

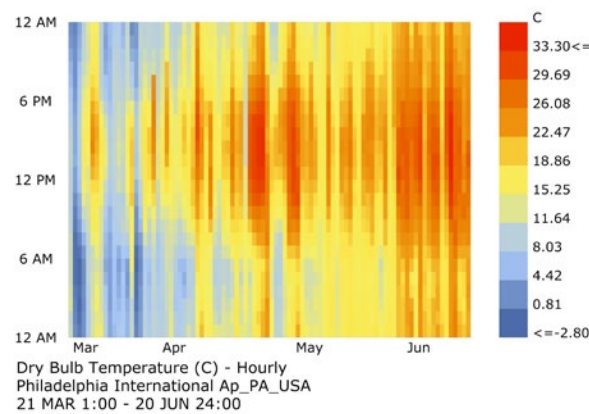
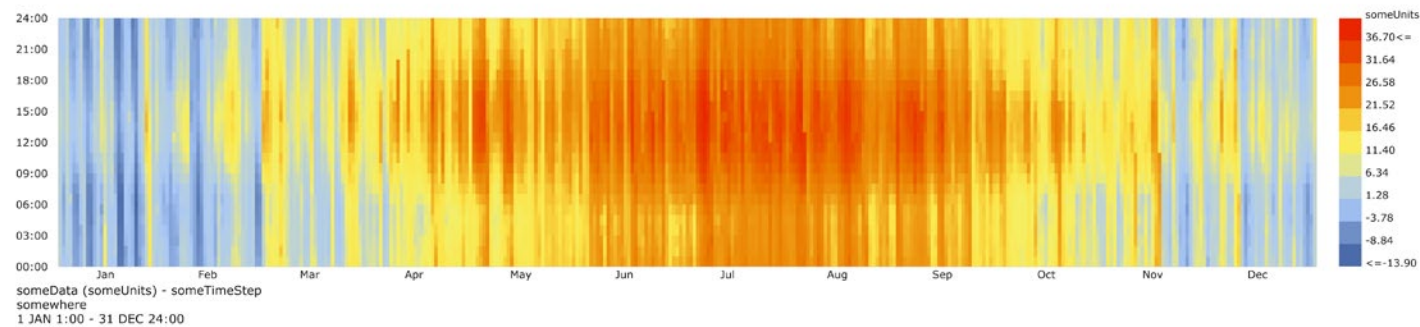
"DREAMROOM", PHILADELPHIA

XIAORANLIU

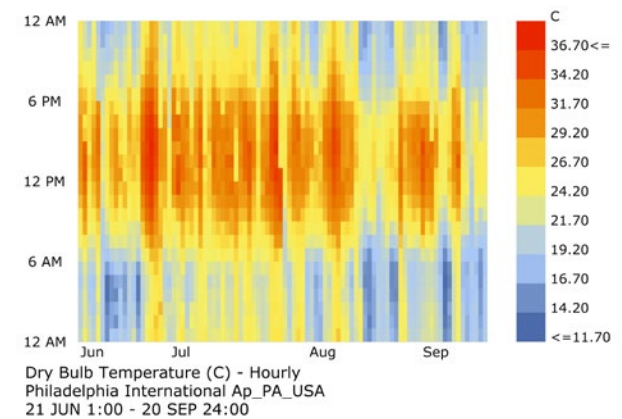
ARCH753-BUILDINGPERFORMANCE SIMULATION

By looking at TMY3 data, temperature in Philadelphia is mainly between 12 to 20 throughout the whole year, during which the average temperature is 12.7. The average temperature of each season is 16, 24, 9.5, 1.1.

