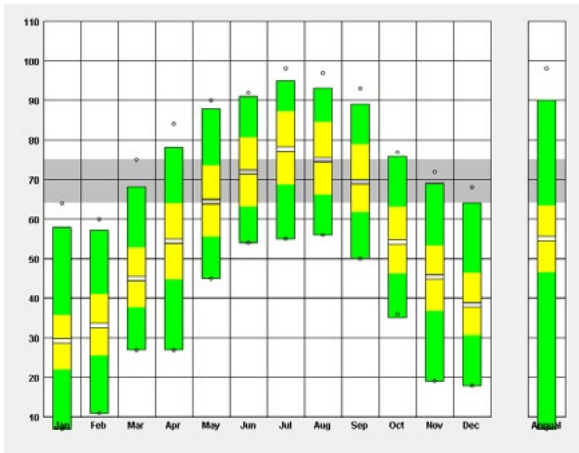


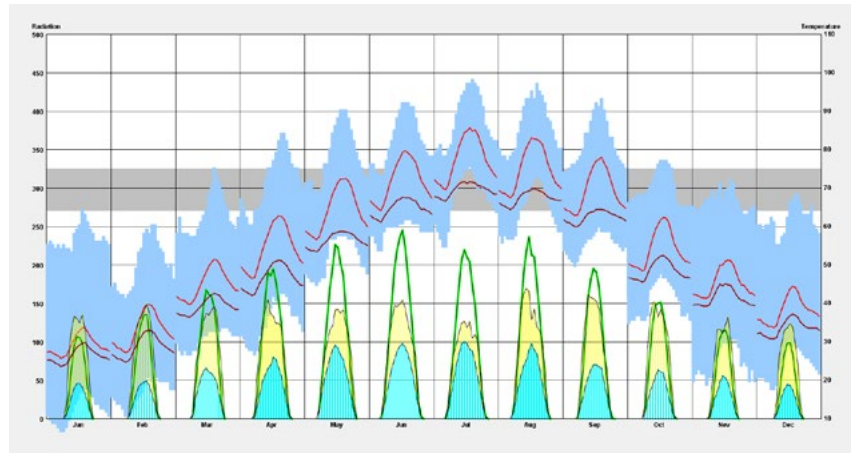
WEATHER REPORT

PHILADELPHIA

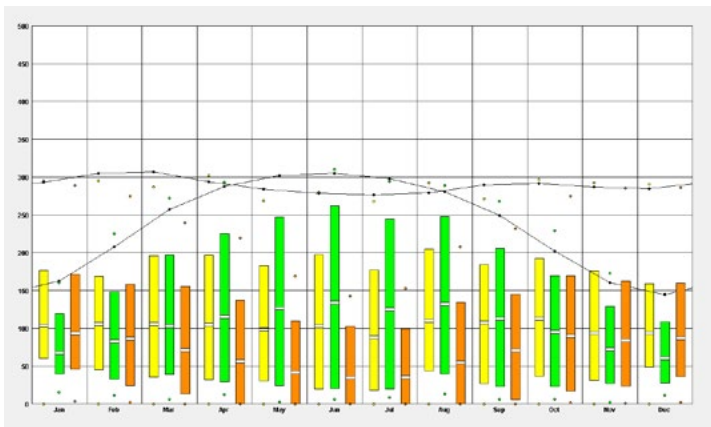
Yuchen LIU



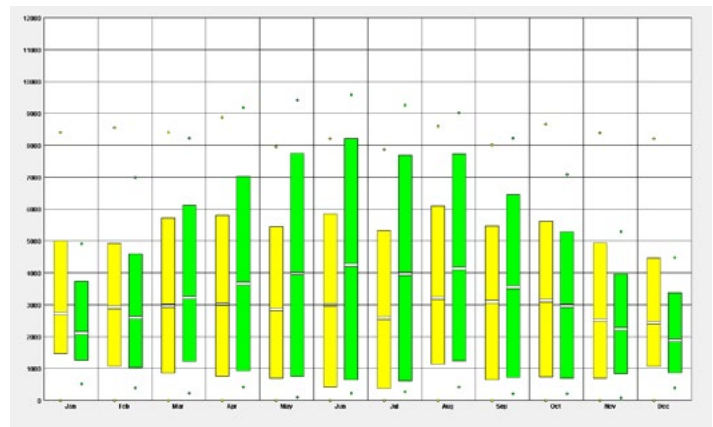
Temperature is below the comfort zone most time of the year. May - Sept is comforting compare to other months.



