

AoC
2004



TEAM E!!!!!!!!!!!!!!
(and "E" is for "EXCITED"!!!!!!!!!!!!!!)

Dark Rooms, Dark Deeds?

A photograph of a person in silhouette working at a desk in a dimly lit room with large windows. The person is standing and looking out the window. The desk is cluttered with papers, a laptop, and other items. A large map is on the wall, and a poster titled 'Economics' is visible on the right. The room has a slanted ceiling and large windows that let in bright light, creating a strong contrast with the dark interior.

Agents of Change

Team E

Woods Hole Research Center

October 15, 2004

TEAM MEMBERS

Ana “Santa” Maria Corzo

“Babbling” Brooke Harrington

Nathan “Famous” Patrick

“Tofu” Hofu Wu

The “Leaders”:

Heidi Spaly

Bruce Haglund



HYPOTHESIS

Regardless of orientation, the natural illumination of the offices on the third floor is within 10% of each other.



METHODOLOGY

1. Location

- 3rd floor offices on perimeter of building
- NE, NW, SE, and SW orientations

2. Distance between illuminance readings

- 1 ft, 5 ft, and 9 ft from windows



METHODOLOGY

3. Time increments

- Mid-morning
(~9:45 am)
- Early afternoon
(~12:45 pm)



4. Measurements taken

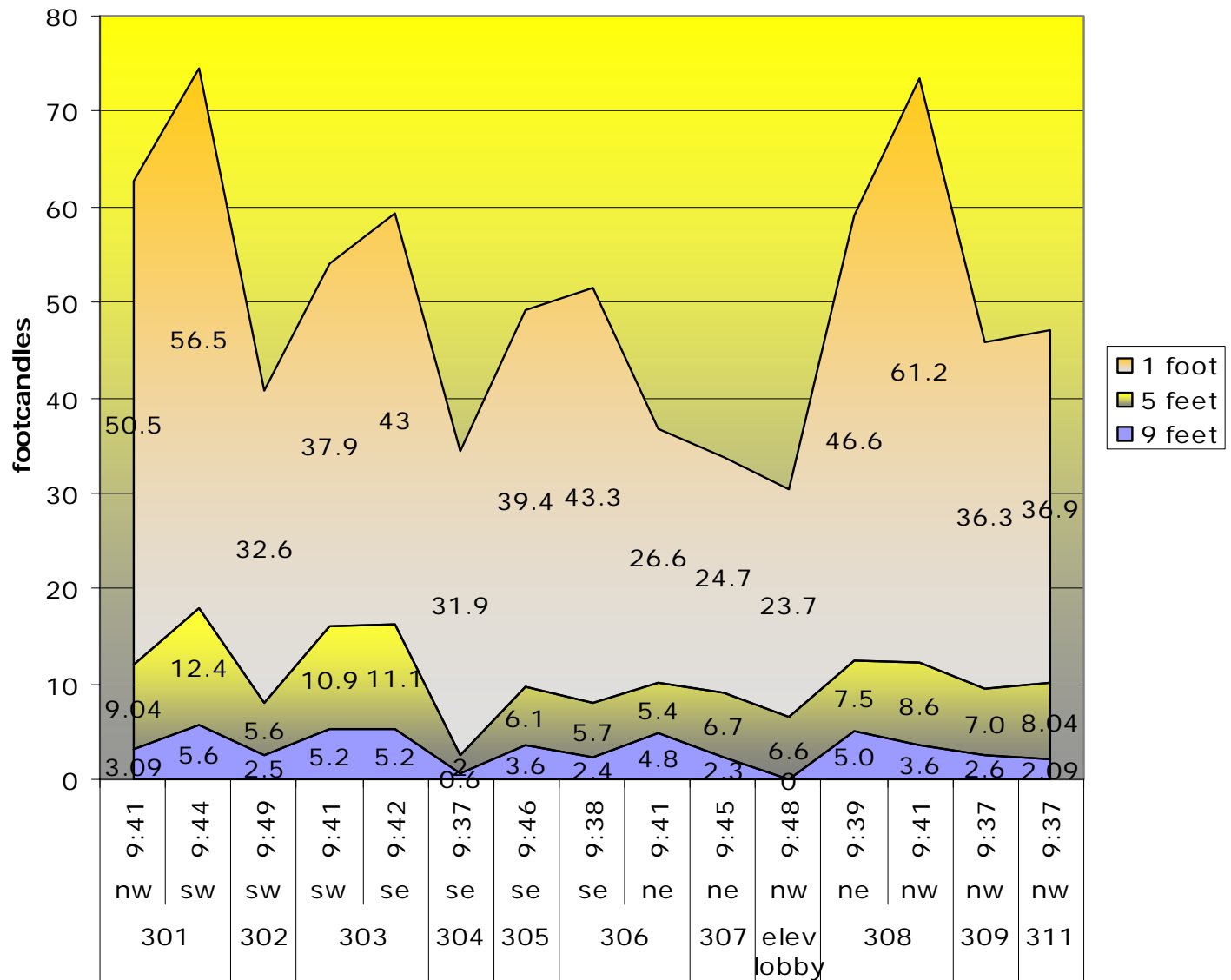
- Light levels in footcandles at 3 different locations in each office at about the same time
- Actual natural daylight levels on roof in lux

