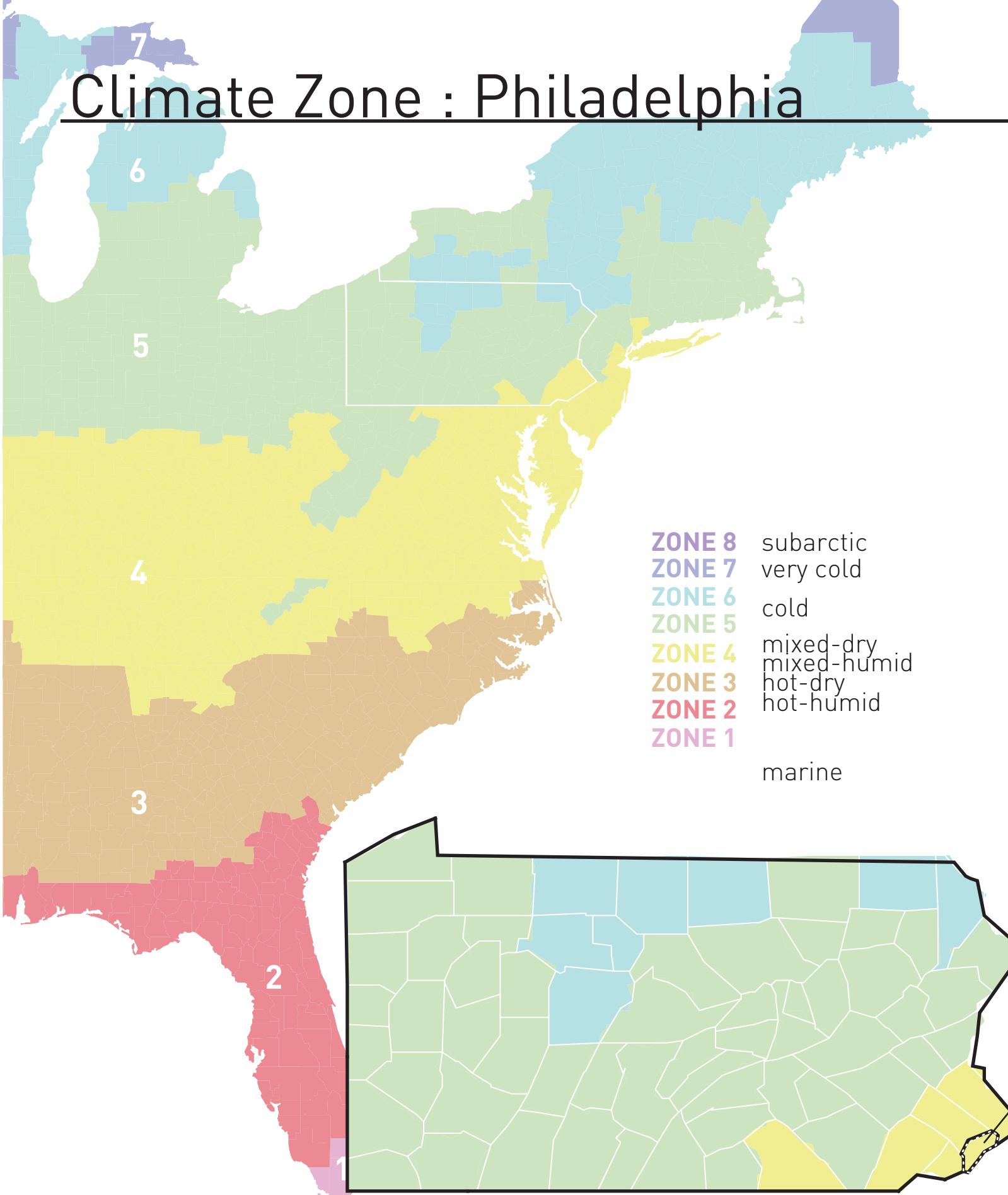


Climate Zone : Philadelphia



LOCATION: Philadelphia, Pennsylvania, USA

LATITUDE: 39.87

LONGITUDE: 75.23

WEATHER DATA: USA_PA_Philadelphia.Intl.AP.724080_TMY3

CDD: 266 degree days

HDD: 2754 degree days

Cooling Degree Days (CDD) and Heating Degree Days (HDD) were calculated October 2016 through Ladybug for Grasshopper.

CLIMATE ZONE: 4

CHARACTERISTIC: mixed-humid

Philadelphia is characterized to have a mixed-humid climate, which is described as receiving "more than 20 inches of annual precipitation, has approximately 5,400 heating degree days (65°F) or fewer, and where the average monthly outdoor temperature drops below 45°F during the winter months."

