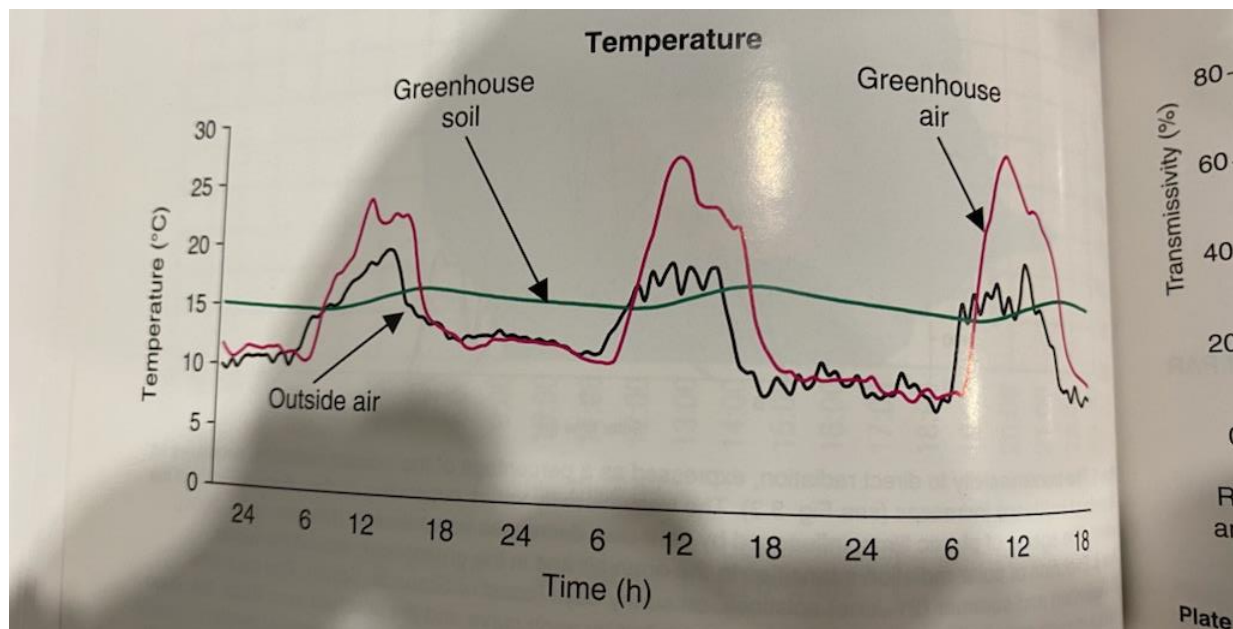


Tableau Dashboard Analysis

Gavin Rowsell

The first graph shows the inside and outside temperatures over time for the first week of the summer growing period (July-August 2019). The relationship shown is a result of the method implemented to generate realistic uncontrolled greenhouse temperature measurements. The graph I was provided with is shown below and shows similar behaviour. The first day in this graph there was more cloud cover which decreased over the following two days. On the third day we see the internal temperature of the greenhouse peaks at noon and dies off as the sun sets. The main noticeable difference between this real data and the data I created is slower evening fall of the internal temperature. With the method I implemented there is more of a balance back to the external temperature in the evening with the synthetic data than there is with the real data. The real data shows more of a lasting effect of the higher internal temperature into the evening than the synthetic data. If I were to obtain real measurements for my model they would likely show this trend as well, the greenhouse absorbs the sun's energy easily which the synthetic data is able to emulate however the more gradual decay of this stored energy is not well emulated with the current method.



Looking at the other features we can gain some information on the weather specific to the Windsor region. It seems that the wind speed typically picks up and peaks around 3 PM and is rather calm in the morning and evening. If we kept the nighttime datapoints there may be more wind at night, but the graph seems to suggest more calmer nights which would be good for maintaining any heat stored during the day. If we look at the average wind speed in various directions, we can see that the strongest winds seem to blow South-Southwest so anyone looking to build a greenhouse in this area

may want to keep that in mind when deciding the orientation of the greenhouse. For natural ventilation it is good to make use of the wind but probably not wise to allow the strongest winds to blow directly into your vents. From this graph we can assume that the best place to put vents would be so wind blowing East-Northeast go directly into your vents. That way you are still getting some natural wind you can use to your advantage while avoiding the stronger gusts that blow by. Finally, we have a graph showing the cloud cover of the sky during the various hours of the daytime. The Windsor region is known to be an important part of the agricultural sector and we can see in this graph that there is plenty of clear skies to promote crop growth in the area. I was surprised to see that after the overwhelming number of clear sky instances the next two highest were cloudy and mostly cloudy. I expected either partly cloudy or thunder to be the second highest. From this I am assuming there are frequent instances of light to moderate rain which provides the soil and plants with adequate hydration before quickly transitioning back to clear skies.