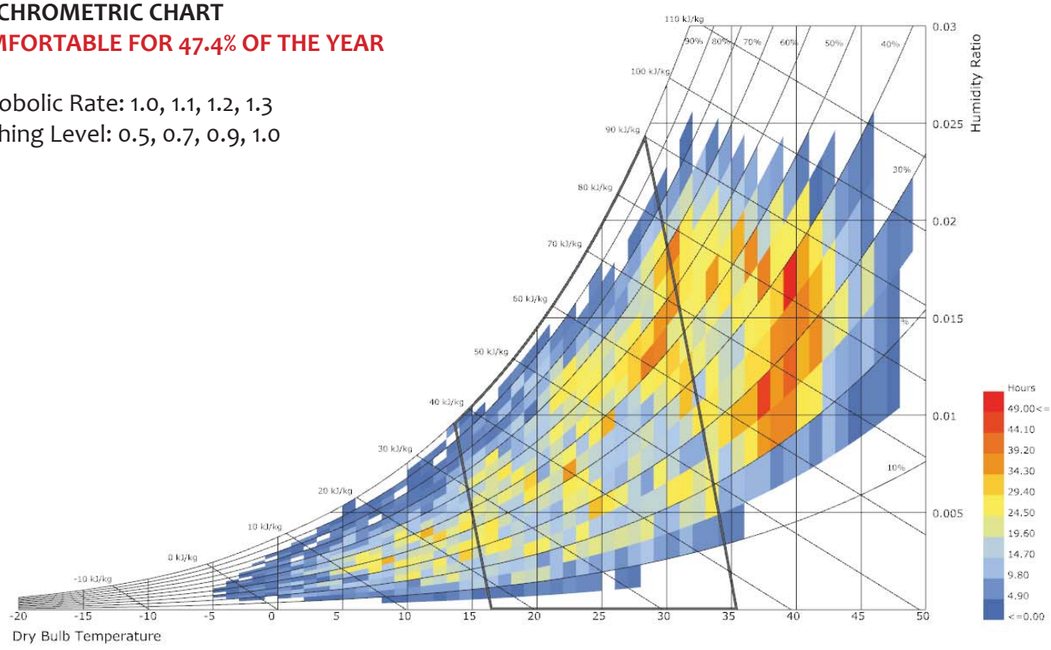
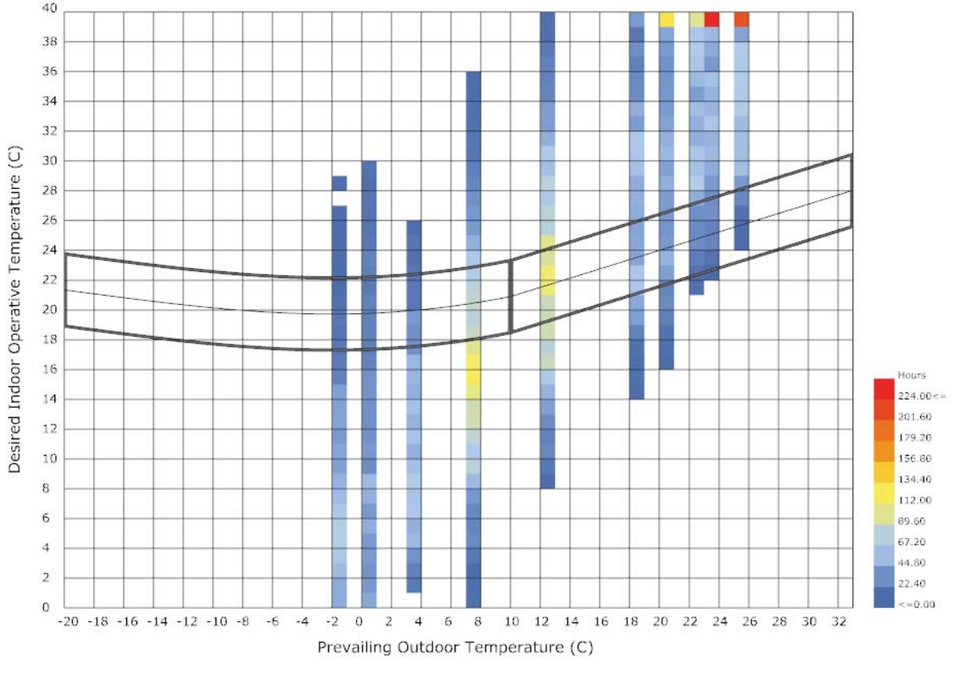
PSYCHROMETRIC CHART
COMFORTABLE FOR 47.4% OF THE YEAR

