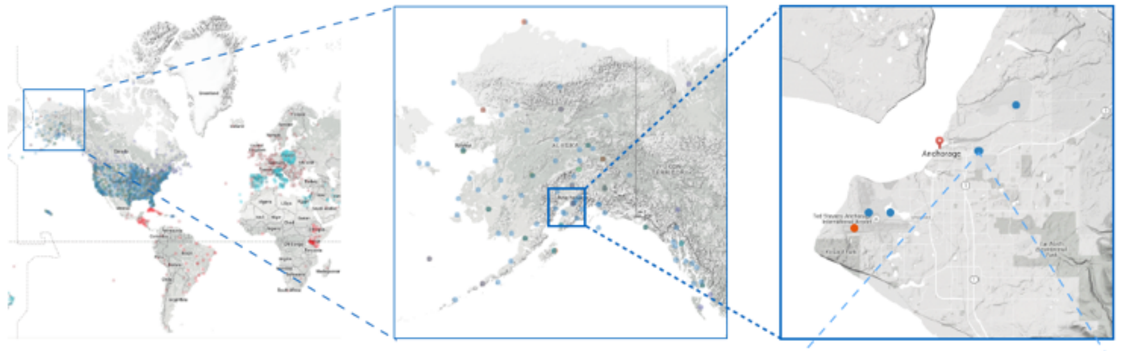
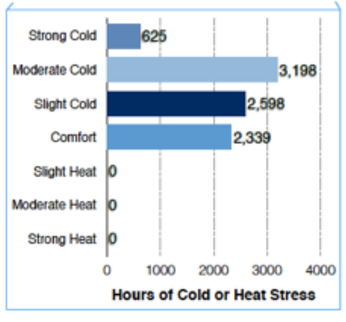
ARCH753 Building Performance Simulation / Final Project

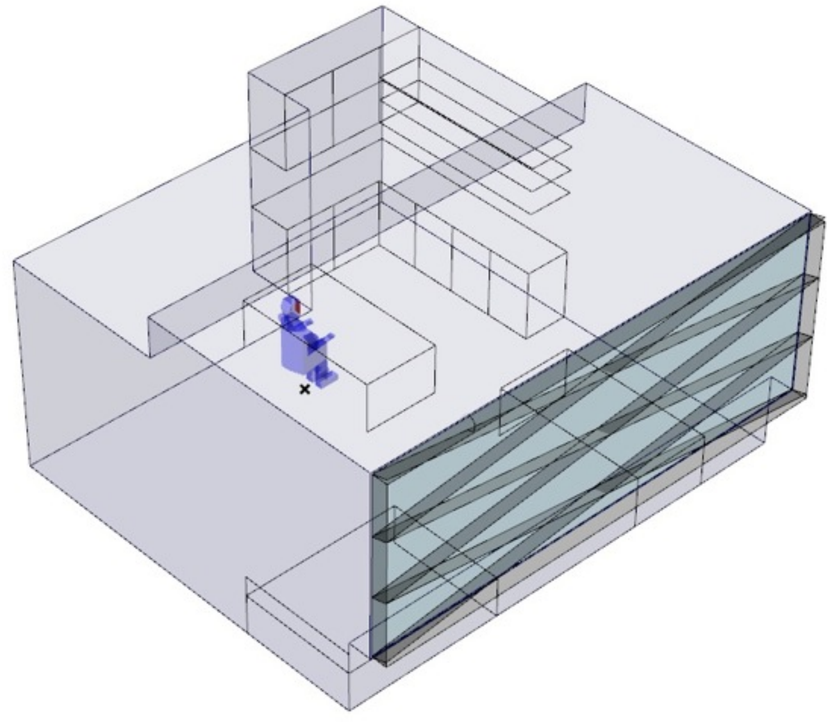
JEEEUN LEE

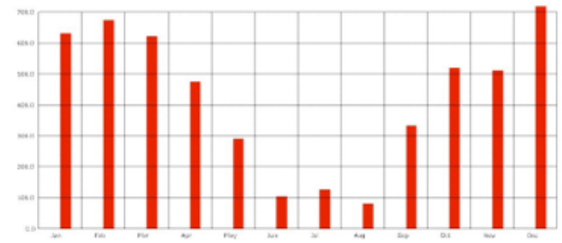




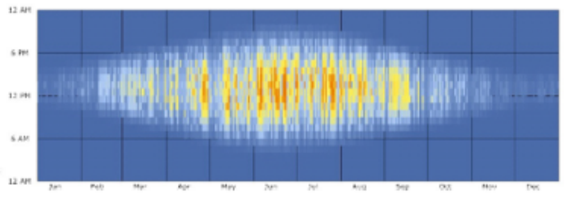
WEATHER DATA (EPW FILE)

Station Name: Anchorage-Merrill
Data Source: TMY3
Latitude: 61.22°N
Longitude: -149.85°
EPW URL: http://apps1.eere.energy.gov/buildings/energyplus/weatherdata/4_north_and_central_america_wmo_region_4/1_usa/USA_AK_Anchorage-Merrill.Field.702735_TMY3.zip

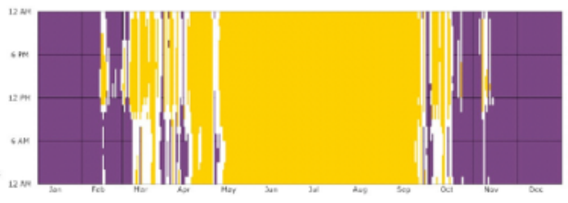




Cold Temperature; only heating degree days exist



Lack OF Solar Radiation



Too much heat in summer indoor

D1 Orientation

To optimize the orientation, energy simulation will be helpful to figure out wichi orientation requires less loads.

The orientation of the lowest values can reflect that there will be less hours of uncomfortable without HVAC.

D2 Natural Ventilation

Without HVAC, natural ventilation is an effective way to emit the collected heat during the summer time.

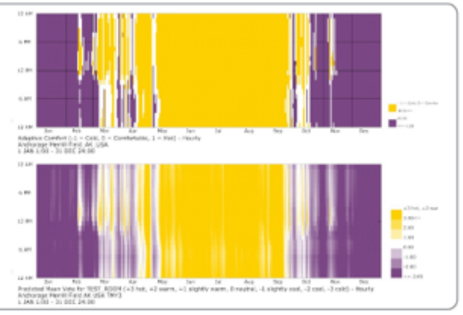
D3 Shading

To reduce radiation in summer and maximize radiation in winter, horizontal shadings with certain angle will be helpful.

Adaptive Comfort:
11.74%
1028 hours / year

% of Hot: 49.39%
% of Cold: 38.87%

PMV Comfort:
7.26%
636 hours / year

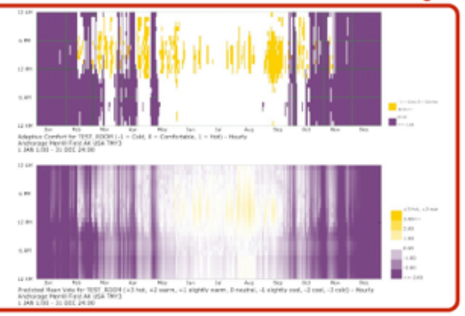


Final Design

Adaptive Comfort:
47.25%
4139 hours / year

% of Hot: 6.90%
% of Cold: 45.84%

PMV Comfort:
33.07%
2897 hours / year



Adaptive	PMV	Design Proposals
11.58	6.99	D1 Orientation
46.74	34.24	D2 Natural Ventilation
47.25	33.07	D3 Shading