is the deposition like? Can we look back in time and see where the water went & why Anasazi left?
    - Probably could use the link I sent Emerman with the streams
  + Could support this with soil samples from areas around the springs.
* Plants
  + Based on available water, soil type, elevation & time, what kinds of plants could be present? Can we support our findings with dendrochronology & dating phytoliths from plants around springs?
    - Can we see if grazing had anything to do with species richness around the springs during the time that the Anasazi left the area? Was there other pressure besides the megadrought? Lack of forage available by the springs? 🡪(thought of this after David Sinclair’s talk)
    - Phytoliths (Camilla Crifo)
      * She is working on IDing specific plants during specific climates using their phytoliths. Working on more specific methods for accurate dating
    - Dendrochronology (Deborah Woodcock)
      * Research fellow. Met her husband at a tour and we chatted. Would be useful to have her expertise.

Goal: Can we make a map or a program that can determine this information with elevation, lat & long & a time component so we can choose what area to see and in what time in geologic history? Similar to waterisotopes.org? How do we relate this knowledge to the present (Conflict of Bears Ears: protect the past or the future? Que no los dos?)? Can we determine when a megadrought will happen based on this data?🡪 This is how we fund the rest of the research. Make maps based off of current data from last 30-40 years, then apply that information to the past to predict future data.