

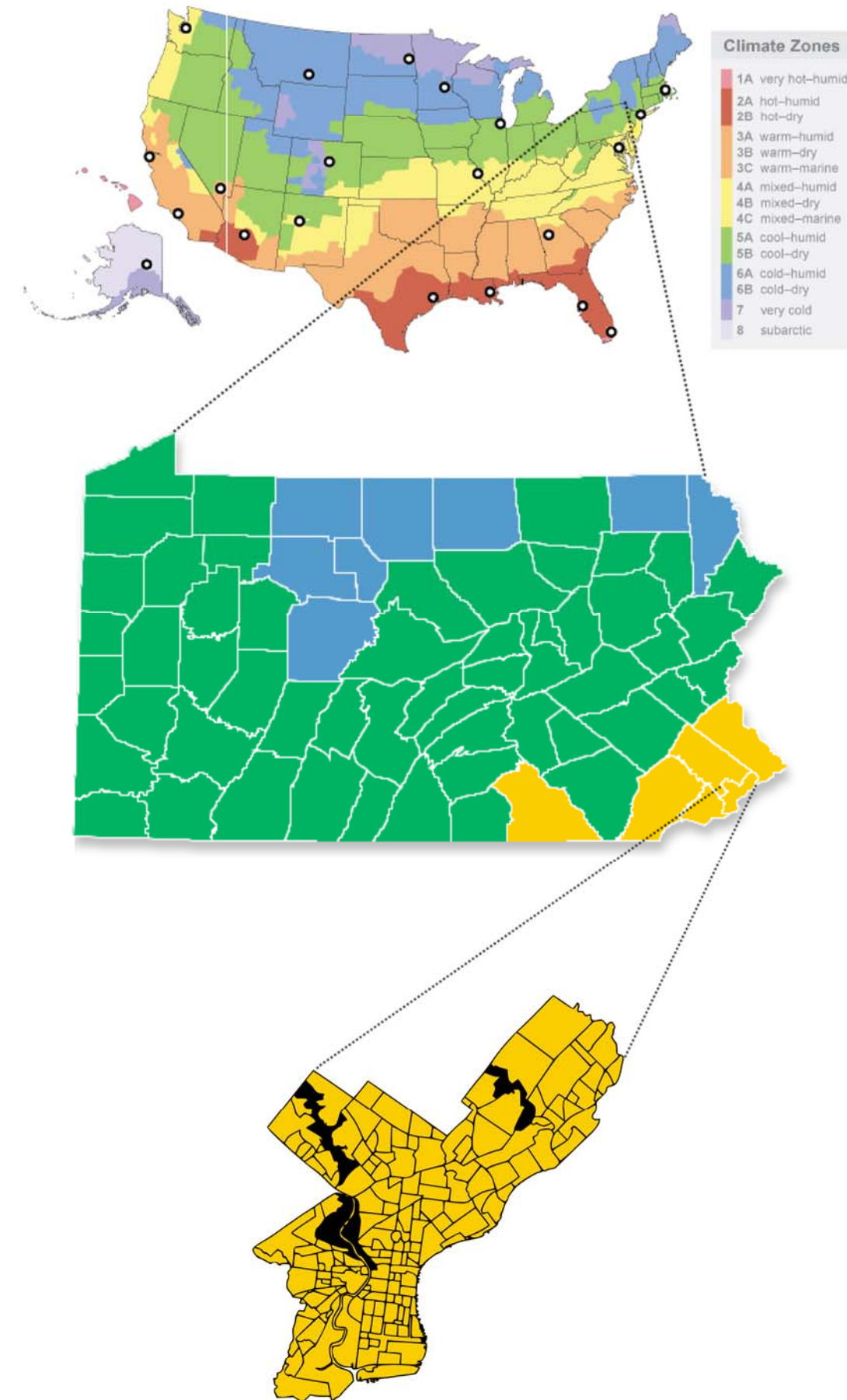
WEATHER DATA: Philadelphia International Ap,PA,USA,TMY3,
 LATITUDE: 39.87
 LONGITUDE: -75.23
 CDD: 1235
 HDD: 4759
 CLIMATE ZONE: 4A
 CHARACTERISTIC: MIXED-HUMID

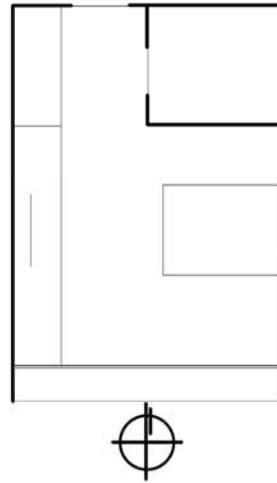
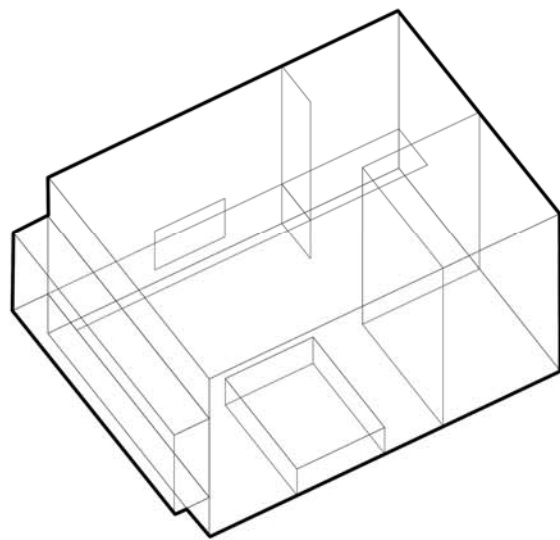
From the climate classification, The heat dregree days of philly is as much as four times than cool dregree days. The design strategy should focuss on the heating efficiency and thermal insulation.