Metobolic Rate: 1.0, 1.1, 1.2, 1.3
Clothing Level: 0.5, 0.7, 0.9, 1.0

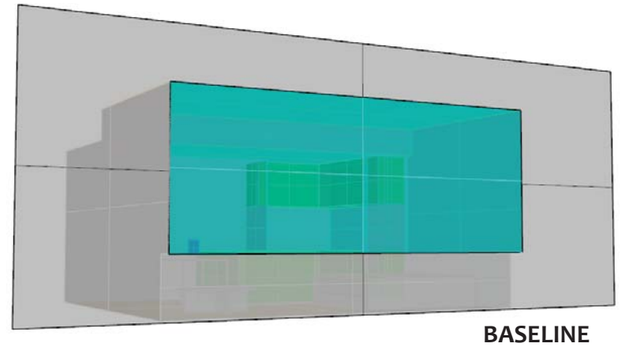




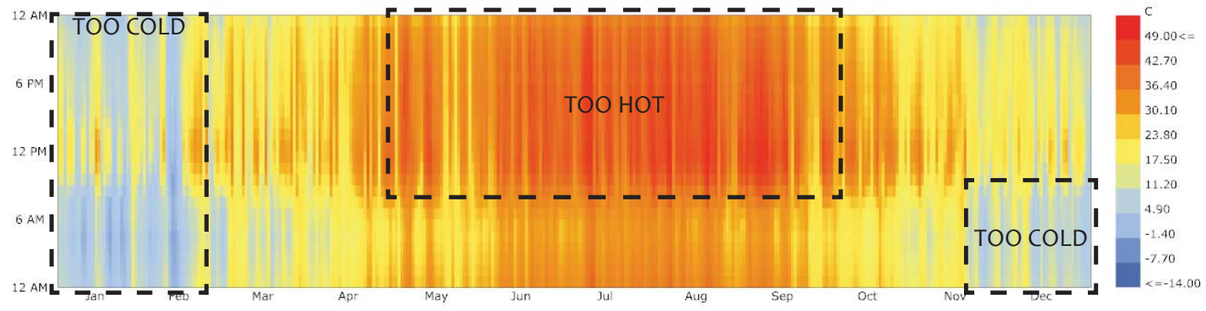
ADAPTIVE COMFORT CHART
COMFORTABLE FOR 17.2% OF THE YEAR

Too Hot: 44.3%
Too Cold: 38.4%

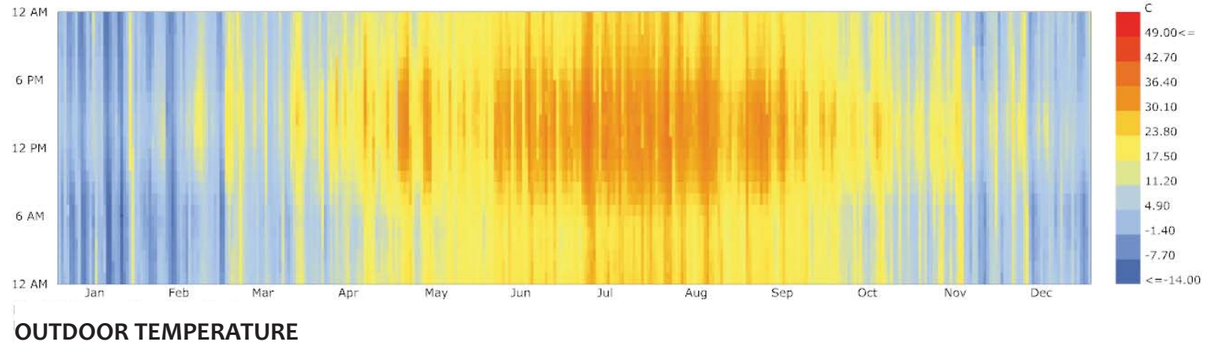
Based on baseline simulations of a residential unit, one that is open to all external conditions (i.e. no adiabatic surfaces), it is clear that the baseline condition will require some mechanical intervention. To avoid energy use for space conditioning and to provide comfort it is important to understand the conditions over the course of the year that are causing discomfort. Based on internal solar gain and outdoor temperatures, it is clear heat in the summer is an issue, so the first thing to take into consideration is providing some ventilation, as well as, providing shade.



