**Activity: Comparison of Soil Organic Carbon by Land Use**

Use data from two soils from the same area within the Christina River Basin Critical Zone Observatory to investigate how different land use histories influence soil properties. One soil is forested and one soil has been used for agriculture. Use the data to compare bulk density, clay content and the organic carbon content of the agriculture soil and forested soil. Refer to Yoo et al. (2011) for background history of the site and results of empirical data collection.

Yoo, K., Junling J., Aufdenkampe A., and Klaminder J. 2011. Rates of soil mixing and associated carbon fluxes in a forest versus tilled agricultural field: Implications for modeling the soil carbon cycle. J. Geophys. Res. 116:G01014. doi: 10.1029/20102JG001304

1. Plot bulk density, clay content, and soil organic carbon content as a function of depth for the agriculture and forest soil. Remember to label all axes and include units.
2. What are the similarities and differences between the two soils based on evidence from your plots?
3. Why do you think these similarities or differences exist based on evidence from your plots?
4. Calculate the total soil organic carbon storage (kg m-2) in the agriculture and forest soil. Show your work and be careful to convert units.
5. Which soil stores more organic carbon? Why? Provide at least one testable hypothesis.
6. What do these data say about global carbon soil stocks as more land is converted to agriculture?