Residential Prescriptive Requirements for Zone 1 (2009 IECC)

Ceiling R-value	38
Wood Frame Wall R-value	13
Mass Wall R-value ⁱ	5/10
Floor R-value	19
Basement Wall R-value ^c	10/13
Slab R-value ^d , Depth	10, 2 ft
Crawlspace Wall R-value ^c	10/13
Fenestration U-Factor ^b	0.35
Skylight U-Factor ^b	0.60
Glazed fenestration SHGC ^{b, e}	NR

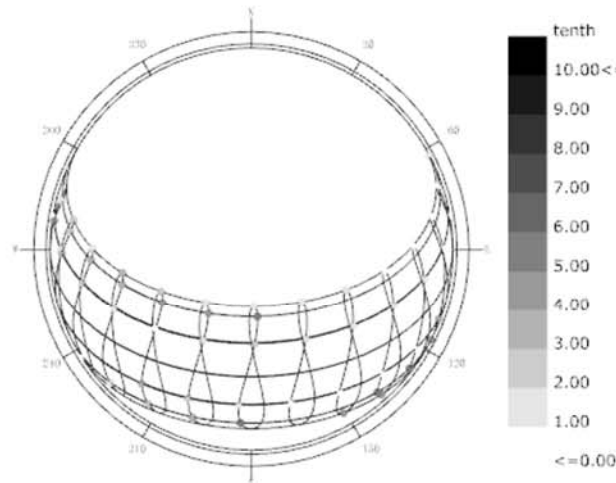
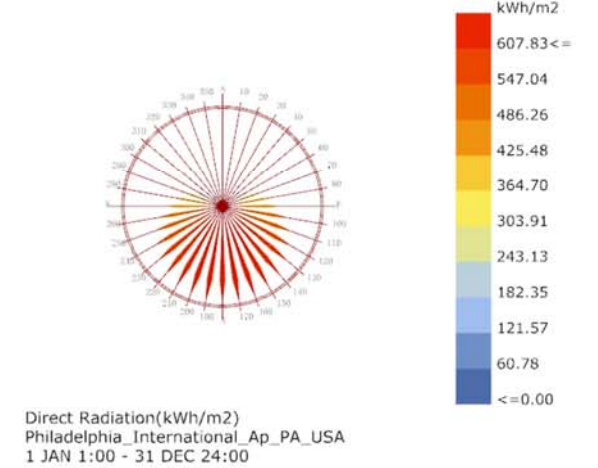
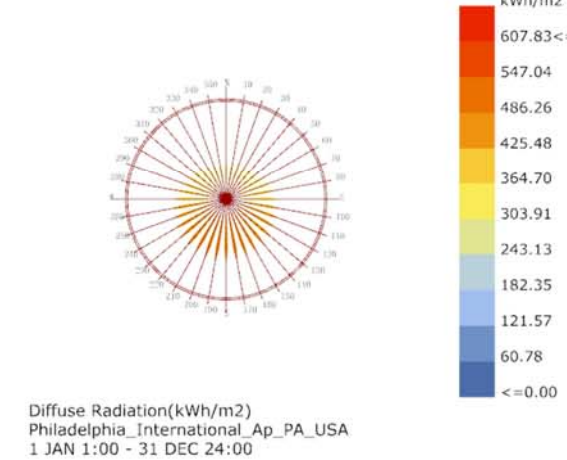