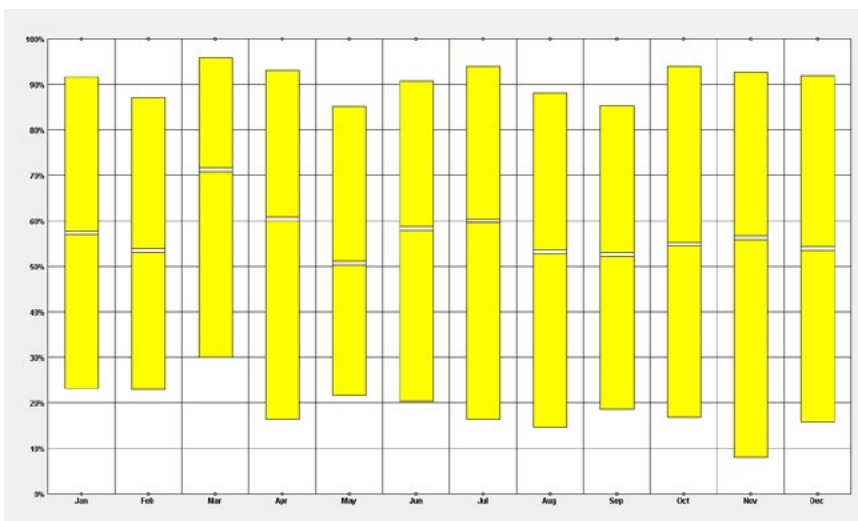
The air temperature is comforting mostly in from May - Sept.



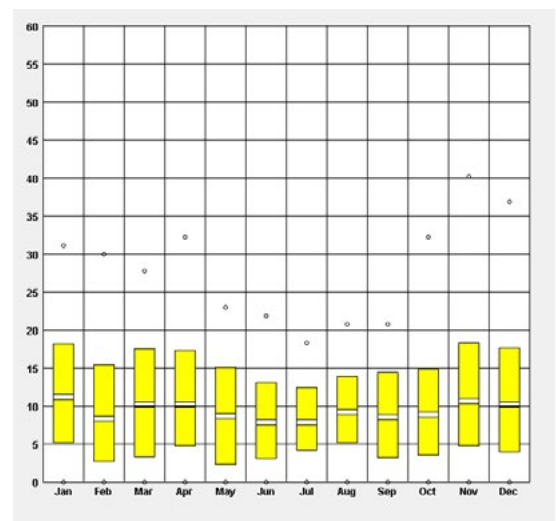
Radiation is getting higher in summer and lower in winter.



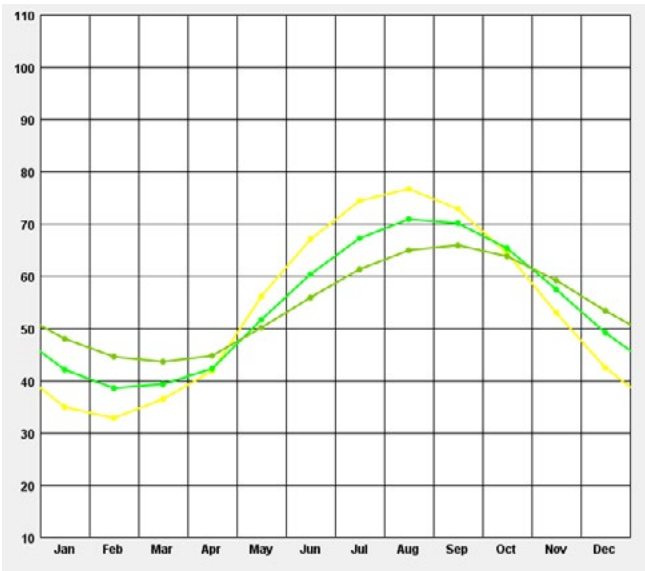
Illumination is getting higher in summer and lower in winter.



