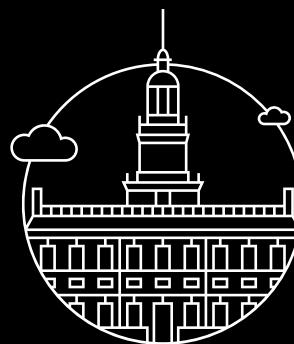


Assignment 4 | Outdoor Comfort Calculation

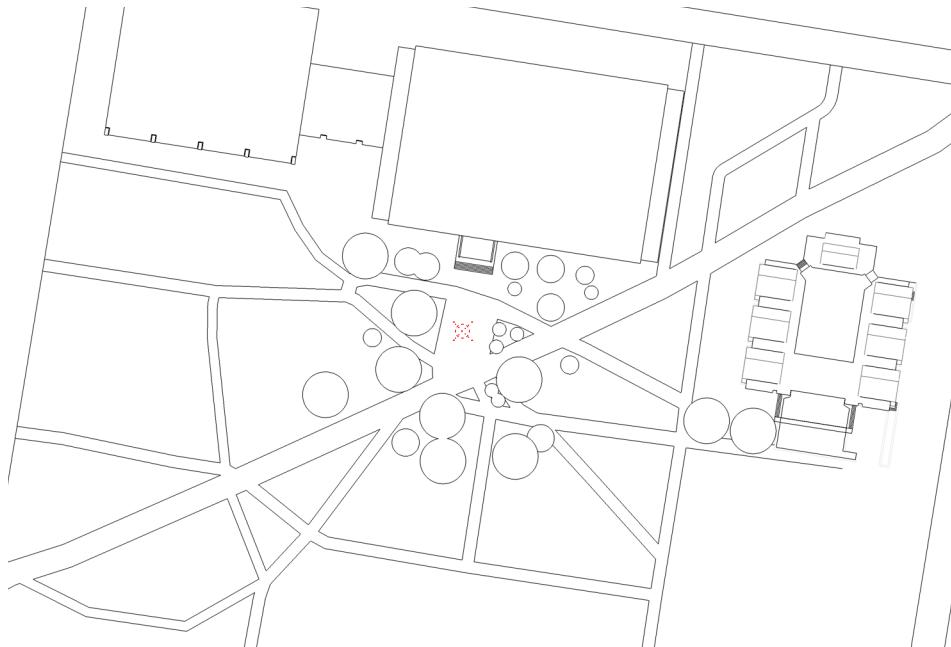
PennDesign
Environmental Systems I
Fall 2017
Andrew Matia



