

INDOOR ENVIRONMENT QUALITY



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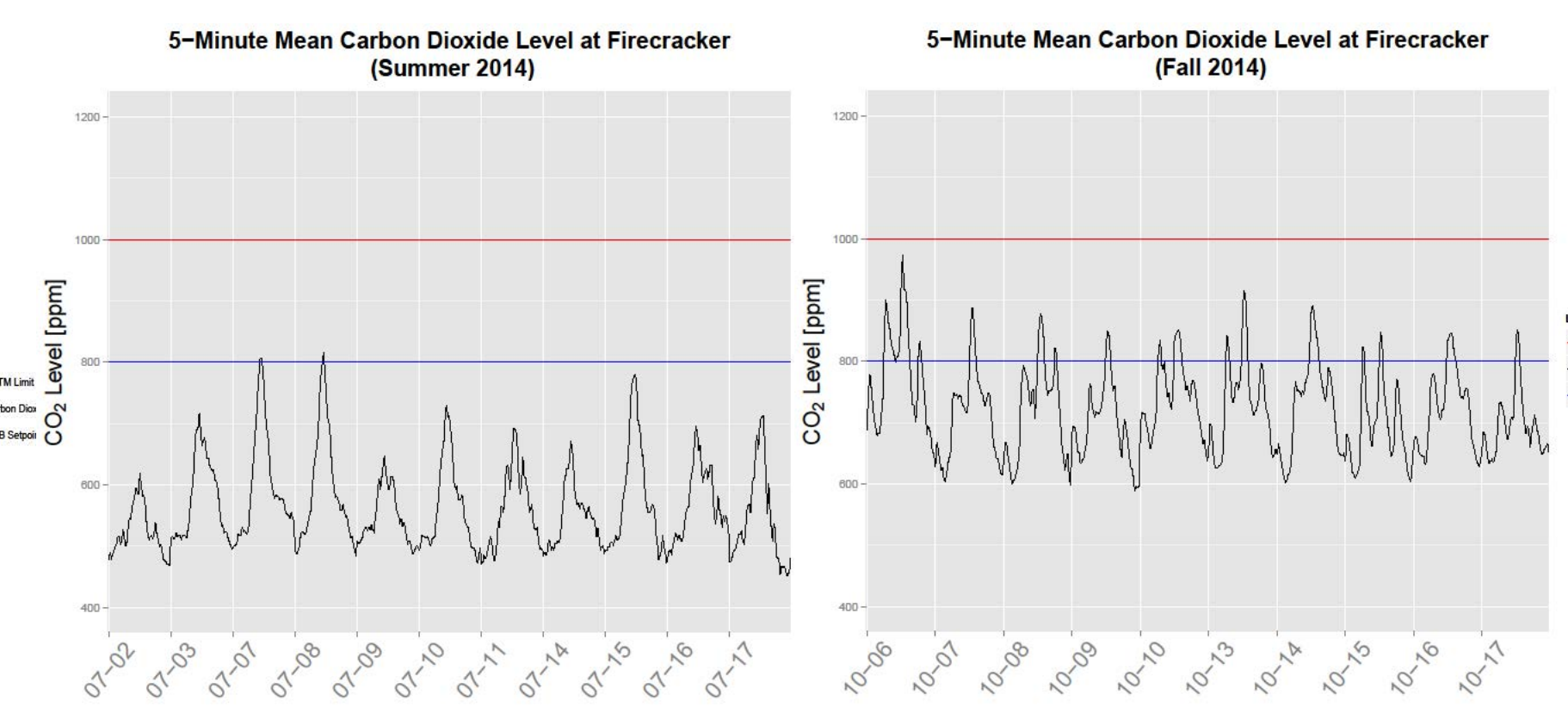
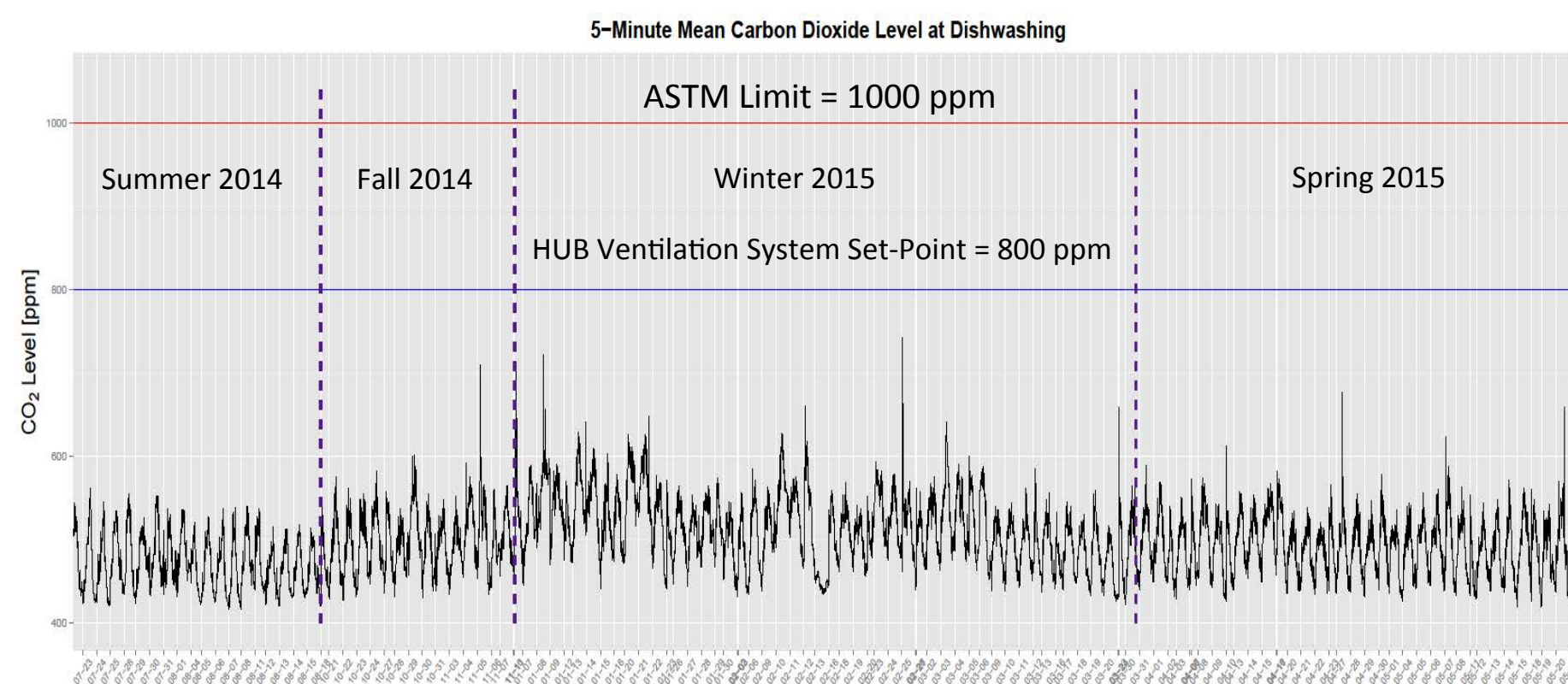
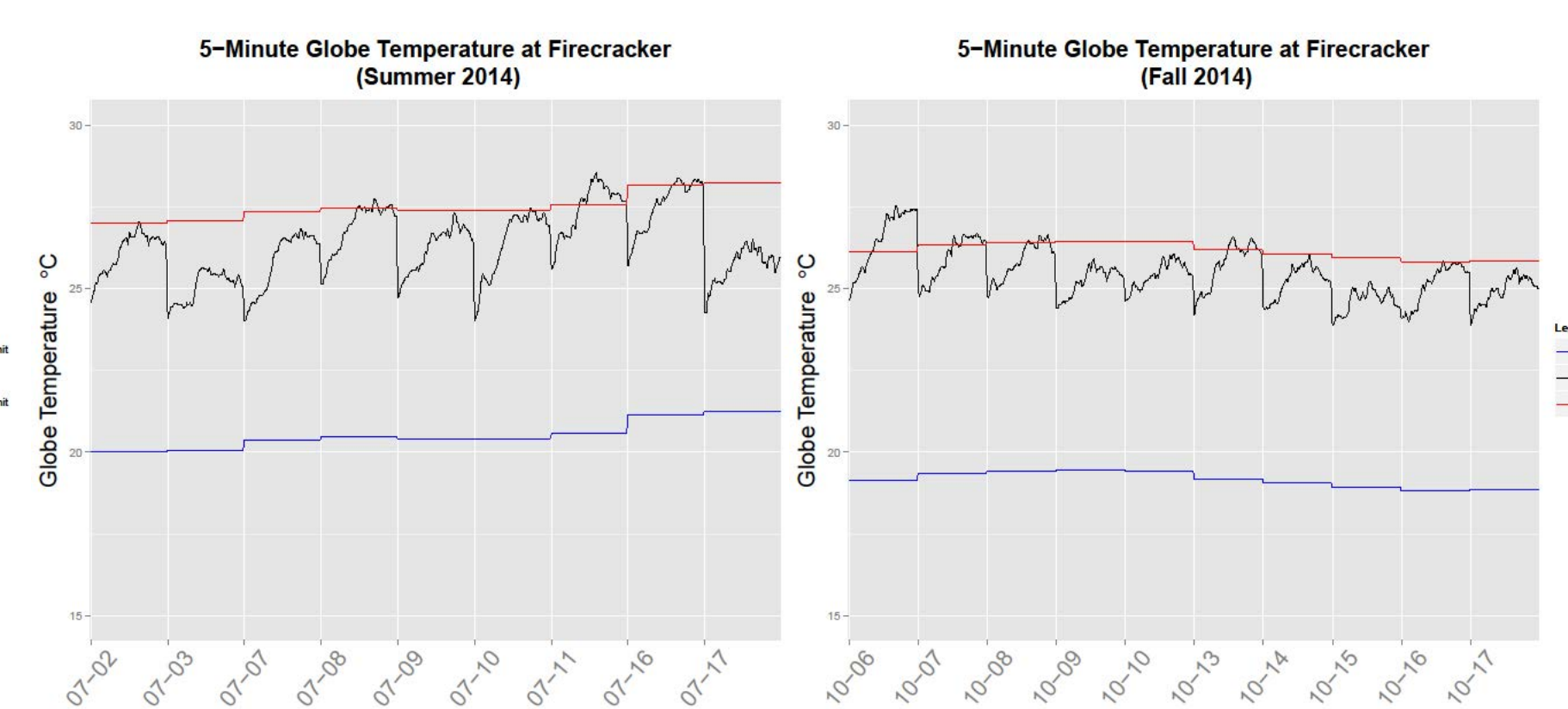
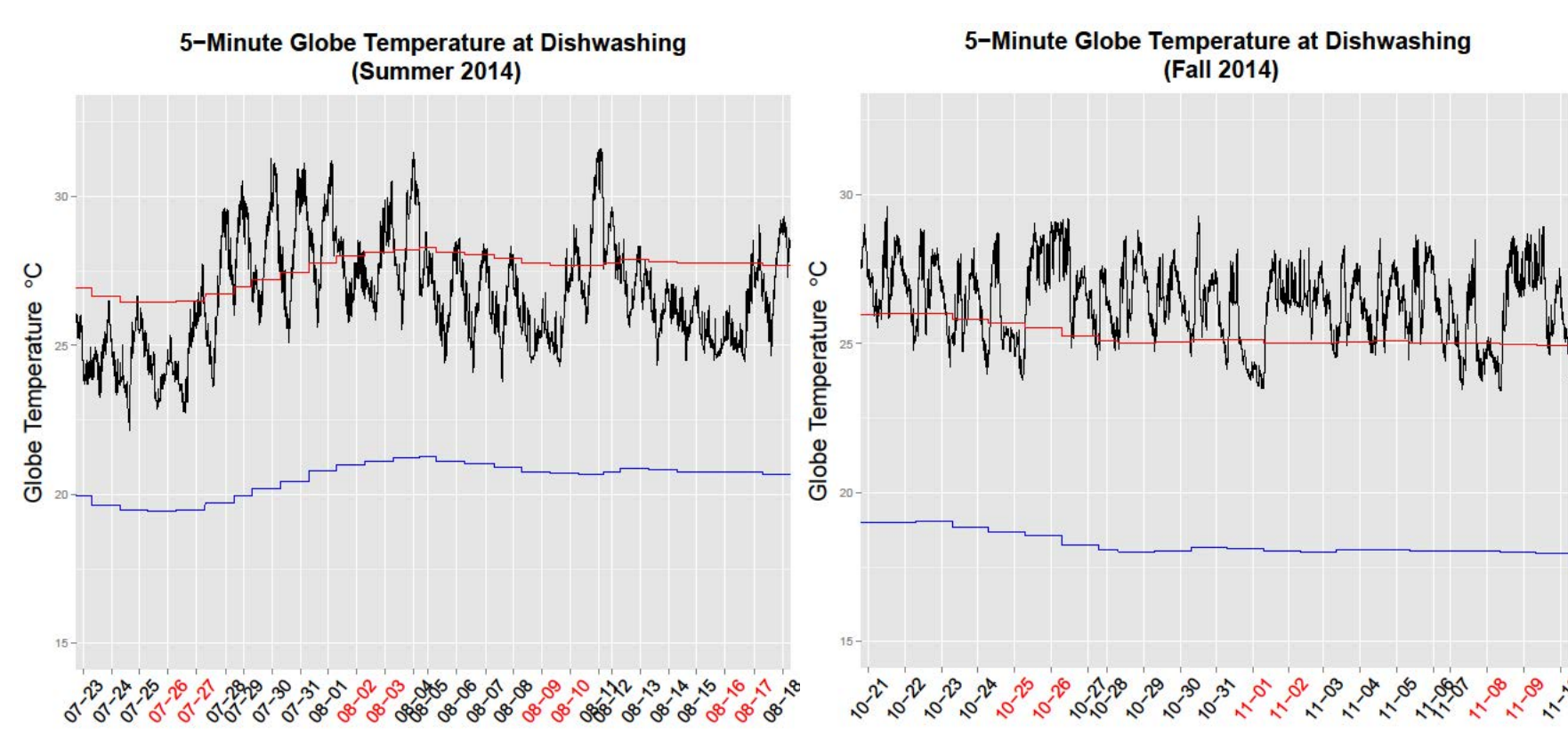
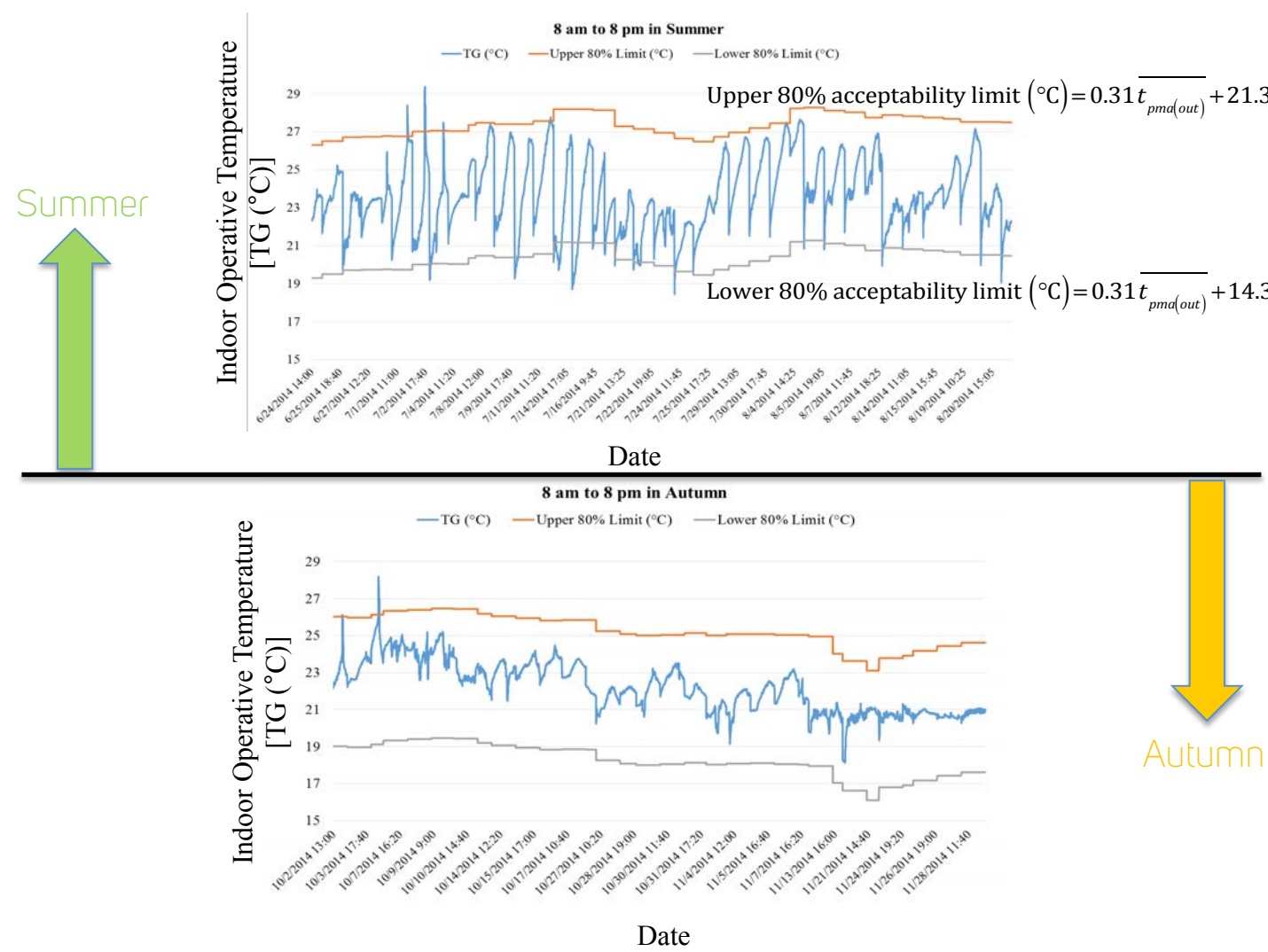
ABSTRACT