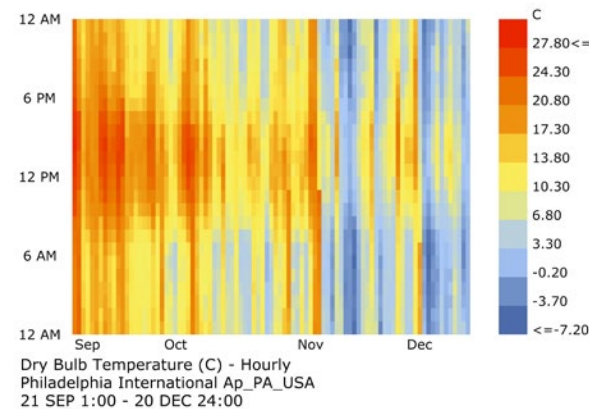
Concluded from data above, the climate of philly will be cooler and uncomfortable for people during the autumn and the winter. Also, I assume at this time people would like more stay at home than going outside.



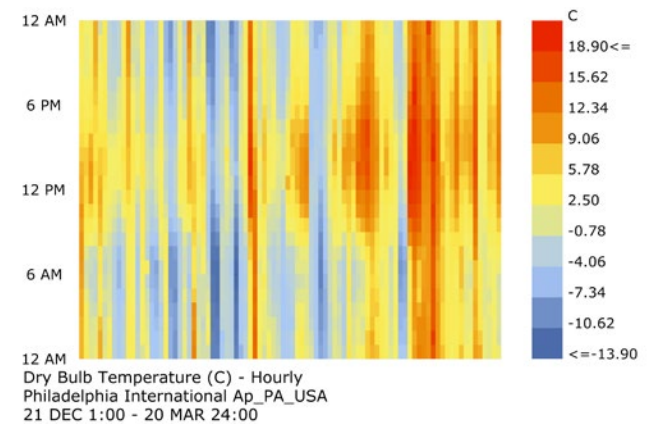
SPRING



SUMMER



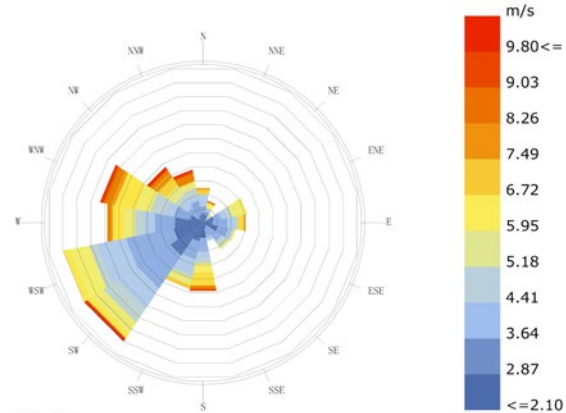
AUTUMN



WINTER

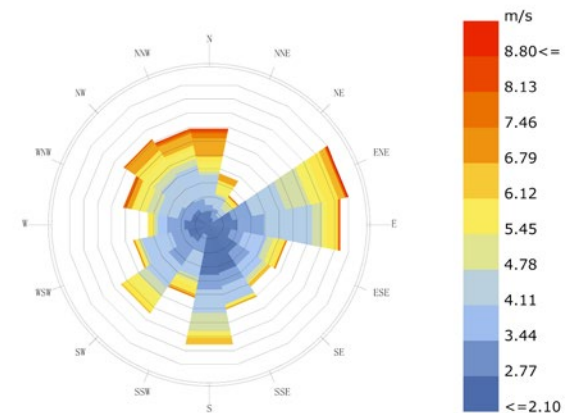
Take the standard of wind speed (2-10m/s) and Dry Bulb Temperature (18-24) as comfortable references, we know that each season is totally different. There are 527 hours satisfied for Spring, 848 hours for Summer, 179 hours for Autumn, and 5 hours for Winter.

These windrose graphics are supplements to the previous page.



