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CE 394K TERM PROJECT – Project Update

**The Response of Different Soil Types to Precipitation Events over Contrasting Soil Moisture Conditions**

Numerous factors can influence the fraction of precipitation that becomes runoff impacting the ground surface such as: land use type, soil type, precipitation type and intensity, and initial soil water content among other less significant factors. In this study I intend to quantify the how different soil types react to precipitation events of varying intensity and timing. I have proposed to investigate 3 different areas, each representing a unique soil type. I am choosing different Long Term Ecological Research (LTER) sites to use as my locations because these areas are often part of long term ongoing research projects that normally have meteorological, small stream gauge measurement, and soil moisture data sets at short enough time intervals to assess the impact of weekly rainfall events. Although runoff can be influenced by a number of factors, this test will study will look to hold all others nearly equal while varying soil type and soil water content. Since LTER's are largely undisturbed natural environments, land use type should not be a large issue. Cases will also be compared where initial water contents are similar across the 3 sites before similar rainfall patterns studied. At each location I will need each of the following set of data to complete the analysis:

1.) Local subwatershed area data
2.) Local stream fetch data: length, daily flow rates
3.) Local Elevation data
4.) Local soil types distribution data.
5.) Daily meteorological data for each site
6.) Soil water content values prior to and preceding rainfall events.

Work to Date:

In order to define the geographic locations of my study, reliable and persistent soil moisture data sets needed to be acquired, because these are the most difficult data sets to find. I have chosen the following locations based on the robustness of their data sets:

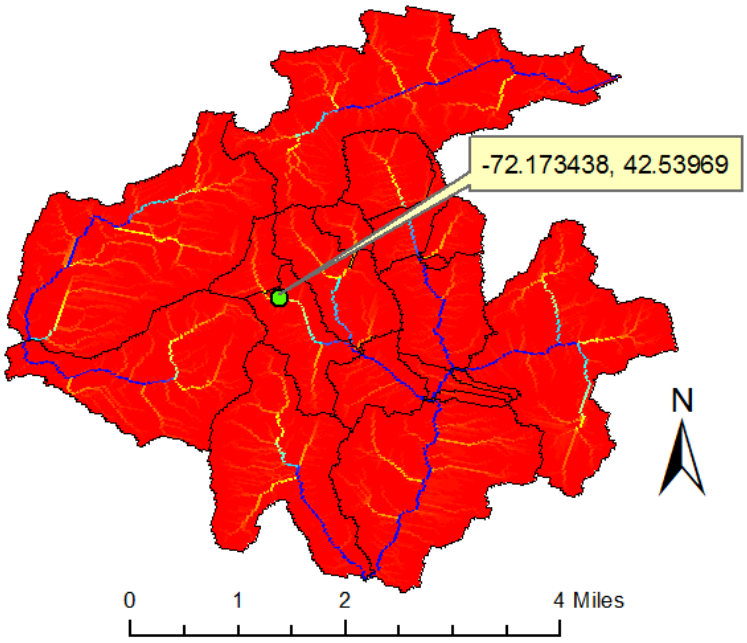
1.) Harvard Forest LTER (MA)
2.) Coweeta LTER (NC)
3.) Sevilleta LTER (NM)

1.) Each LTER (Harvard Forest, Coweeta, and Sevilleta.

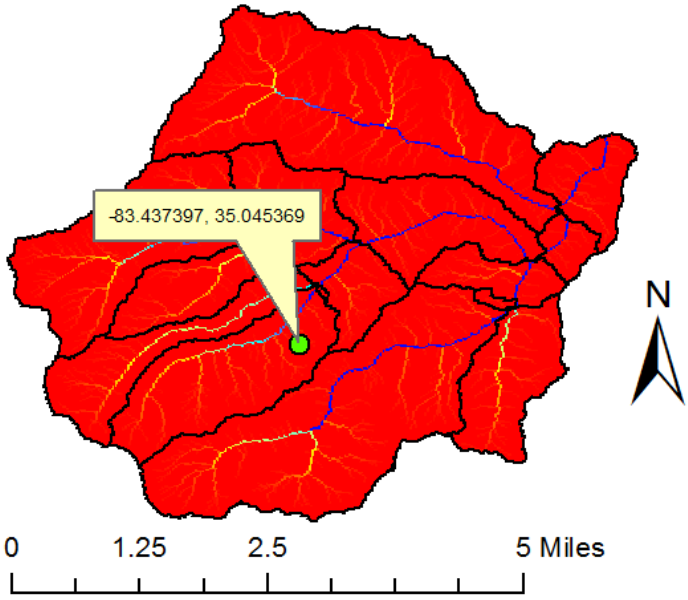
I have downloaded data layers from NDHPlus for the small catchments draining the land beneath the study site. Elevation data, flow accumulation, fetch length, and catchment area have