The indoor environment quality (IEQ) is an important design consideration for high performance buildings. In order to assess the IEQ performance in a LEED Gold building, we made objective measurements of physical parameters related to thermal comfort and air quality for the Husky Union Building (HUB) on the Seattle campus. These measurements were compared with subjective measurements made through occupant surveys for two locations: The third floor Student Legal Services office and the ground level Firecracker restaurant facility in the Husky Den food court. Results show that 1) the occupants are uncomfortably hot during the summer months in both locations, and 2) the CO₂ levels are too high in both locations in the autumn. The existing ASHRAE guidelines are too simplistic to assure adequate IEQ. We propose that a probability-based exceedance approach to IEQ performance be created and implemented for an improved design process. We also note that occupant behavior such as window opening affects the building IEQ and warrants further study.

SLS OFFICE

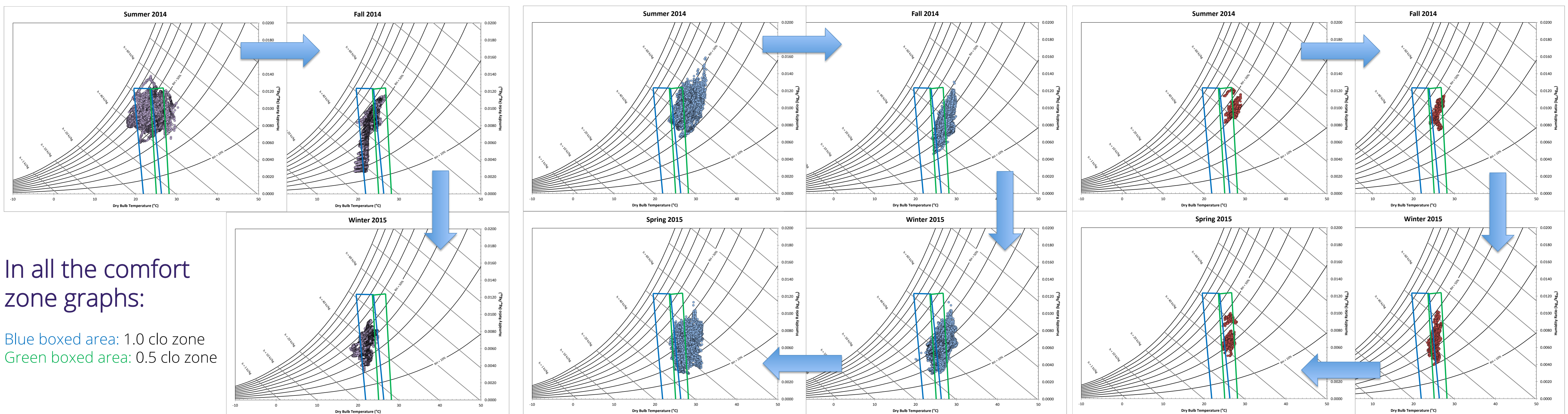