Residential Prescriptive Requirements for Climate Zone 4 (except marine)

as per 2009 International Energy Conservation Code (IECC) on
<https://energycode.pnl.gov/EnergyCodeReqs/?state=Pennsylvania>

Ceiling R-value	38
Wood Frame Wall R-value	13
Mass Wall R-value	5/10
Floor R-value	19
Basement Wall R-value	10/13
Slab R-value, Depth	10, 2 ft
Crawlspac Wall R-value	10/13
Fenestration U-Factor	0.35
Skylight U-Factor	0.60
Glazed fenestration SHGC	NR

Atmospheric Conditions

WINTER

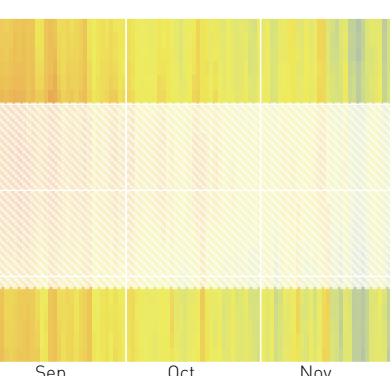
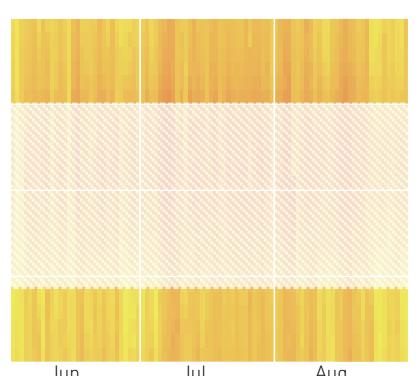
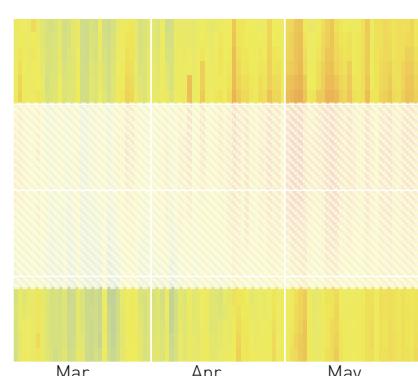
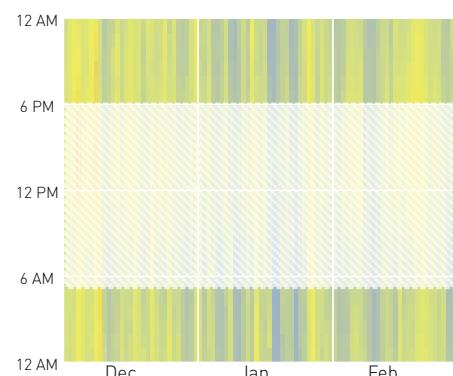
SPRING

SUMMER

FALL

EXTERIOR FACTORS

DRY BULB TEMPERATURE



Colleges and universities in Philadelphia explain to incoming students from across the globe on their New Student orientation programs, guides and websites the four different seasons that occur in the city to help them prepare for the weather when they move in. On Temple University's Future Students website (www.temple.edu/provost/international/gp/future-students/philadelphia-weather.html), seasons are described as such:

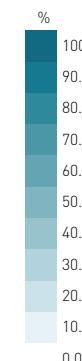
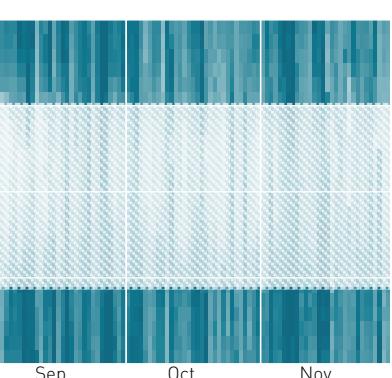
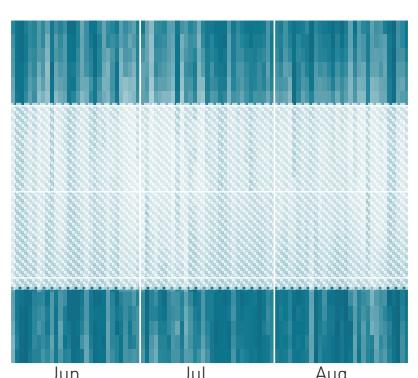
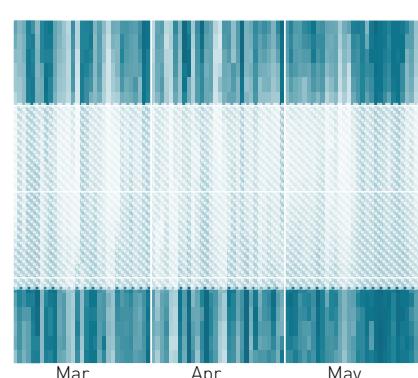
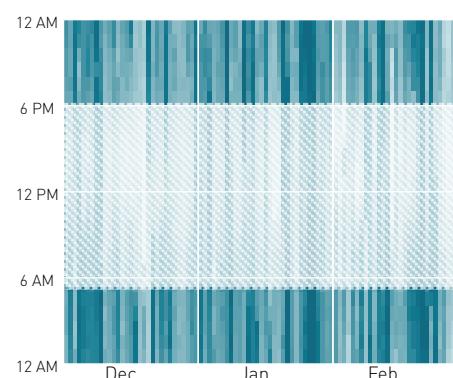
The spring season (March-May) is sunny with several rain showers. The temperature usually ranges from 34-73 F (1-23 C).

