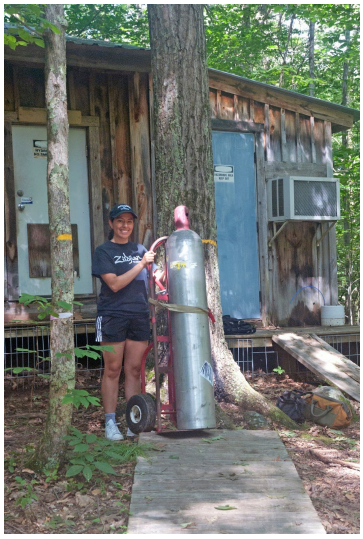
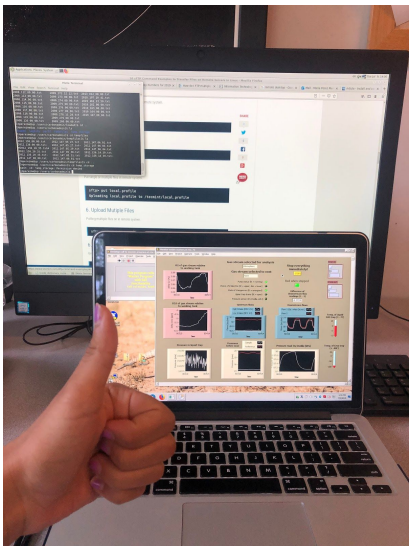
Oxygen and CO2 Measurements at Harvard Forest
Maria Perez Mendoza, Class of 2021



The Harvard Forest Project is an ongoing project under the direction of Professor Mark O. Battle. It focuses on taking measurements of atmospheric oxygen and carbon dioxide at Harvard Forest to quantify carbon fluxes for the landfill portion of the carbon budget. The instrument was installed in August of 2005 and had been continuously collecting data until a lightning strike in 2013. Last year it was refurbished and re-installed but it was not collecting continuous data until this year. This summer I worked on data transfer, data quality testing, and hardware placements. Essentially, I diagnosed the issues present and troubleshot in order to continue the process of data collection.

The biggest quirk for this project is the fact that the instrument itself is in a remote location: Harvard Forest is a about a 3 hour drive from Bowdoin's campus. Because it is not efficient to continue making trips back and forth, Prof. Battle has utilized Remote Desktop Access. This application allows us to troubleshoot and maintain the instrument running despite the challenges that distance presents. Because the HF computer is in a remote location, we need to transfer the files collected at HF to Bowdoin's servers to further analyze. This summer I spent a good amount of time troubleshooting connections with data transfer IP addresses (from HF and Bowdoin) and ensuring that the files transferred without interruption on a daily basis with scheduled tasks. In that case of incomplete transfers, I would then do them manually.



Once the data is in Bowdoin's network, we then run some of the data quality analysis. We run calculation code that we've collected over the years to make the difference of differences calculation. Last year, Diana Grandas '20 worked on a pressure correction code to correct for equipment limitations. She finished her own code last summer, and I essentially picked up where she left off to implement her code into the routine calculations and test if it truly makes a difference to have it in, if it harms any other data, or if it's not necessary to implement it.

The last two weeks of my fellowship I spent some time debugging Diana's code to the point of finally making two data tables: one with pressure corrected data and another one with non pressure corrected data. I found that the differences between the respective values within each table is significantly large, but I was unable to find out whether this difference meant something positive.

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