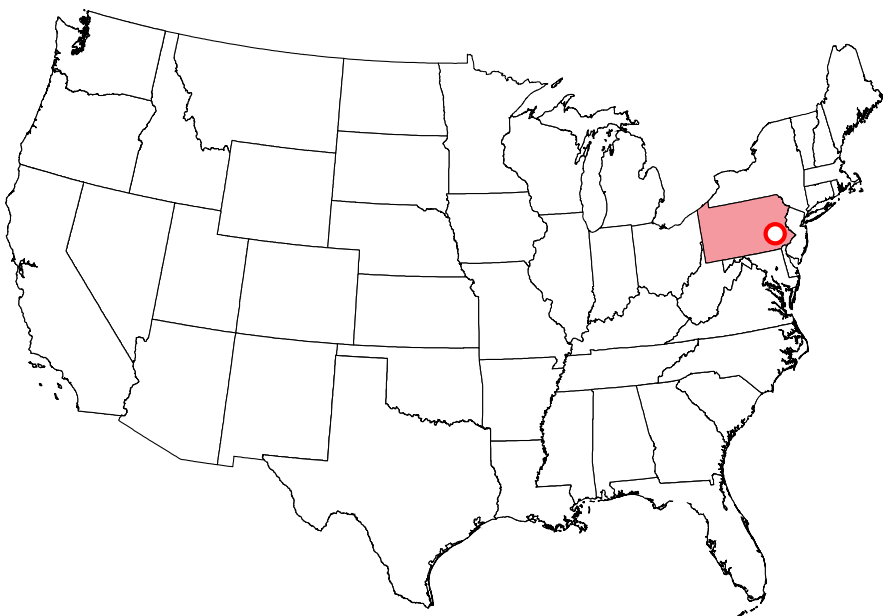
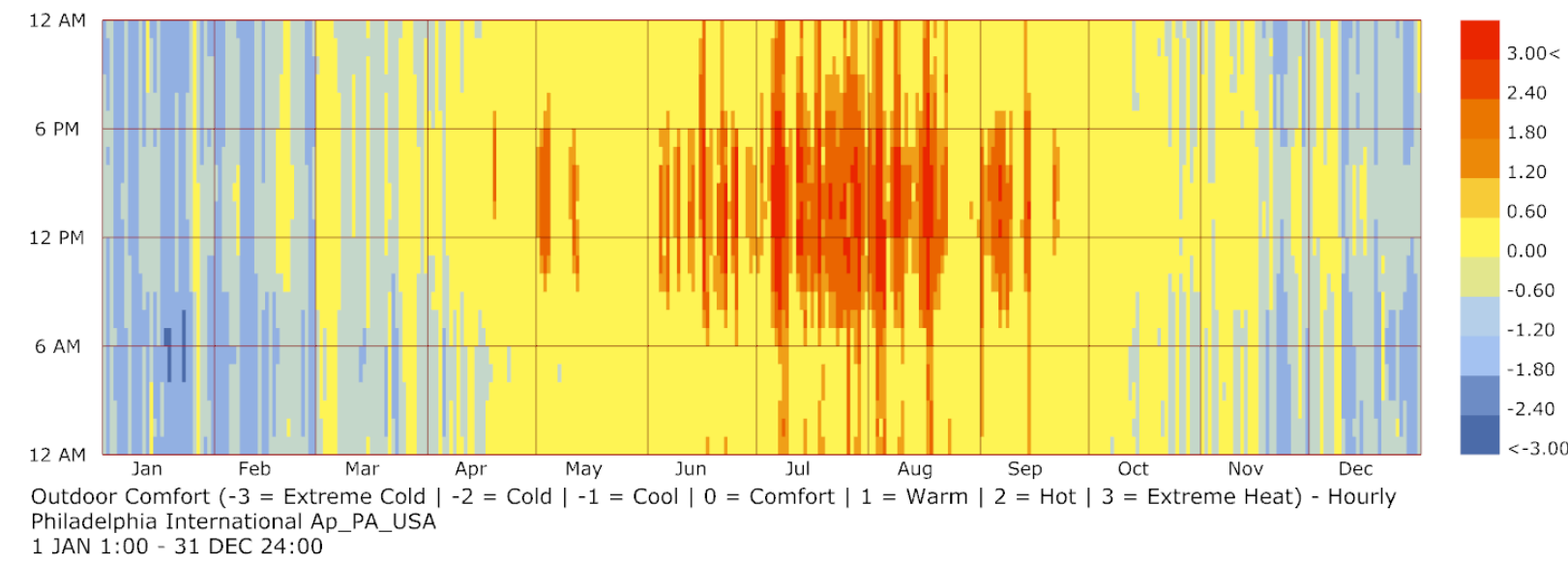