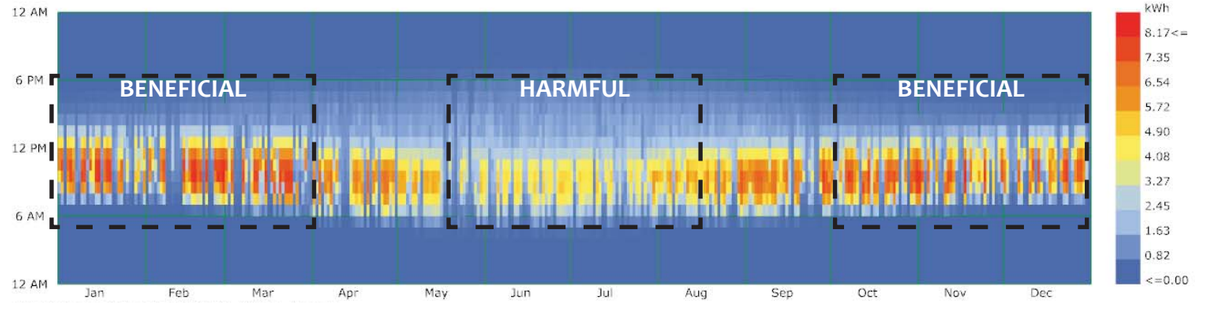
BASELINE



INDOOR TEMPERATURE



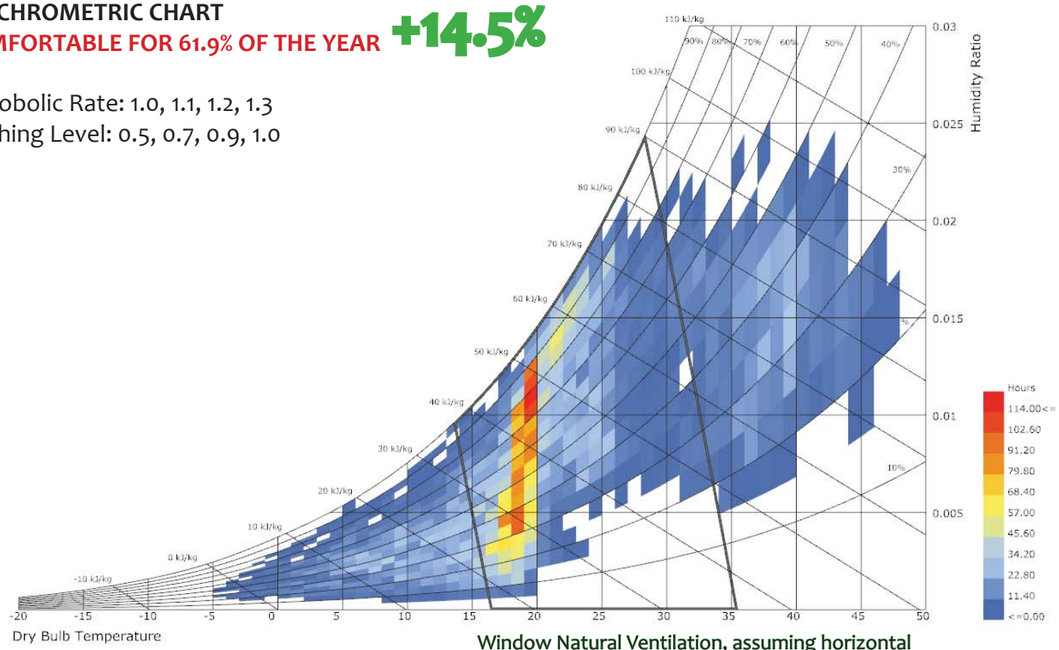
OUTDOOR TEMPERATURE



INTERNAL SOLAR GAIN

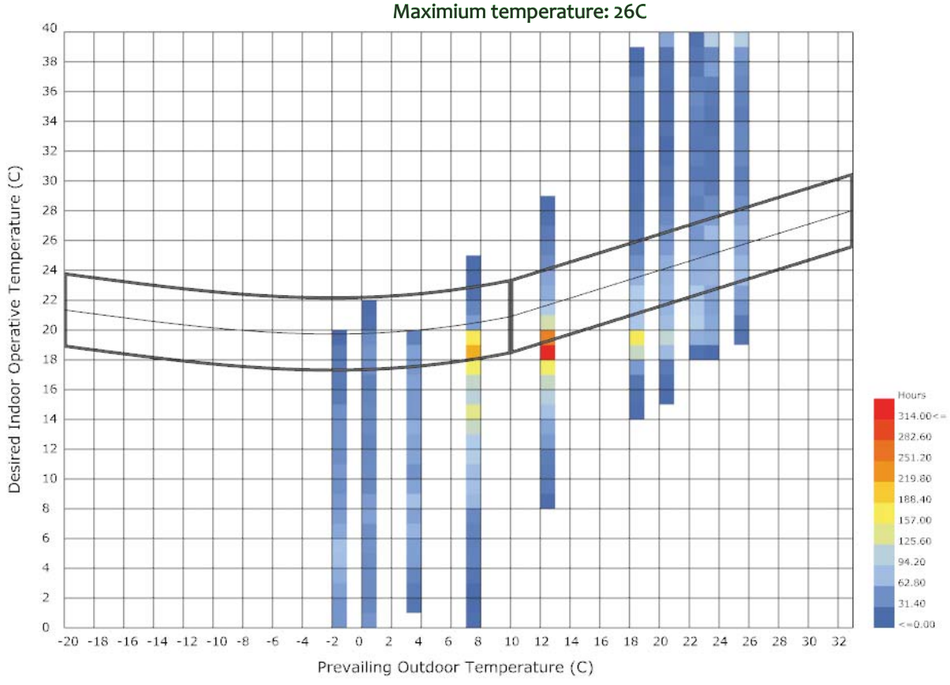
PSYCHROMETRIC CHART
COMFORTABLE FOR 61.9% OF THE YEAR **+14.5%**