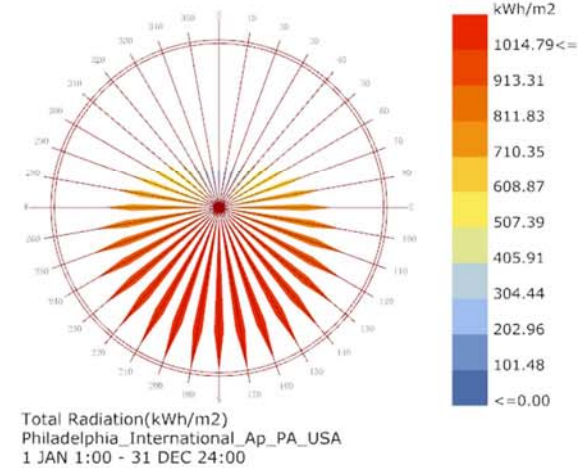
<https://energycode.pnl.gov/EnergyCodeReqs/?state=Pennsylvania>



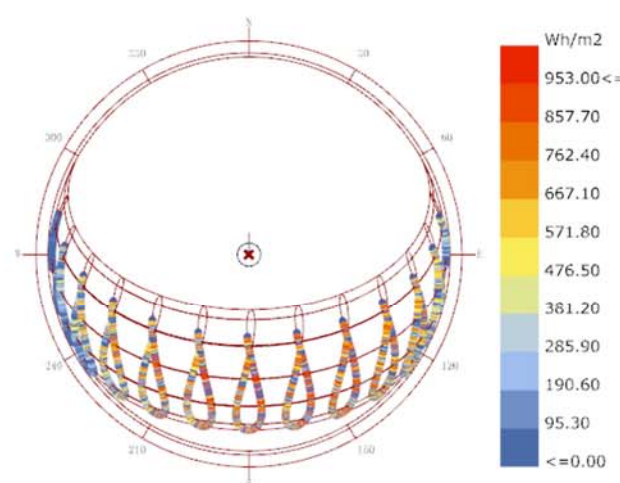


Area: 32 m2
Glazing area: 8.1 m2
Orientation Program: Midrise Apartment
Occupied Hour: 6 PM – 8AM

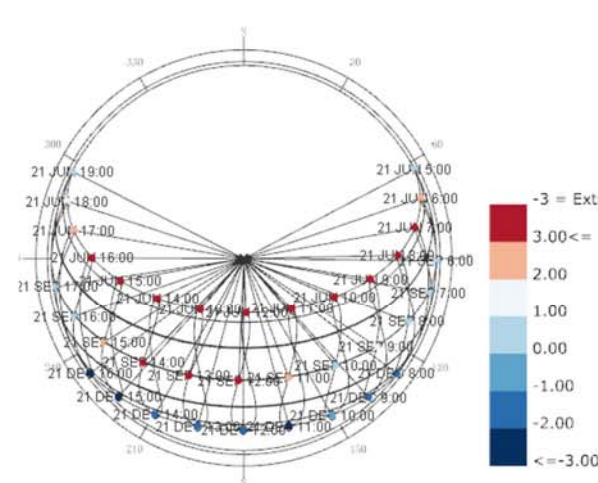
1. Use pv panels to store radiation during 9am-4am (unoccupied hour) , during this periods of time, the radiation rate is higher while the cloud cover is relative less.