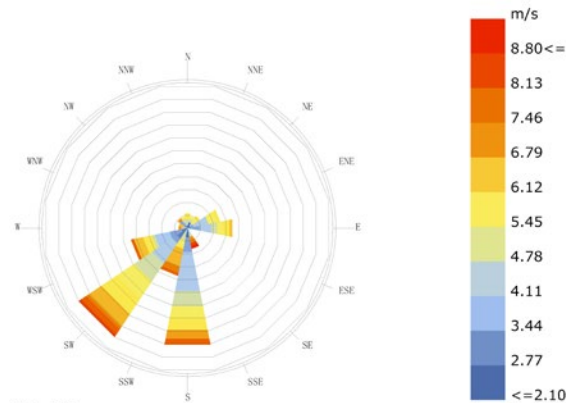
Wind-Rose
Philadelphia International Ap_PA_USA
21 MAR 1:00 - 20 JUN 24:00
Hourly Data: Wind Speed (m/s)
Calm for 0.00% of the time = 0 hours.
Each closed polyline shows frequency of 0.3%. = 7 hours.
...
Conditional Selection Applied:
2 < Wind Speed < 10
and 18 < Dry Bulb Temperature < 24
527.0 hours of total 8760.0 hours (6.02%).
527.0 hours of analysis period 2208.0 hours (23.87%).

SPRING



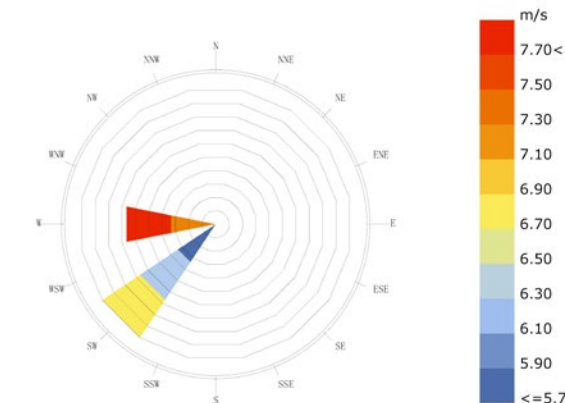
Wind-Rose
Philadelphia International Ap_PA_USA
21 JUN 1:00 - 20 SEP 24:00
Hourly Data: Wind Speed (m/s)
Calm for 0.00% of the time = 0 hours.
Each closed polyline shows frequency of 0.4%. = 8 hours.
...
Conditional Selection Applied:
2 < Wind Speed < 10
and 18 < Dry Bulb Temperature < 24
848.0 hours of total 8760.0 hours (9.68%).
848.0 hours of analysis period 2208.0 hours (38.41%).

SUMMER



Wind-Rose
Philadelphia International Ap_PA_USA
21 SEP 1:00 - 20 DEC 24:00
Hourly Data: Wind Speed (m/s)
Calm for 0.00% of the time = 0 hours.
Each closed polyline shows frequency of 0.2%. = 4 hours.
...
Conditional Selection Applied:
2 < Wind Speed < 10
and 18 < Dry Bulb Temperature < 24
179.0 hours of total 8760.0 hours (2.04%).
179.0 hours of analysis period 2184.0 hours (8.20%).

AUTUMN



Wind-Rose
Philadelphia International Ap_PA_USA
21 DEC 1:00 - 20 MAR 24:00
Hourly Data: Wind Speed (m/s)
Calm for 0.00% of the time = 0 hours.
Each closed polyline shows frequency of 0.0%. = 0 hours.
...
Conditional Selection Applied:
2 < Wind Speed < 10
and 18 < Dry Bulb Temperature < 24
5.0 hours of total 8760.0 hours (0.06%).
5.0 hours of analysis period 2160.0 hours (0.23%).

WINTER

According to the basic climate analysis of Philadelphia, the conditions for dream room would be really cold and lack of enough sunlight during the Autumn and Winter.

Additional issues

1. humid in the dream room

Passive Strategies

1. Add some plates to the window that towards outside to direct the air, to increase the windflow at home where should be less humid.
2. Modify the size of inner window to improve the condition of solar gain.

