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GISWR Term Project Proposal
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Basemap construction in the Eastern Cordillera, Colombia: glacial geomorphology, hydrogen isotope distribution, and soil mapping

My term project will focus on my area of graduate research: the Eastern Cordillera of Colombia. The main goal of the project is to integrate the data I have already collected from the field sites and data that is currently being generated in the lab into ArcGIS for effective spatial representation and analysis. My project will be based on the following datasets:

- 1:100,000 topographic maps purchased from Colombian geographic survey of field areas of interest
 - Chingaza National Park
 - Sierra Nevada El Cocuy
 - Sierra Nevada Santa Marta
 - Nevada del Huila
 - Santa Isabella
 - Cumbal
- Water depth point measurement for Laguna Chingaza
- Rough bathymetry for Laguna Cumbal
- Soil type data for watersheds of lakes of interest
- GPS tracks from glacial moraines in Chingaza National Park
 - Potential cosmogenic dates from moraines
- Historical ice cover extent from Santa Marta and El Cocuy
 - 1850 to present
- Published precipitation amount data for Eastern Cordillera
- Vegetation and stream water hydrogen isotope data (if analyses completed)
- Soil temperature data

The first objective of this project will be to generate DEMs of my field areas from digital copies of topographic maps. I would also like to delineate watersheds of lakes I am actively researching. Also, I plan to map the glacial geomorphology of Chingaza National Park from collected GPS tracks on glacial moraines. This area is quite interesting because there are several apparently recent glacial moraines, but no present day ice. A secondary goal with this part of the project would be to model the path of glacial ice to the terminal moraine down the glacial valley. I will convert historical observations of glacial ice extent from Santa Marta and El Cocuy into Arc shapefiles. Also, I will create bathymetric maps of Laguna Chingaza and Laguna Cumbal. The final goal of the project (tentative based on generation of data this fall in our stable isotope lab), is to map precipitation amounts, soil temperature, stream water hydrogen isotope ratios and vegetation hydrogen isotope ratios. This will be used in upcoming publications that seek to address uncertainties of the environmental controls on hydrogen isotope fractionations in terrestrial leaf waxes. I will attempt to investigate the spatial patterns (or correlations) between the stream water and vegetation hydrogen isotopes.