2. From the diagram of sunpath, Shading is needed in July and august from 7 a.m. to 4 p.m. in September from 12 to 2 PM.



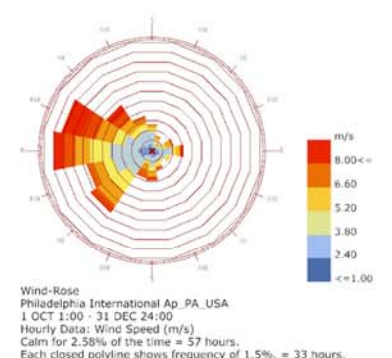
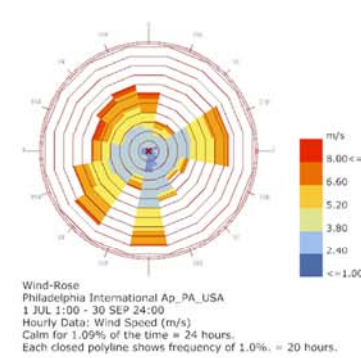
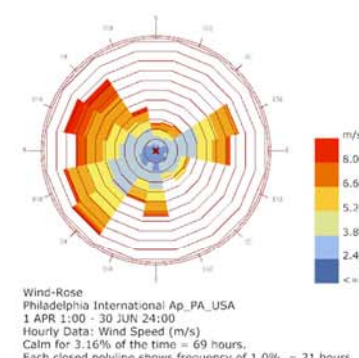
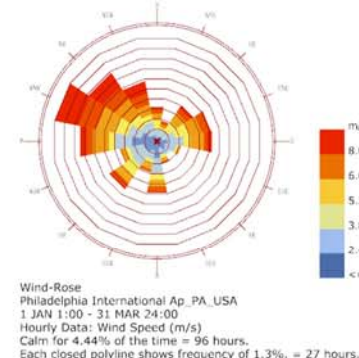
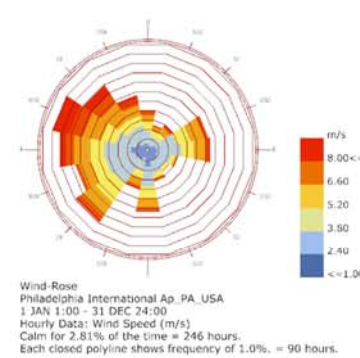
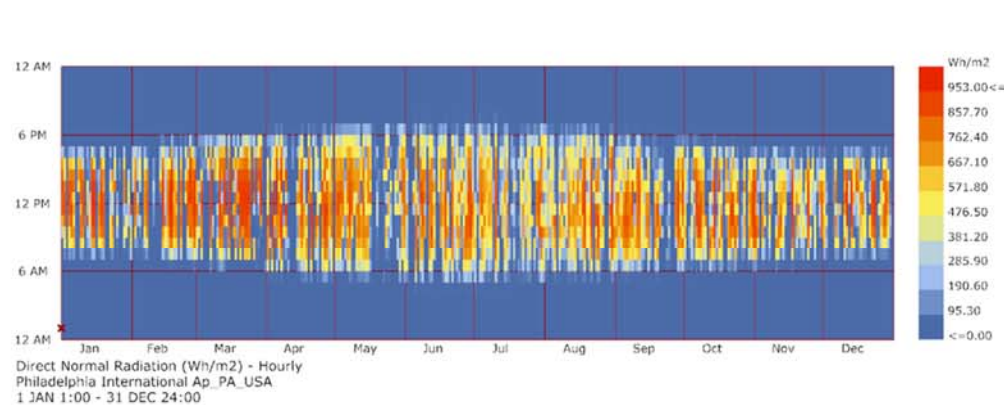