39.87° N | 75.23° W

Outdoor Comfort Simulation | **Base Model**

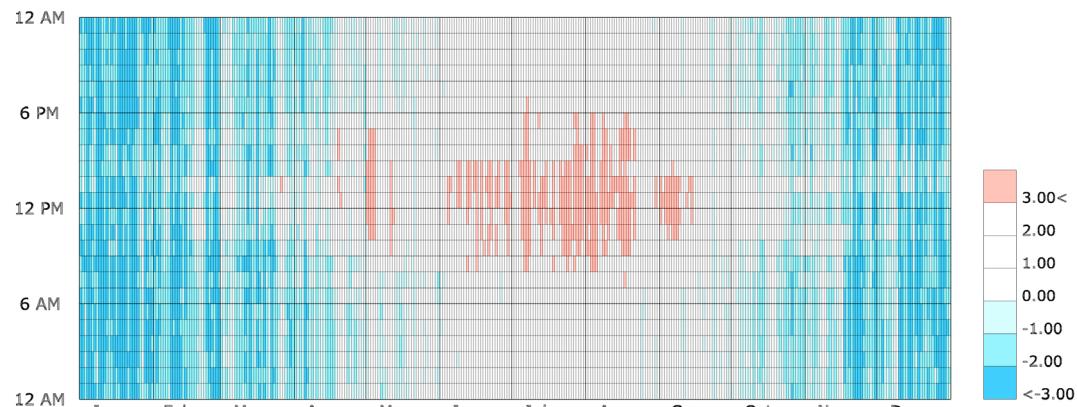
Plan



Perspective



Outdoor Comfort Graph



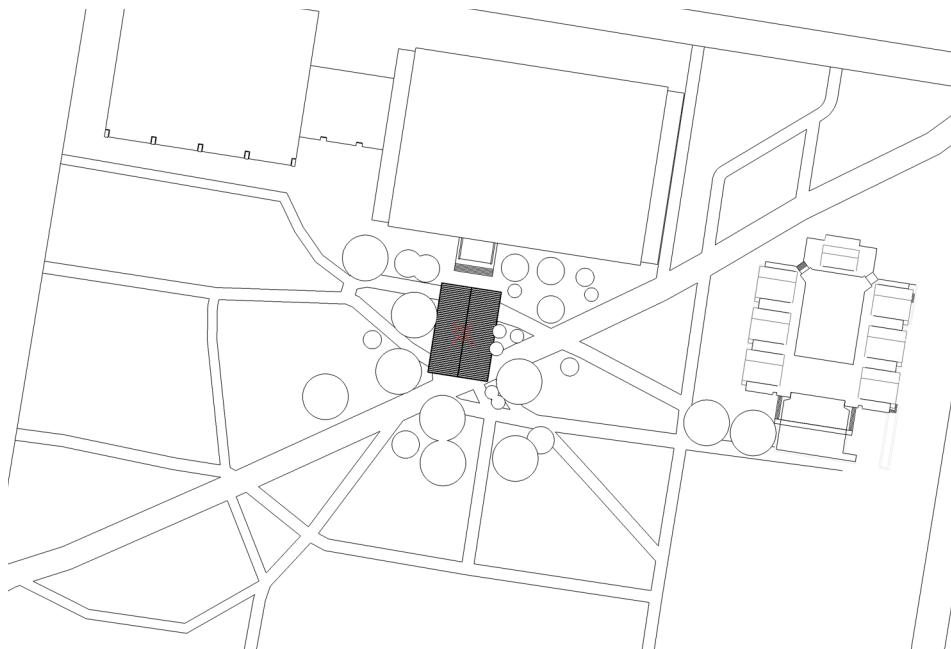
Outdoor Comfort (-3 = Extreme Cold | -2 = Cold | -1 = Cool | 0 = Comfort | 1 = Warm | 2 = Hot | 3 = Extreme Heat) - Hourly
Philadelphia International Ap_PA_USA

1 JAN 1:00 - 31 DEC 24:00

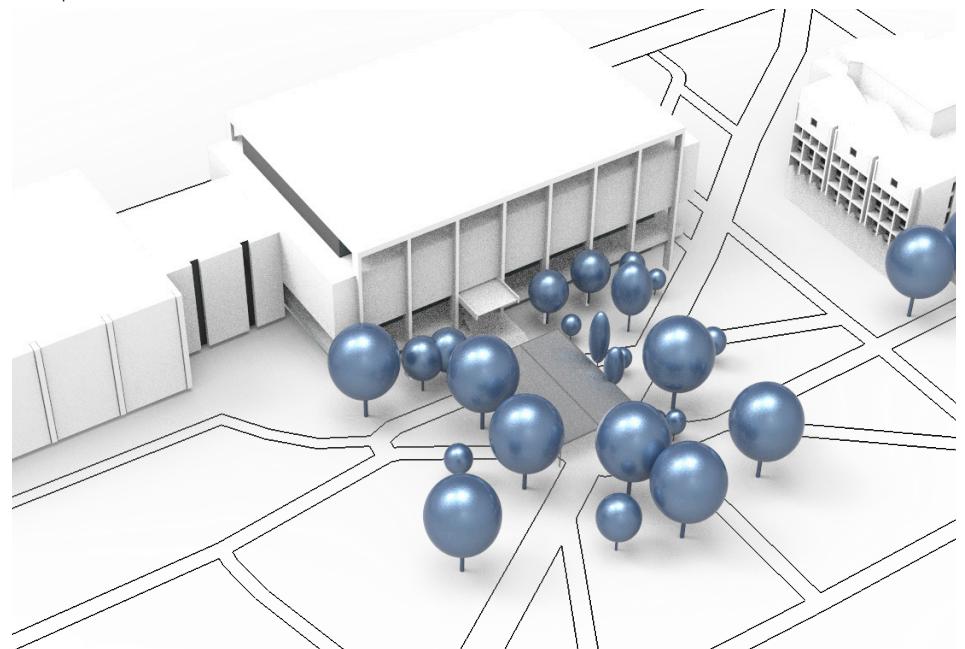
Comfortable: 38.33%; Short period comf.: 19.86%; Heat stress: 8.46%; Cold stress: 33.34%