The summer season (June-August) is sunny and warm. The temperature usually ranges from 63-87 F (17-31 C).

The fall season (also known as the autumn season) falls between September and November with a temperature that usually ranges from 39-77 F (4-25 C).

The winter season is cold and snowy. The temperature usually ranges from 24-44 F (-4-7 C).

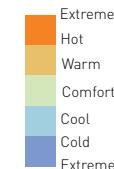
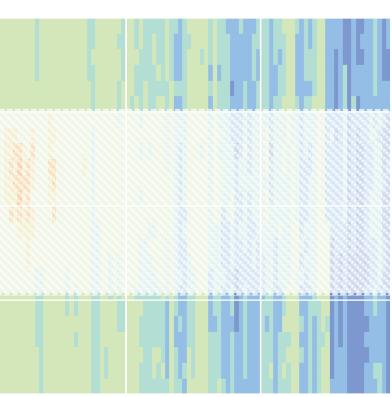
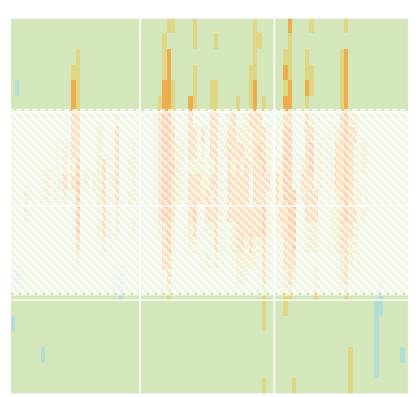
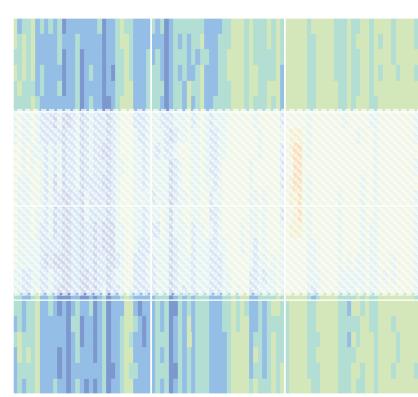
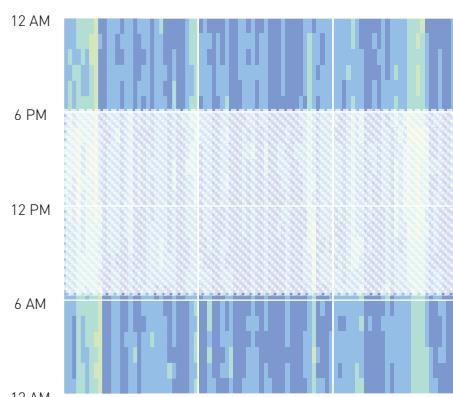
RELATIVE HUMIDITY



While the city of brotherly love is said to have extended spring and fall seasons and shortened winter and summer seasons, it isn't uncommon to experience the conditions of all four seasons in the duration of a week in any season.

The figures on this page plot out annual Philadelphia weather to demonstrate temperature and humidity patterns typical of the seasons. The bottom chart maps out temperature in the context of comfort, based on UTCI. On all of the charts the time period between roughly 6 AM and 6 PM is faded in order to flesh out the typical occupation hours at a residence.