PHILADELPHIA, PA

LOCATION

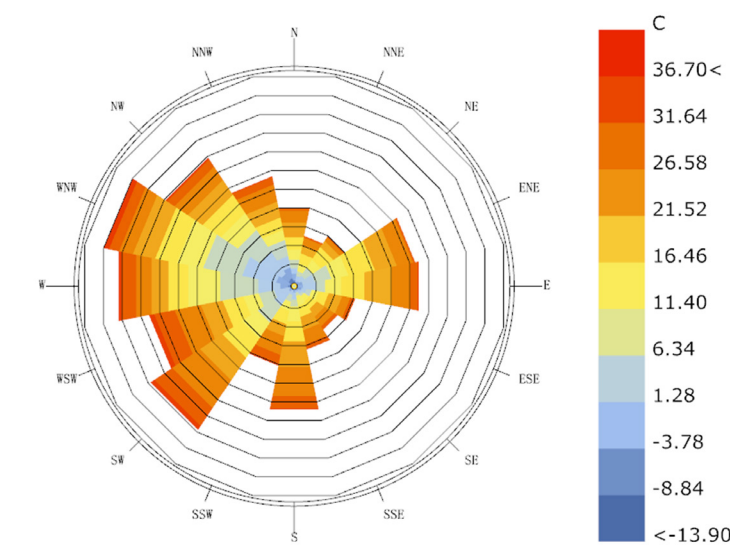


COMFORTABLE TEMPERATURE ANALYSIS

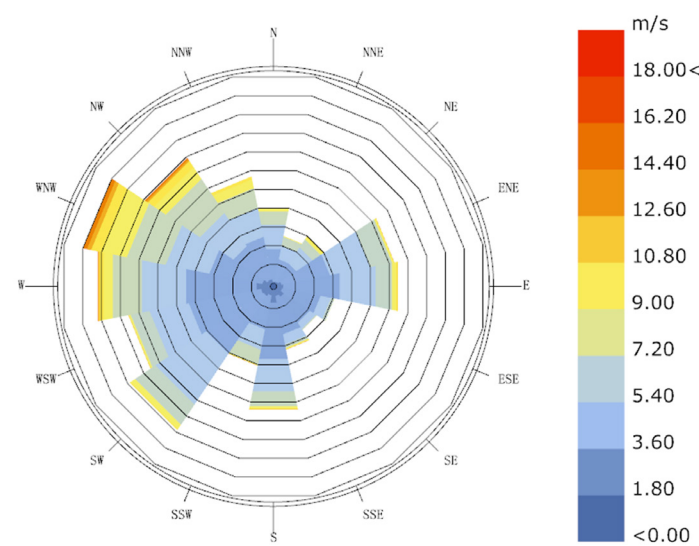


Philadelphia falls under the northern periphery of the humid subtropical climate zone, whereas according to the Trewartha climate classification, the city has a temperate maritime climate. Summers are typically hot and muggy, fall and spring are generally mild, and winter is cold. Snowfall is highly variable, as some winters consist of light snow while others consist of major snowstorms, with normal seasonal snowfall standing at 22.4 in (57 cm); snow in November or April is rare and a sustained snow cover is also rare.