been added and masked to the designated catchment areas. The Meteorological Tower is represented as a green circle with corresponding coordinates.

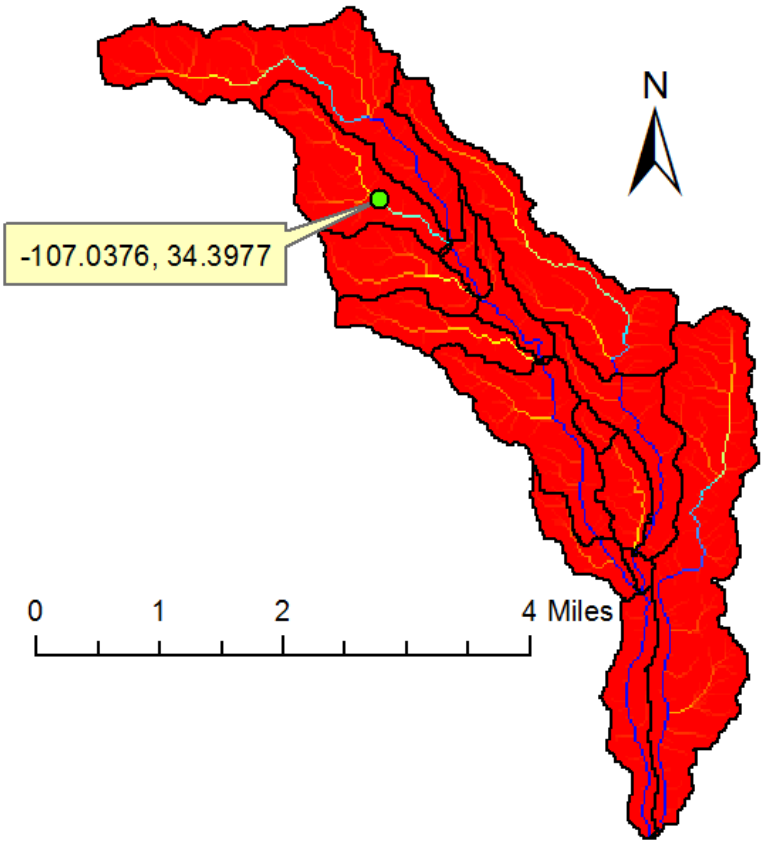
Harvard Forest LTER




Coweeta LTER



Sevilleta LTER




Upcoming Task/Issues:

1. In order to calculate runoff over my desired area, I will need stream gauges at the lowest elevation of the stream system within my catchment area. Unfortunately stream gauge data through these regions are fairly sparse. I may need to find another method to calculate runoff.

2. I need to covert .kmz files into a workable form to use in ArcMap. Currently, the soil type data I am using are .kmz files within GoogleEarth. I would like to display this image in ArcMap and be able to quantify or visually assess how much of the catchment area is representative of one type of soil.

3. I will determine how each of the soils react to the same type of precipitation event. I will need to browse NARR data from NCDC to find similar rain events for each catchment. This timing will provide me with the time period in which to analyze the soil moisture and stream flow for each catchment and fetch.

4. Additionally I may need to redefine my particular catchment area for the Sevilleta due to the angle of hill slope within the one depicted and because of the dates in which the soil moisture data were collected (1992) and the units of moisture are measured in (bars) instead of volumetric water content (g/g).