OUTDOOR COMFORT



Elemental Conditions

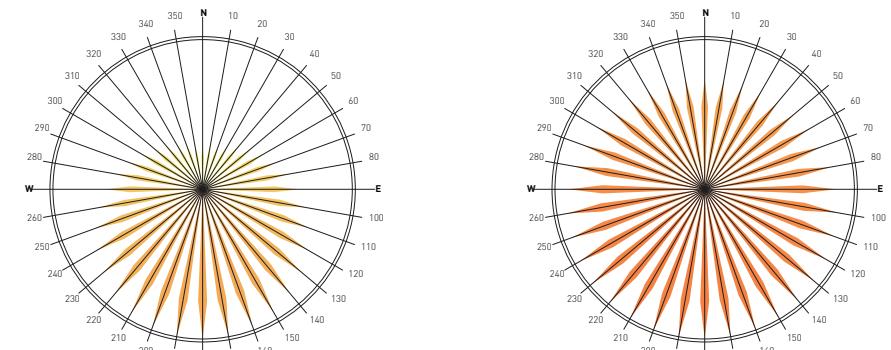
WINTER

SPRING

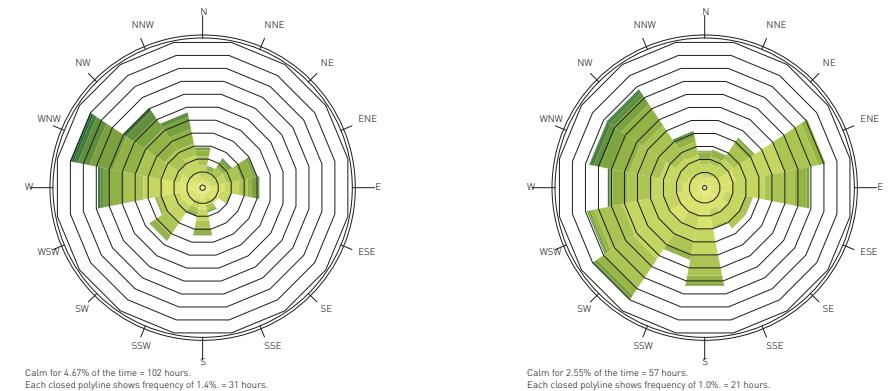
SUMMER

FALL

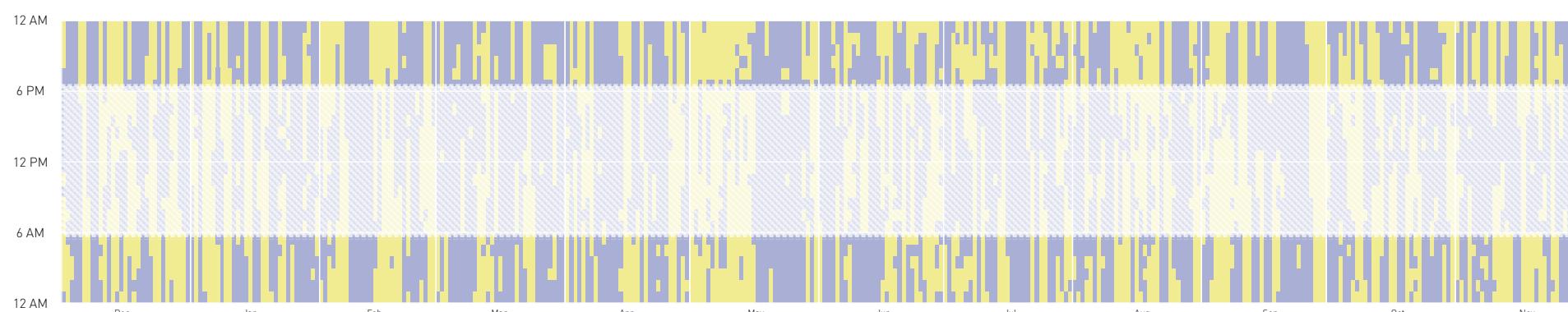
TOTAL RADIATION



HOURLY DATA: WIND SPEED



TOTAL CLOUD COVER (TENTH) - HOURLY



OTHER CONTRIBUTING FACTORS

Besides temperature, other factors pertaining to climate play a large role in the overall comfort of an individual be they inside or outside. The charts on this page show elemental factors that could have major effects on the design of comfort of a residential space: radiation, wind, and sky coverage.

Just like the previous page, the charts are more or less separated by season to demonstrate the typical patterns of these months. The variance of the graphs per season indicates the importance of considering things like orientation and context in the design process.

RADIATION

It ought to be considered that half a year, 6 months at a time, radiation chiefly comes from the Soutern direction. This becomes a quite important factor when considering the location of egress and windows, in terms of heat and light.

WIND SPEEDS

Philadelphia does receive a substantial amount of wind at various speeds across all seasons. This factor should be taken into consideration along with temperature and radiation since the combination of these elements would make a bigger impact on the comfort design.

SKY/CLOUD COVER

The ratio of how much the sky is covered by clouds over the course of the year is boiled down and reduced to two basic values/situations: 0 and 1, cloudy and sunny, respectively.