Outdoor Comfort Simulation | Design Option 1

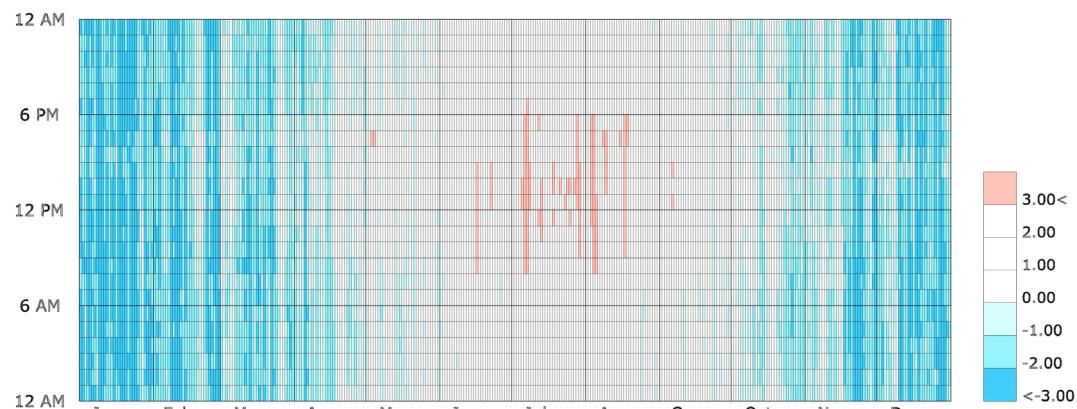
Plan



Perspective



Outdoor Comfort Graph



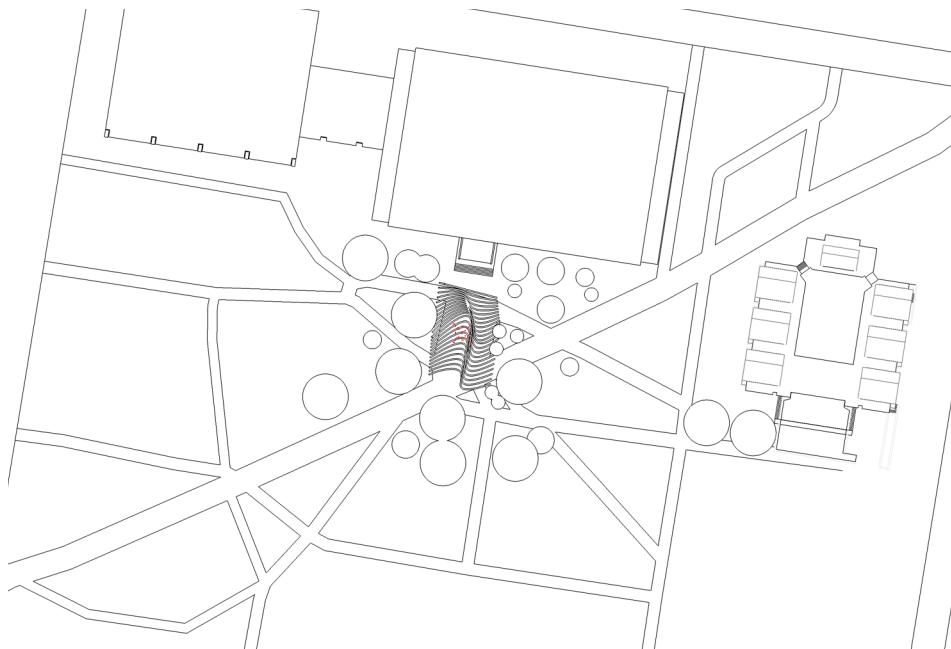
Outdoor Comfort (-3 = Extreme Cold | -2 = Cold | -1 = Cool | 0 = Comfort | 1 = Warm | 2 = Hot | 3 = Extreme Heat) - Hourly
Philadelphia International Ap_PA_USA