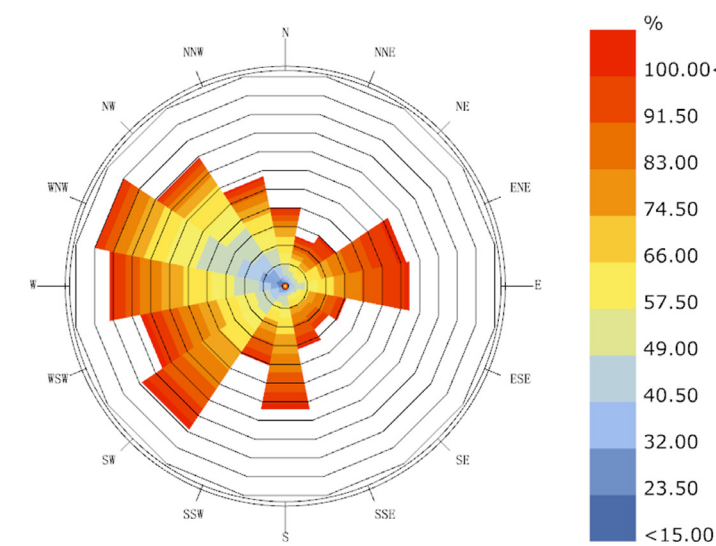
WIND ROSE ANALYSIS



Wind-Rose
Philadelphia International Ap_PA_USA
1 JAN 1:00 - 31 DEC 24:00
Hourly Data: Dry Bulb Temperature (C)
Calm for 2.81% of the time = 246 hours.
Each closed polyline shows frequency of 1.0%. = 90 hours.

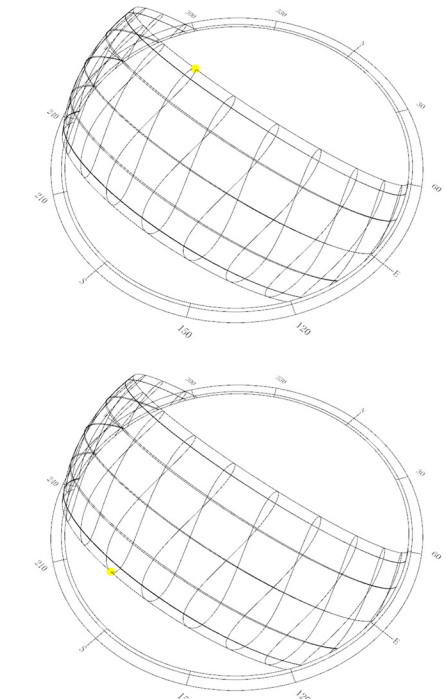


Wind-Rose
Philadelphia International Ap_PA_USA
1 JAN 1:00 - 31 DEC 24:00
Hourly Data: Wind Speed (m/s)
Calm for 2.81% of the time = 246 hours.
Each closed polyline shows frequency of 1.0%. = 90 hours.



Wind-Rose
Philadelphia International Ap_PA_USA
1 JAN 1:00 - 31 DEC 24:00
Hourly Data: Relative Humidity (%)
Calm for 2.81% of the time = 246 hours.
Each closed polyline shows frequency of 1.0%. = 90 hours.