DISHWASHING

FIRECRACKER



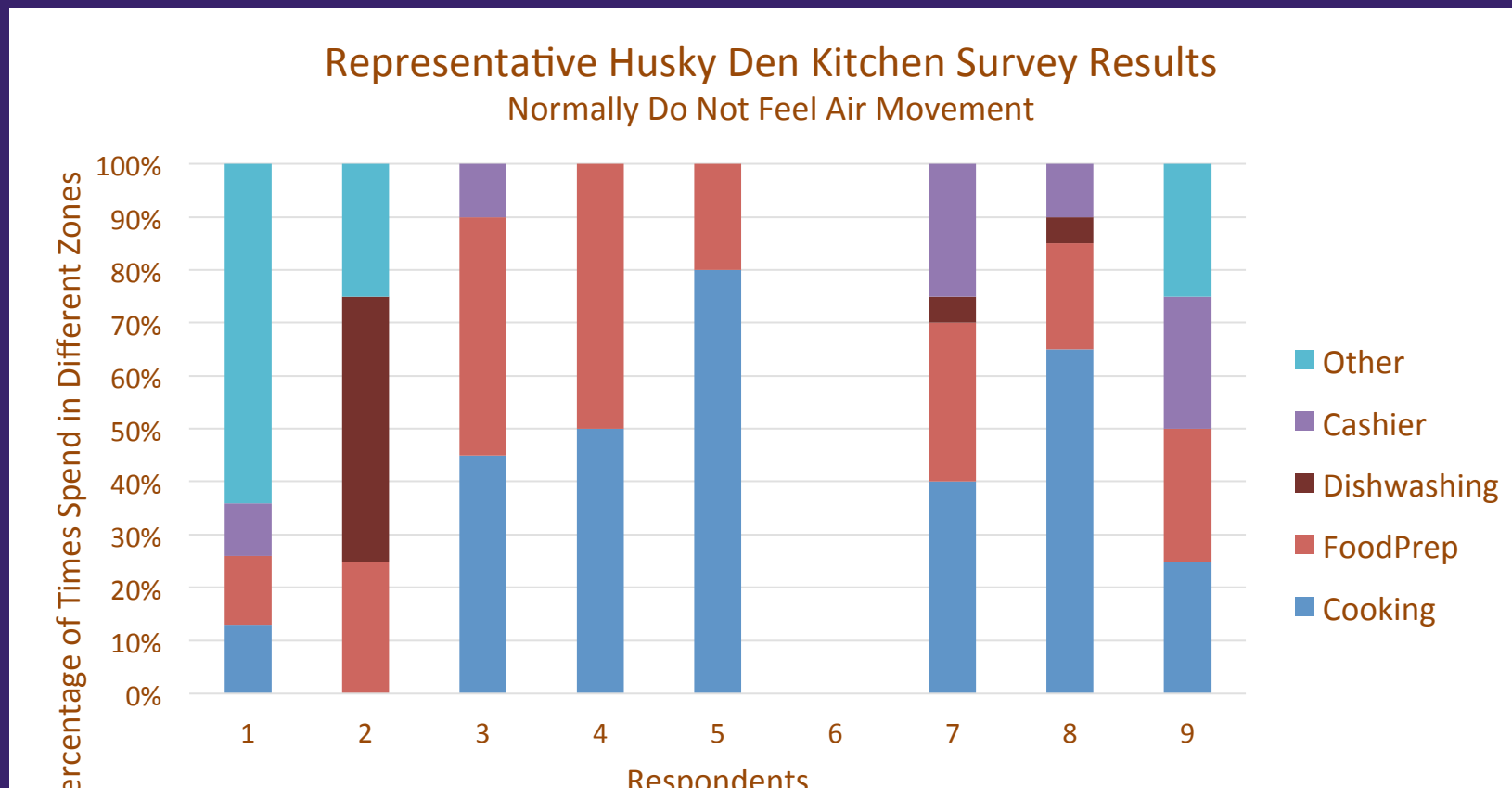
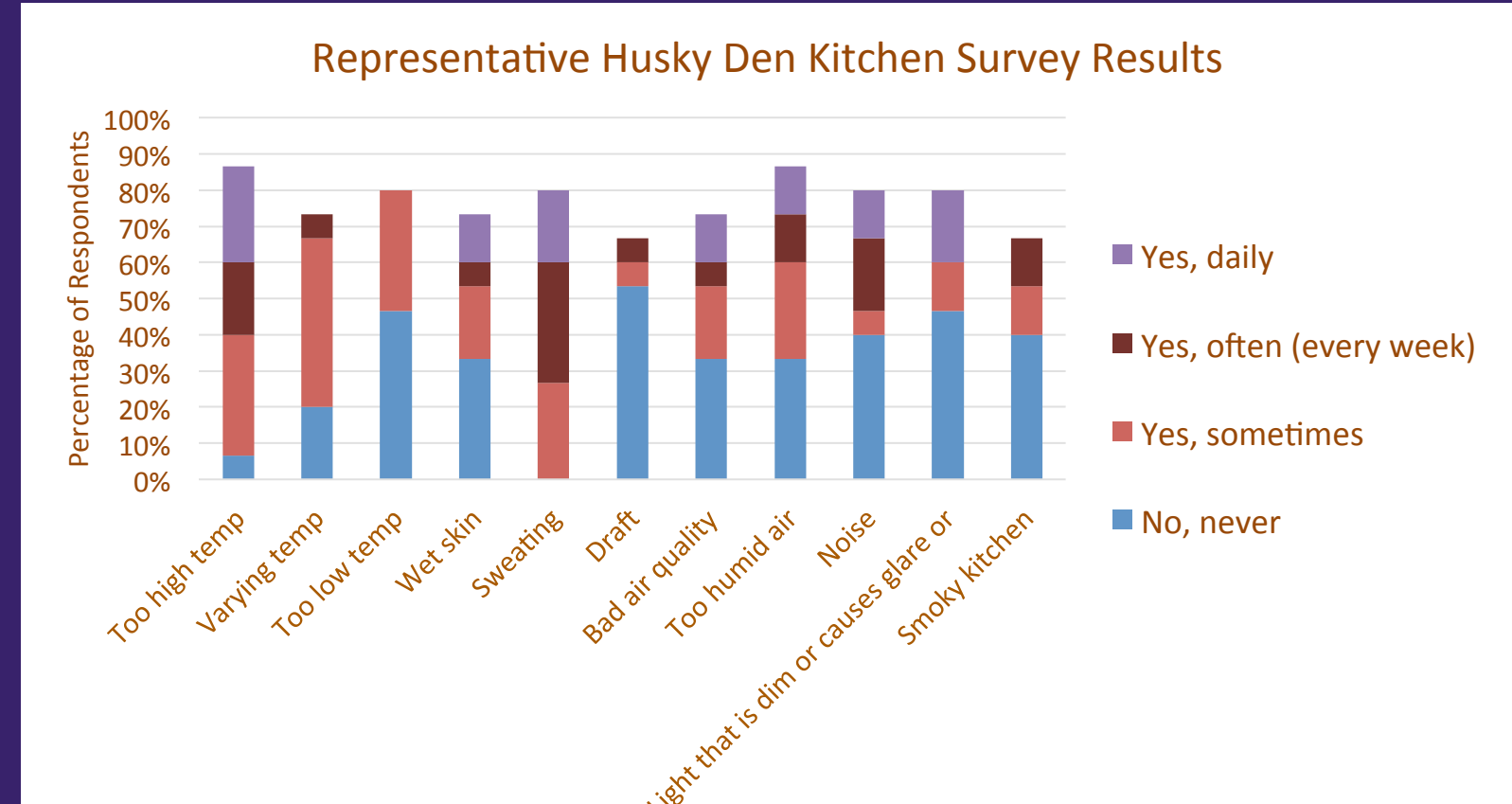
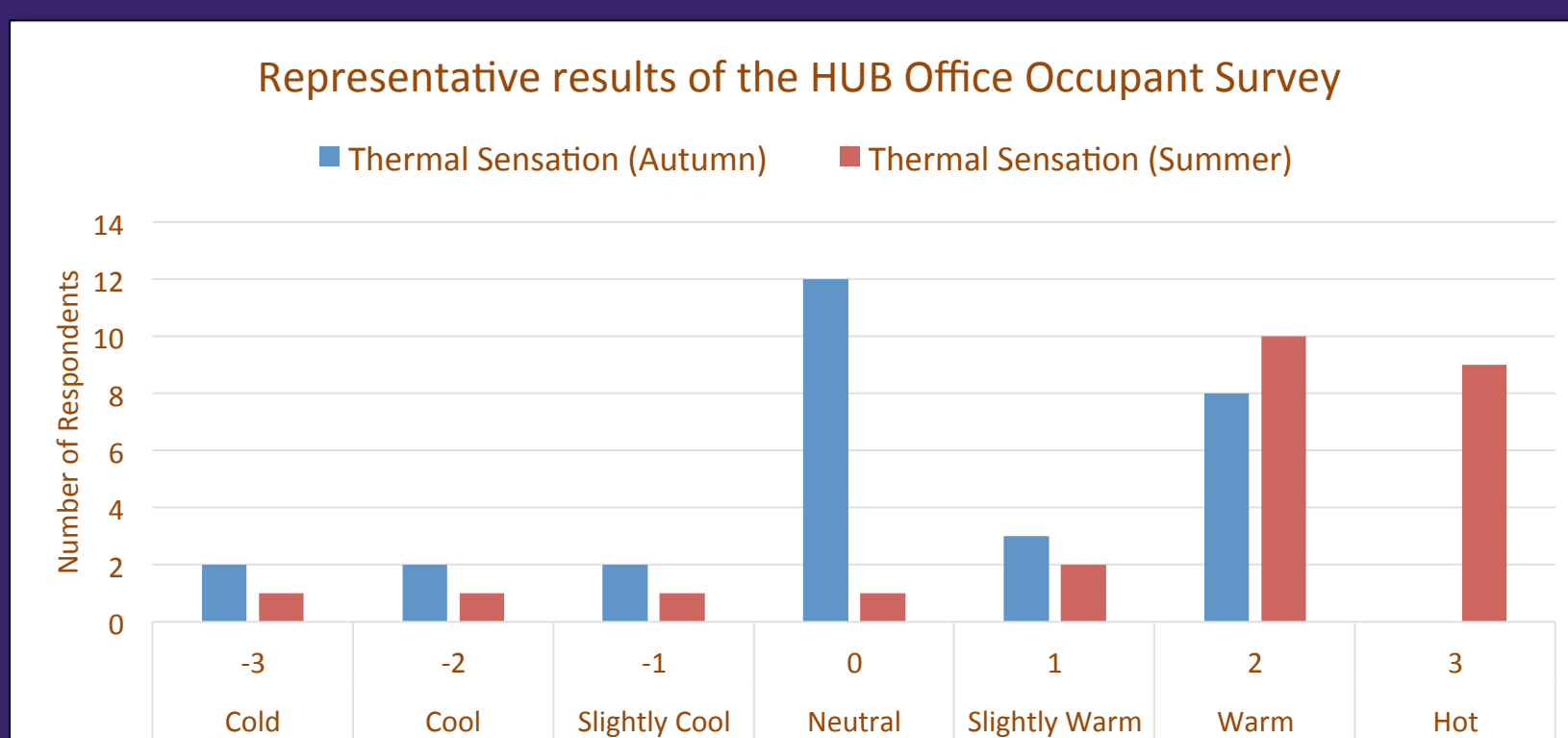
$\text{logit}(p) = a + b_1 x_1$
 p is the probability of an opening event; a is the intercept;
 b_1 is the coefficient; x_1 is the outdoor dry-bulb temperature