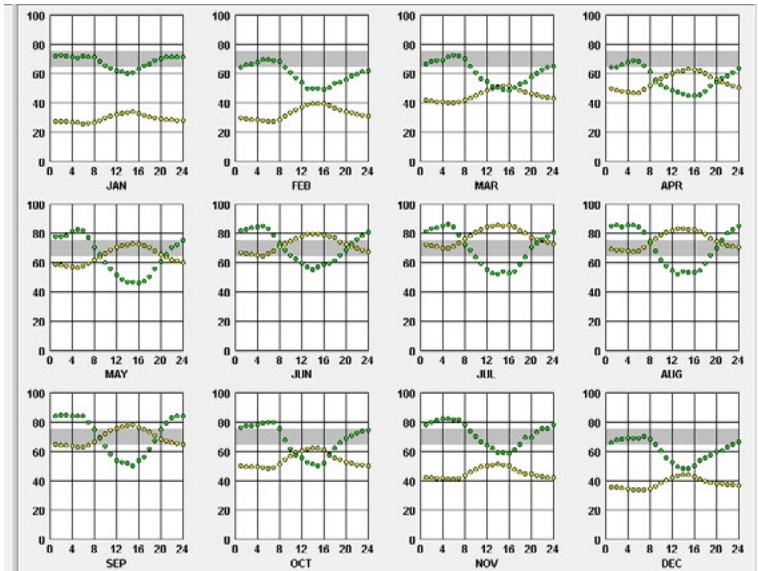
The average coverage of sky by clouds is around 50% -60% during the year.



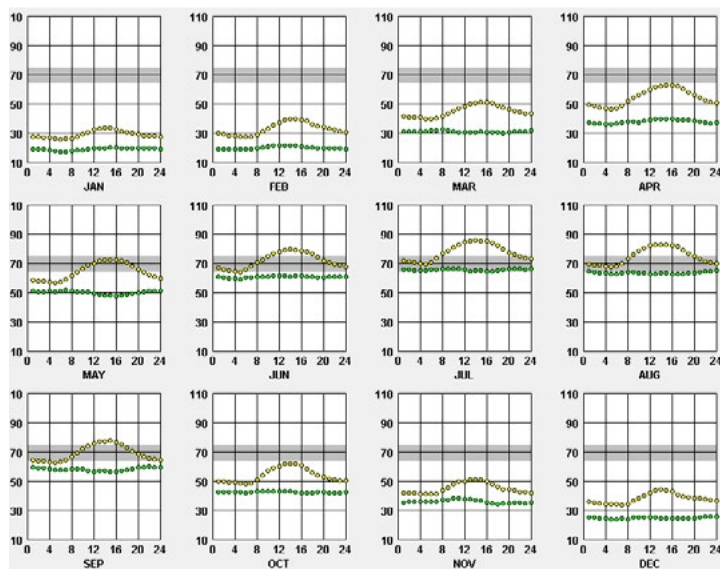
The annual average of the wind speed is around 10mph which is 4.47 m/s. The wind speed in Philadelphia is good for natural ventilation (openings) on building designs.



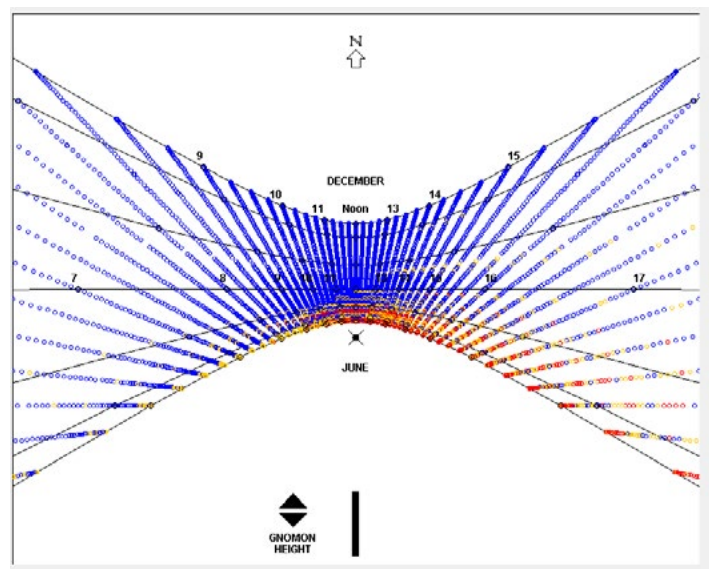
The ground temperature is comforting in July, Aug and Sept, which is around 70 F.