SUN PATH ANALYSIS

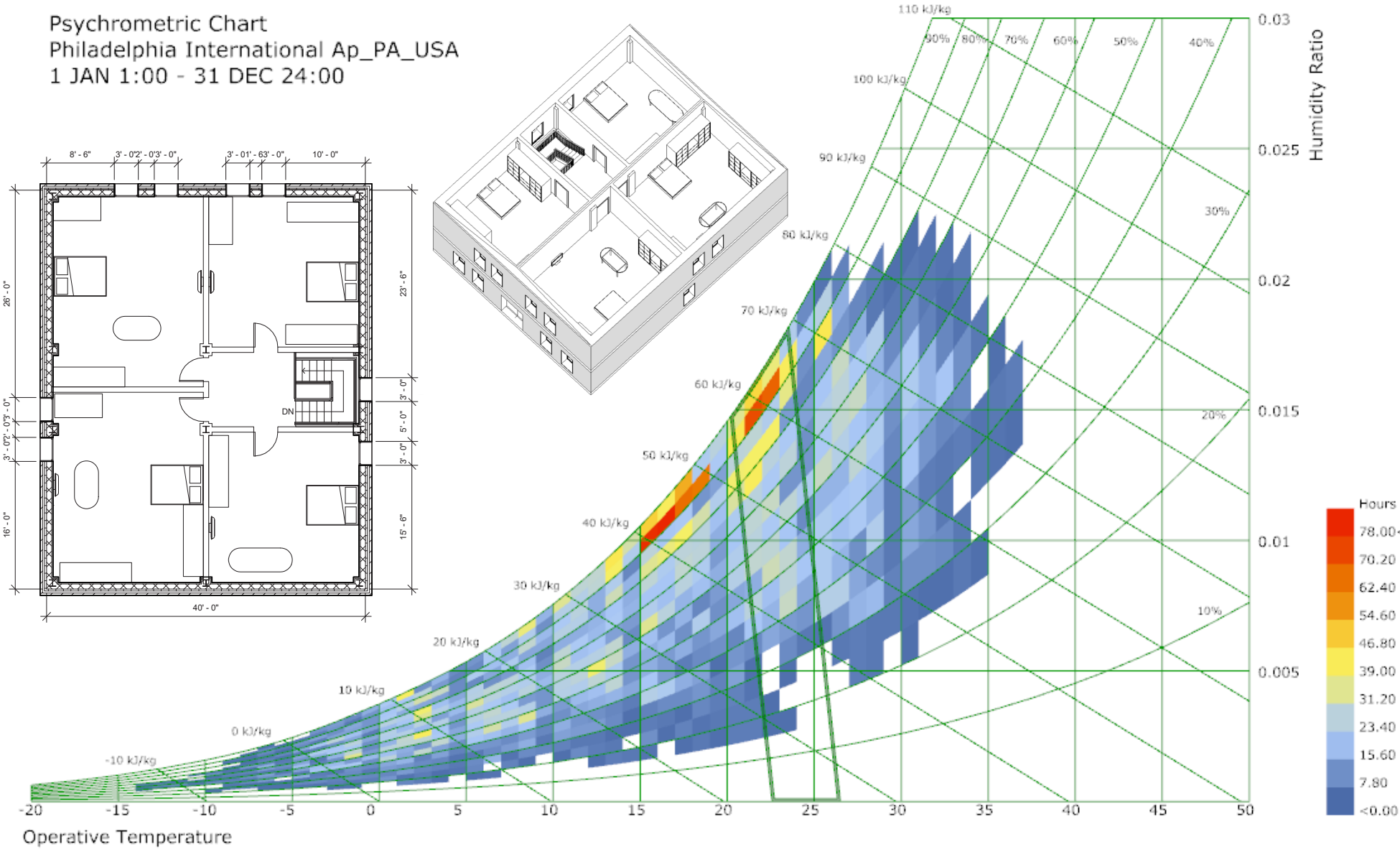


STRATEGY

Philadelphia has extreme cold winter, and we can see from the psychrometric chart that a lot of time in one year the temperature is kind of cold compared to the comfort zone. So I think we should try to keep more heat for the house.

- 1. add large window on the south wall. From the radiation analysis, we can see that the sunlight mainly come from the south. So if we have large windows on the south wall, we could gather more heat from sunlight.
- 2. Use double-layered glass (such as Low-E glass) to improve heat insulation for the room.
- 3. Add thermal barrier in the wall or paint exterior elevation by dark color to keep heat.

PSYCHROMETRIC CHART



RADIATION ANALYSIS