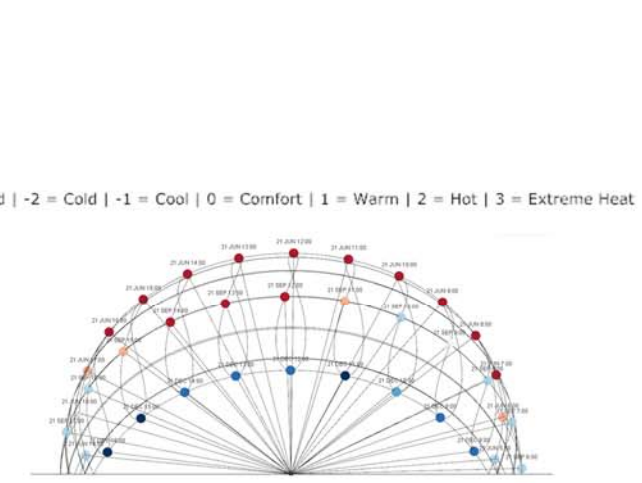
Sun-Path Diagram - Latitude: 39.87
Hourly Data: Total Cloud Cover (tenth)
Philadelphia International Ap_PA_USA
...
Conditional Selection Applied:
Total Cloud Cover < 6
54.0 hours of total 146.0 sun up hours(36.99%).

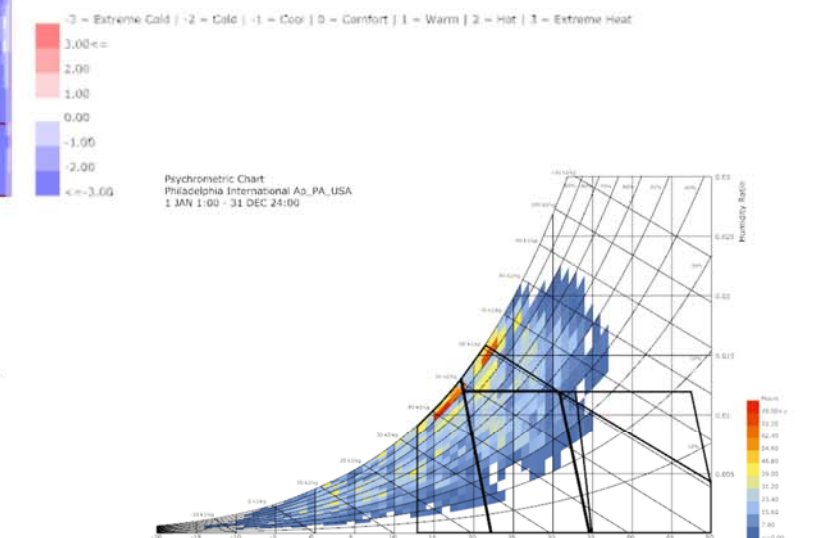
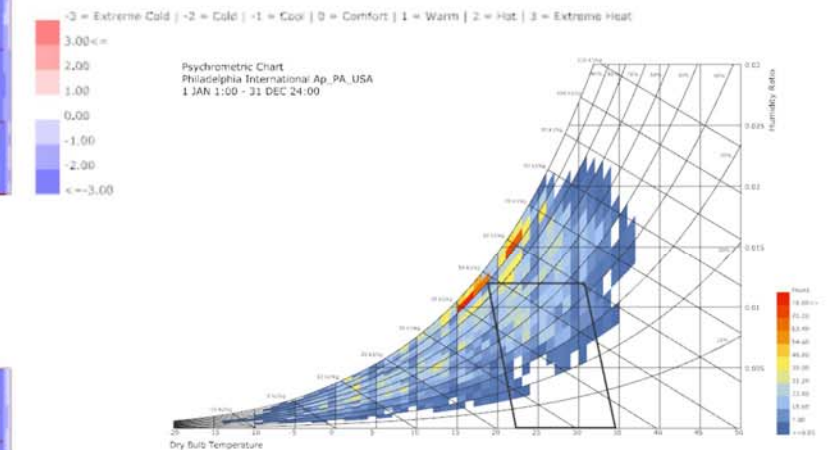
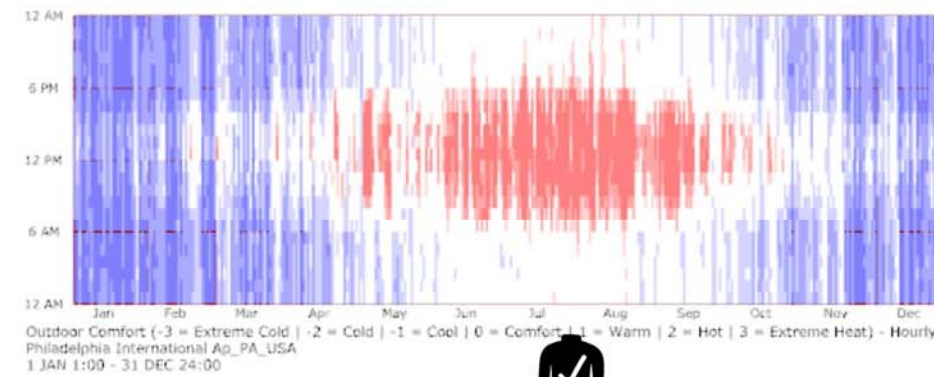
