Weather data for the tree phenology project was pulled from Daymet which can produce climate variables on the day level for a 1km x 1km square; Day Length, Precipitation, Solar Radiation, Snow Water Equivalent, Max Temp, Min Temp, Vapor Pressure. Additionally we derived the variables Mean Temp, Accumulated Growing Degree Days(Base 10C), Temp Differential, and Total Spring Precipitation for the year. The following steps will lead you through our steps to produce a csv file.

**Download Data**

Option 1: Download data through the user interface on the Daymet web page

– requires account

1. Navigate to the Daymet single pixel extraction webpage. <https://daymet.ornl.gov/single-pixel/>
2. Move the arrow to the center of MSU campus or enter the coordinates:
   1. Latitude = 42.7255 Longitude = -84.4805
3. Select “All” Variables
4. Input the desired date range.
5. Sign in to download the data.

Option 2: Download data with wget command

1. Open your terminal and navigate to the folder where you want the data to be stored
2. Execute the following command with the appropriate variables:
   1. Where Red is the location, green is the selected variables equivalent to “All”, and blue is the date range.

wget --content-disposition 'https://daymet.ornl.gov/single-pixel/api/data?**lat=42.7255&lon=-84.4805**&vars=**dayl,prcp,srad,swe,tmax,tmin,vp**&**start=1990-01-01&end=2021-12-31**'

1. Note that you can also input your desired parameters in the singe pixel extraction tool and it will generate a wget command for you to copy and paste into the terminal.

**Data processing:**

Add the following traits using excel programming to supplement Daymet data; mean\_temp, gdd\_tf, gdd, temp\_diff, spring\_precip.

1. Mean\_temp → =(tmax + tmin)/2
2. gdd\_tf(Growing Degree Days base 10C boolean indicator to help calculate gdd) → =IF(mean\_temp > 10, TRUE, FALSE)
3. gdd(Accumulated gdd for that year) → =IF(gdd\_tf==TRUE, gdd = (mean\_temp-10 + value from cell above, Copy the cell above if False), manually set to 0 at the start of each year.
4. Temp\_differential → =tmax-tmin
5. Spring\_precipitation → Set to 0 at the start of the year. For days representing spring(March1 - May 31, corresponding to days 60 to 151 on all years except leap) sum up precipitation and paste to every day in that year. The following site may be helpful.
   1. <https://miniwebtool.com/day-of-year-calendar/?year=2022>