Metobolic Rate: 1.0, 1.1, 1.2, 1.3
Clothing Level: 0.5, 0.7, 0.9, 1.0



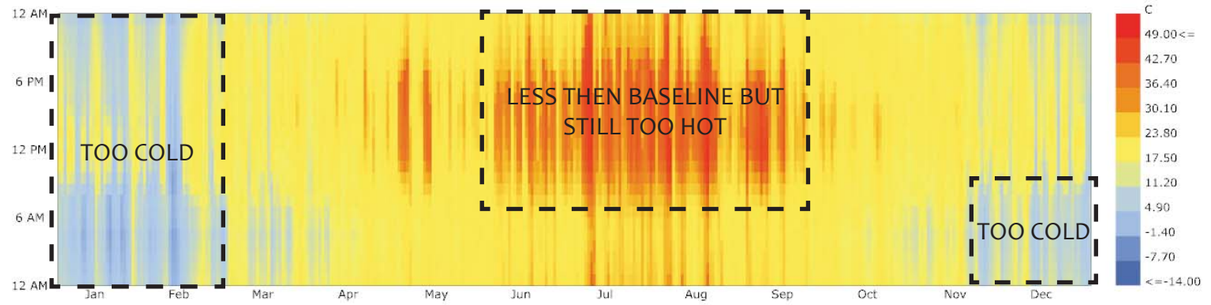
WITH VENTILATION

Window Natural Ventilation, assuming horizontal sliders@50% open
Minimum temperature: 20C
Maximium temperature: 26C