1 JAN 1:00 - 31 DEC 24:00

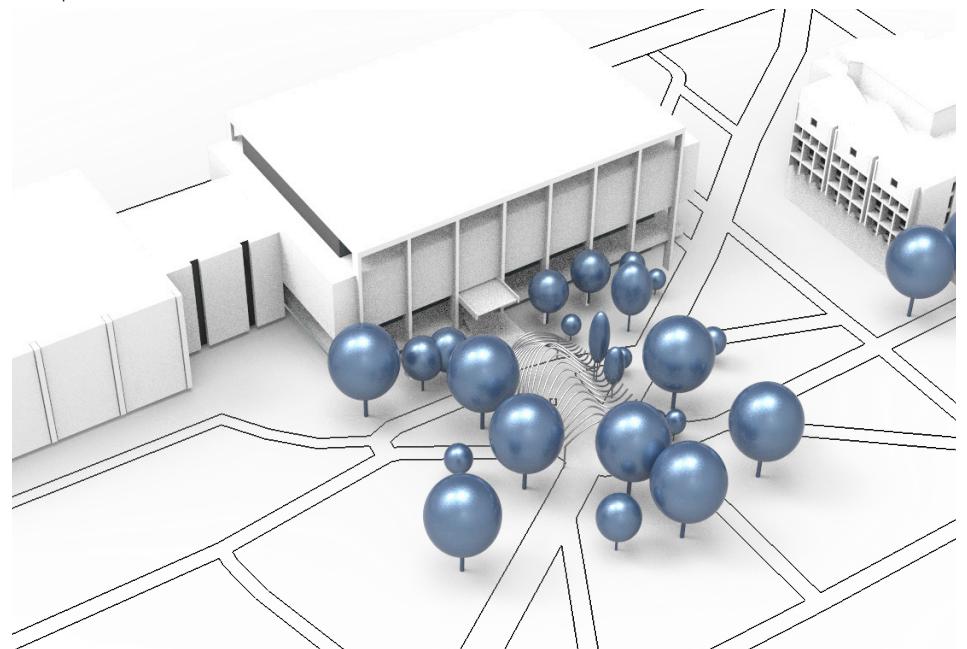
Comfortable: 40.08%; Short period comf.: 21.35%; Heat stress: 4.39%; Cold stress: 34.18%