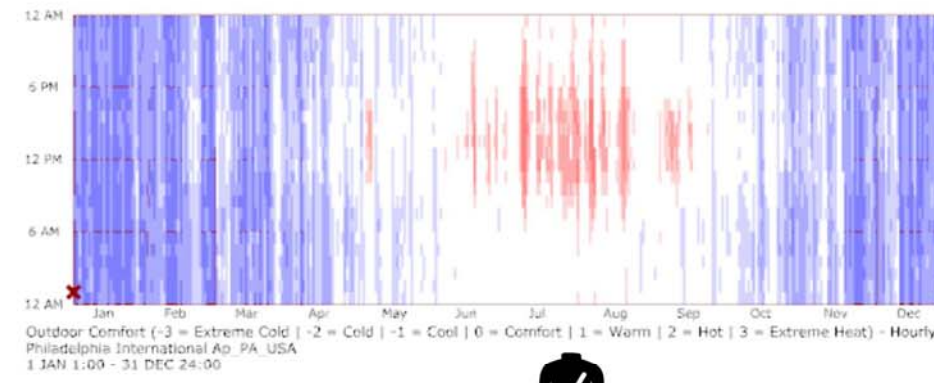
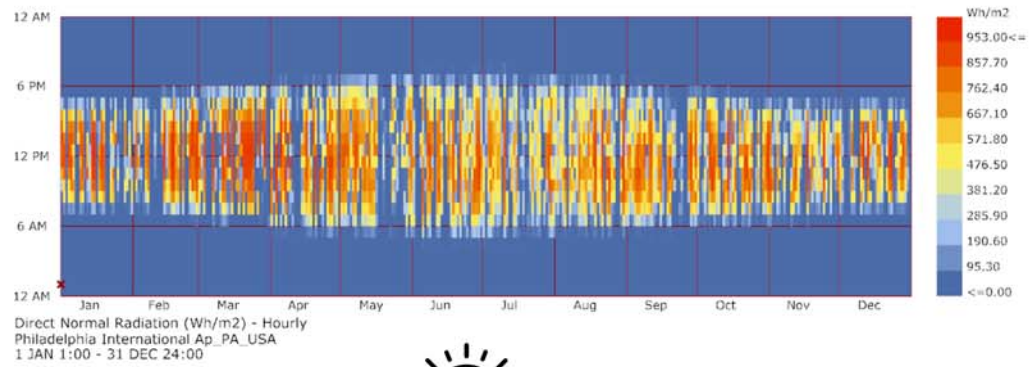
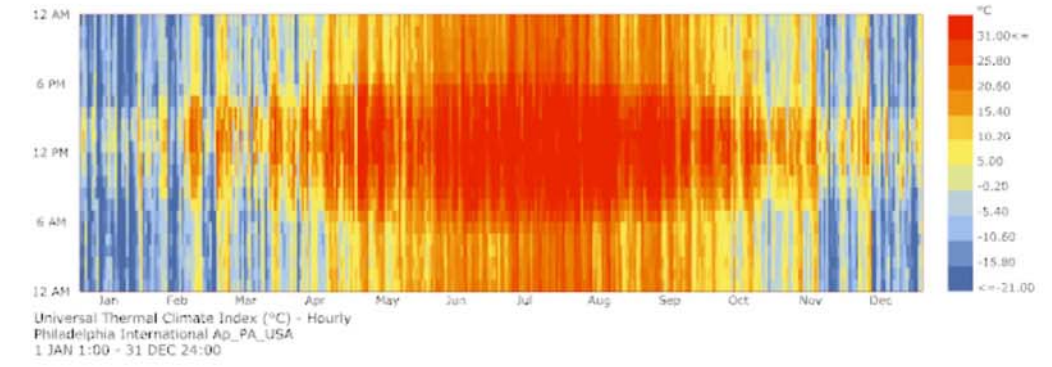
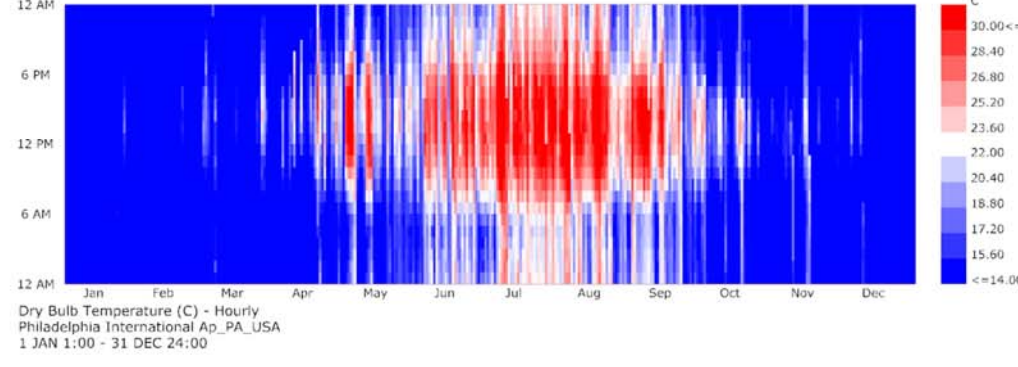
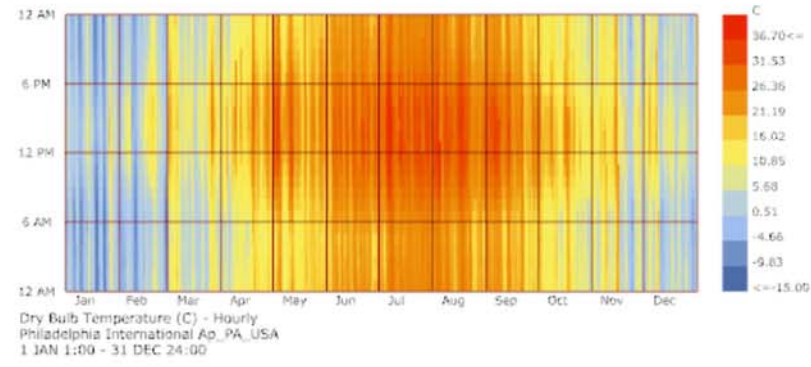
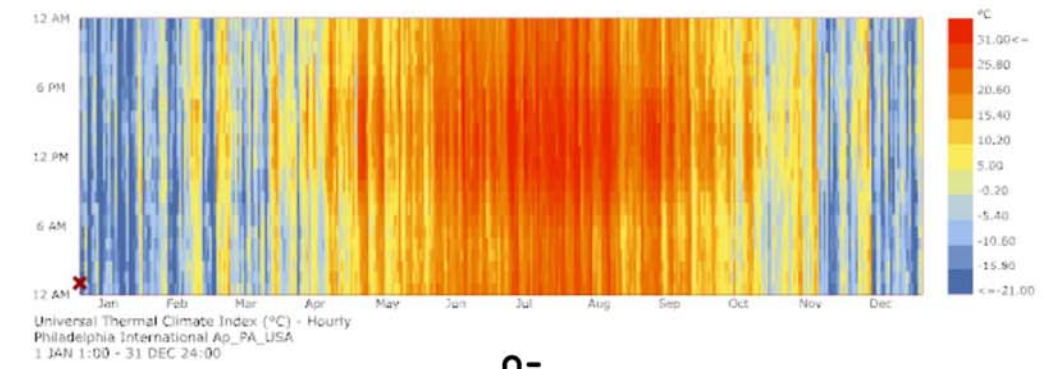
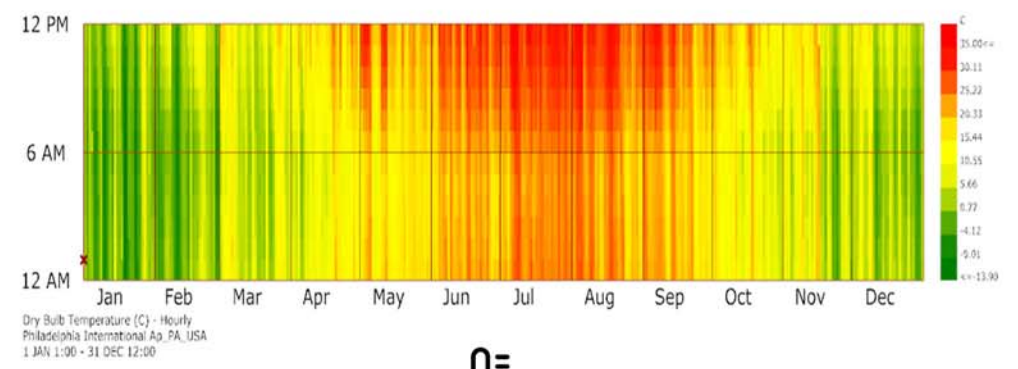
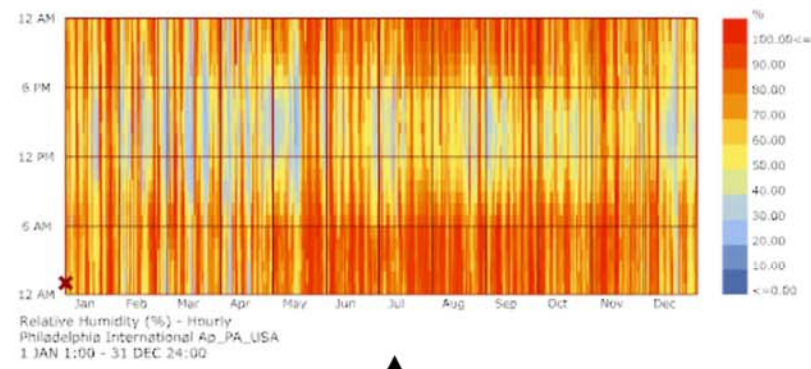


Sun-Path Diagram - Latitude: 39.87
Hourly Data: Direct Normal Radiation (Wh/m2)
Philadelphia International Ap_PA_USA



Sun-Path Diagram - Latitude: 39.87
Hourly Data: Outdoor Comfort (-3 = Extreme Cold | -2 = Cold | -1 = Cool | 0 = Comfort | 1 = Warm | 2 = Hot | 3 = Extreme Heat)
Philadelphia International Ap_PA_USA





3 According to the out door comfort table, in the case of exposure to solar radiation the comfort time ratio in Philadelphia is 37%. In May and June in April, the use of shading can increase the comfort level. In July and August, passive and active cooling means can be used to reduce the temperature to 26 degrees Celsius, according to the relative humidity diagram; this temperature has been able to achieve a comfortable range. Deciduous trees are good shading method.