+10.6% **ADAPTIVE COMFORT CHART**
COMFORTABLE FOR 27.8% OF THE YEAR

Too Hot: 14.3% **-30%**
Too Cold: 58% **+19.6%**



INDOOR TEMPERATURE

WITH SHADE

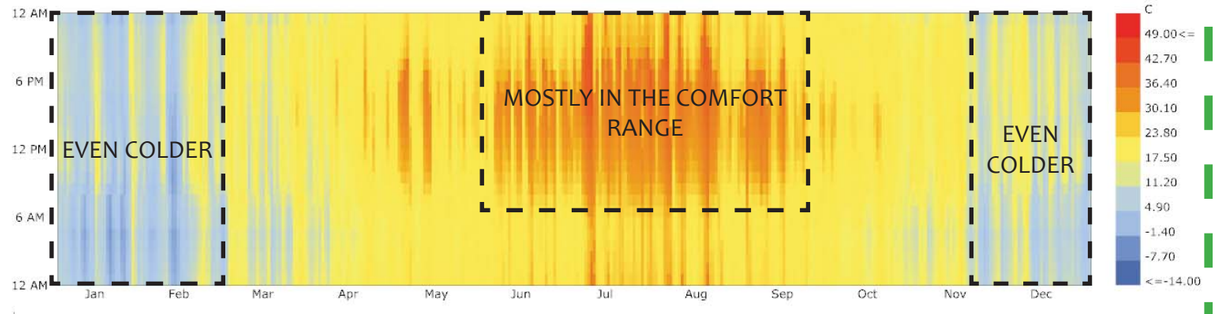
Turns out while adding shade helps with the heat gain in the summer, it makes it much colder in the wintertime when the solar gain would be beneficial resulting in more people feeling too cold during the year.

SO the question this week is how do we make the building retain its heat using this simulation tool? I assume increasing insulation would be the way to go, but the question for the final assignment is how to go about doing that?

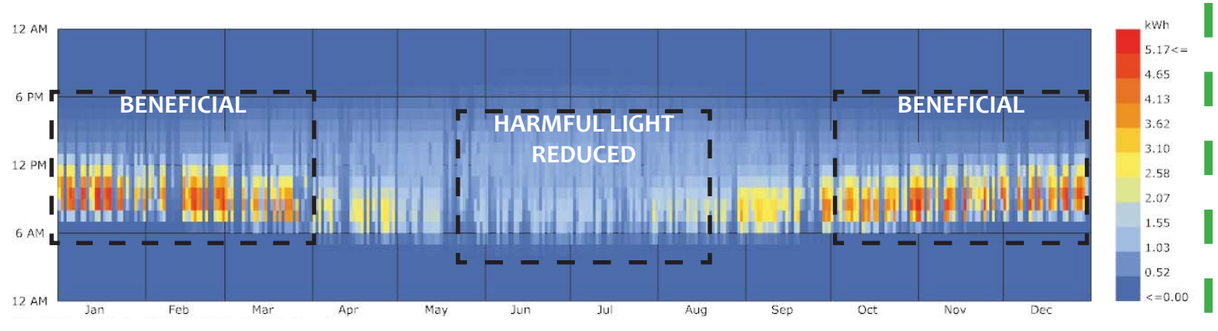
PSYCHROMETRIC CHART
COMFORTABLE FOR 59.3% OF THE YEAR **- 2.6%**

ADAPTIVE COMFORT CHART
COMFORTABLE FOR 23.35% OF THE YEAR **- 4.5%**

Too Hot: 10.7% **+3.6%**
Too Cold: 65.9% **-7.9%**



INDOOR TEMPERATURE



INTERNAL SOLAR GAIN