Outdoor Comfort Simulation | Design Option 2

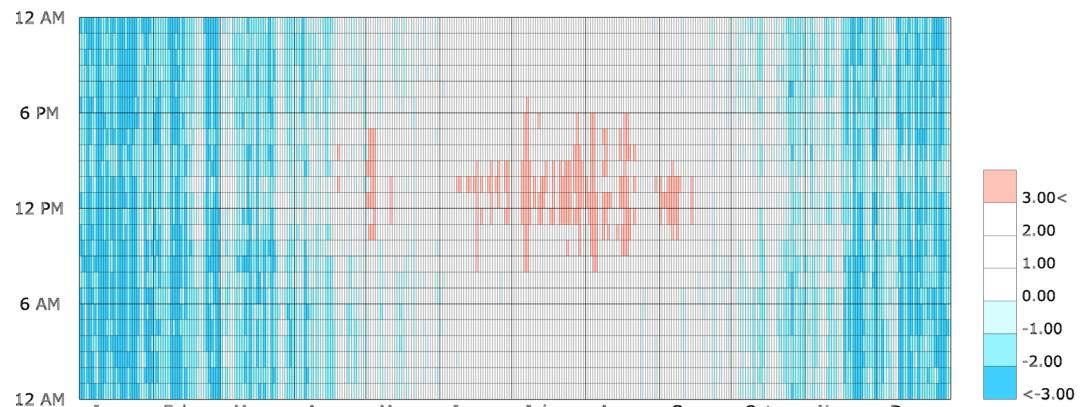
Plan



Perspective



Outdoor Comfort Graph



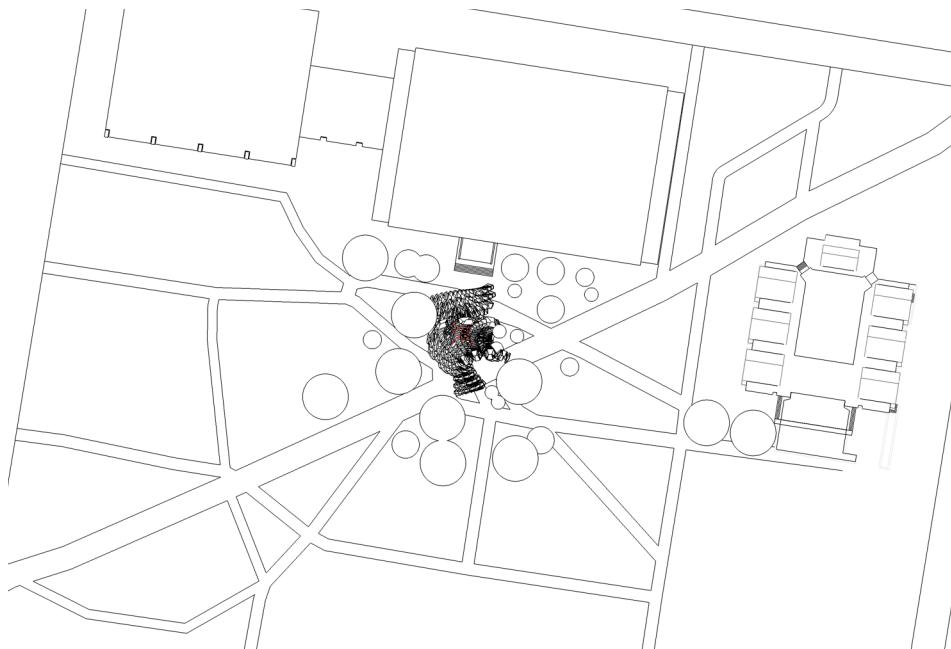
Outdoor Comfort (-3 = Extreme Cold | -2 = Cold | -1 = Cool | 0 = Comfort | 1 = Warm | 2 = Hot | 3 = Extreme Heat) - Hourly
Philadelphia International Ap_PA_USA