Independent Variable x_1	α				β_1				Model Statistic χ^2	Model p-value
	Parameter Value	Parameter Standard Error (SE)	Parameter t-statistic	Parameter p-value	Parameter Value	Parameter Standard Error (SE)	Parameter t-statistic	Parameter p-value		
Outdoor Dry-Bulb Temperature [°C]	-1.931	1.475	-1.312	0.189	0.135	0.085	1.589	0.112	2.98	0.085
Indoor Dry-Bulb Temperature [°C]	-7.861	5.621	-1.399	0.162	0.345	0.235	1.469	0.142	2.36	0.125
Indoor Globe Temperature [°C]	-8.698	6.720	-1.294	0.196	0.413	0.294	1.406	0.160	2.17	0.141
Window Opening Time of Day in % of 24 hours	-0.877	1.768	-0.496	0.620	2.602	3.559	0.731	0.465	0.55	0.459
CO ₂ [ppm]	0.528	1.168	0.452	0.651	-0.0002	0.002	-0.111	0.911	0.01	0.912



In all the comfort zone graphs:
 Blue boxed area: 1.0 clo zone
 Green boxed area: 0.5 clo zone

Survey Results



CREDITS

We would like to thank HUB Associate Director Paul Zuchowski; Carole A. Grayson, JD, Director of Student Legal Services, and Dale T. Askew, General Manager of the Husky Den. We would also like to thank all the employees who filled out surveys.