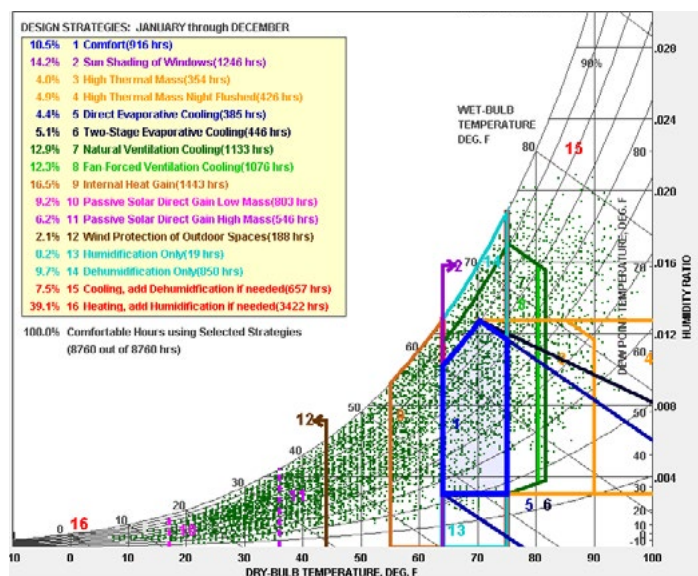
Relative humidity seems always around the comforting zone around the year.



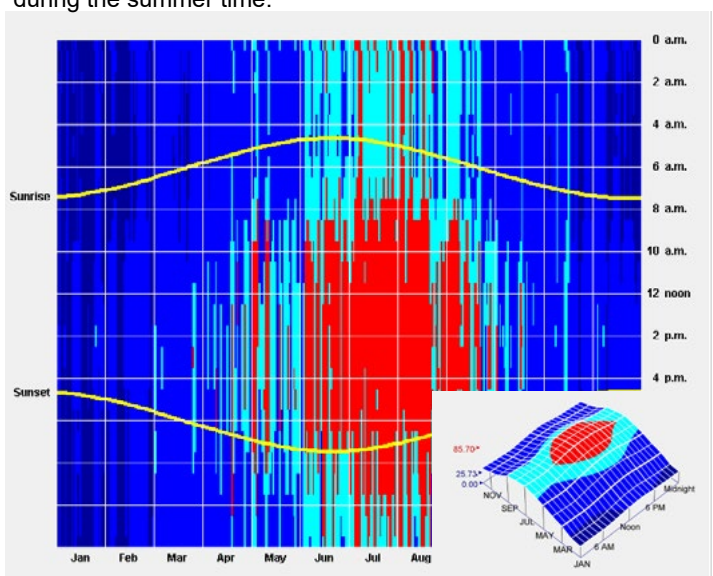
Dew point is always below the dry bulb.



Indoor heating is need during the winter. Shading is needed during the summer time.



Strategies of getting most of the comforting time around a year. Heating and humidification is device is the most effective way to increase the comforting time.



64% of the year is under cold weather, 14% of the year is under hot weather. This means heating is more important than cooling.

DESIGN STRATEGY

1. For outdoor design, air temperature, humidity and radiation are the key element that effect the comfort of people. Besides that, how long people going to stay at outside and the temperature difference between inside and outside also going to affect the comfort feeling. Urban geometry also going to affect the comfort of outdoor space. There is no way for outdoor space to be 100% comfortable.
2. Wind is not reliable, cross ventilation increase indoor comfort as long as the ventilation is controlled and subject of a comfortable outdoor temperature. Other than that, surrounding buildings and other context has to be considered as they will all impact to the access to wind. The speed of the wind also need to be considered, if the wind is too much in city, vegetation can be used to shelter the building from harsh winds.
3. Solar radiation analysis is very useful for passive heating , daylighting and energy generation. Radiation values can help with mass orientation and program position in building. Radiation is come from everywhere, block the visible light does not mean block the heat. Operable sun shading is good for adjust the energy receive from given surface during given time.
4. Humidity can be just as important as temperature for human comfort. Too much humidity can amplify the heat, not enough humidity can be uncomfortably dry. Humidity can affect the passive heating or cooling strategies. Controlling humidity is an important part of design. Humidity is also important for building envelope design. The dew point could be an issue if not well designed.