1 JAN 1:00 - 31 DEC 24:00

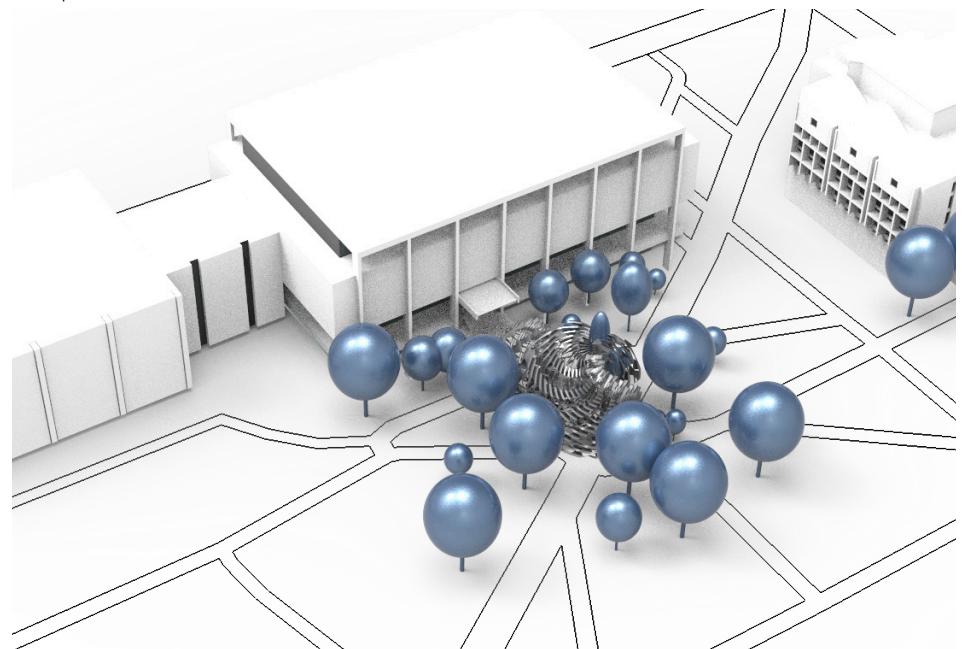
Comfortable: 39.27%; Short period comf.: 20.97%; Heat stress: 6.38%; Cold stress: 33.38%

Outdoor Comfort Simulation | Design Option 3

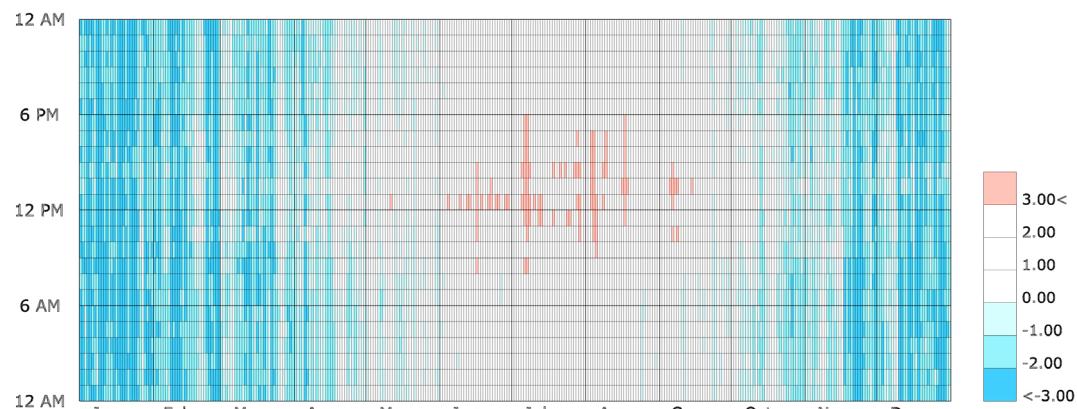
Plan



Perspective



Outdoor Comfort Graph



Outdoor Comfort (-3 = Extreme Cold | -2 = Cold | -1 = Cool | 0 = Comfort | 1 = Warm | 2 = Hot | 3 = Extreme Heat) - Hourly
Philadelphia International Ap_PA_USA

1 JAN 1:00 - 31 DEC 24:00

Comfortable: 40.98%; Short period comf.: 21.02%; Heat stress: 3.95%; Cold stress: 34.05%

Data Analysis

Data Analysis

It was virtually impossible to achieve a 100% comfort level for the year. In the simulation, the highest level of comfort I was able to achieve is 40.98%. I believe this is because the passive shading devices only mitigate solar radiation. This is an effective design strategy on warm, sunny days, but does nothing on cold days to combat the low temperature.