EQUIPMENT

1. (4) Osram Sylvania light meters, model DS 2050
2. (4) 30-in. wooden dowel rods
3. (1) Li-Cor photometer, model LI-250 light meter with Li-Cor photometric PH-6342

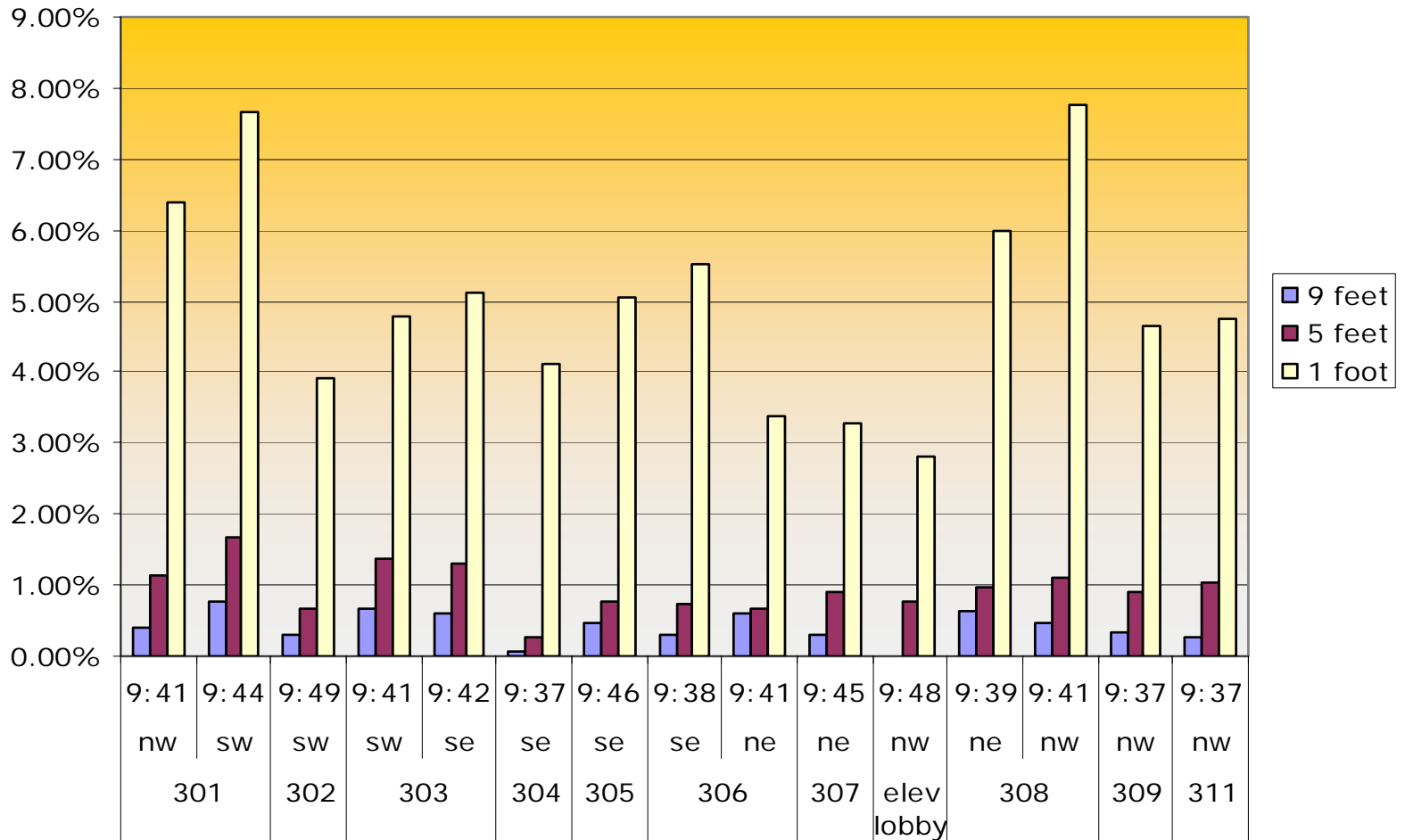


DATA & ANALYSIS

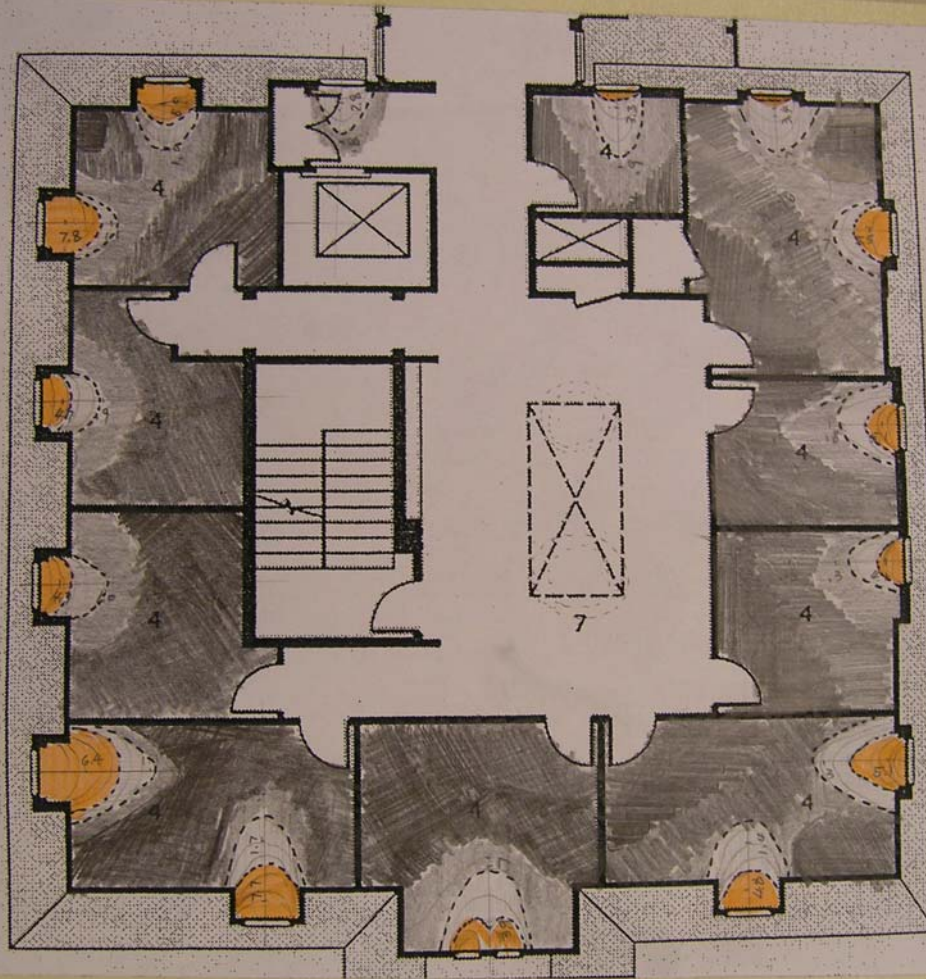


DATA & ANALYSIS

Daylight Factors in Offices



DATA & ANALYSIS



- Outdoor daylight levels around 790 fc

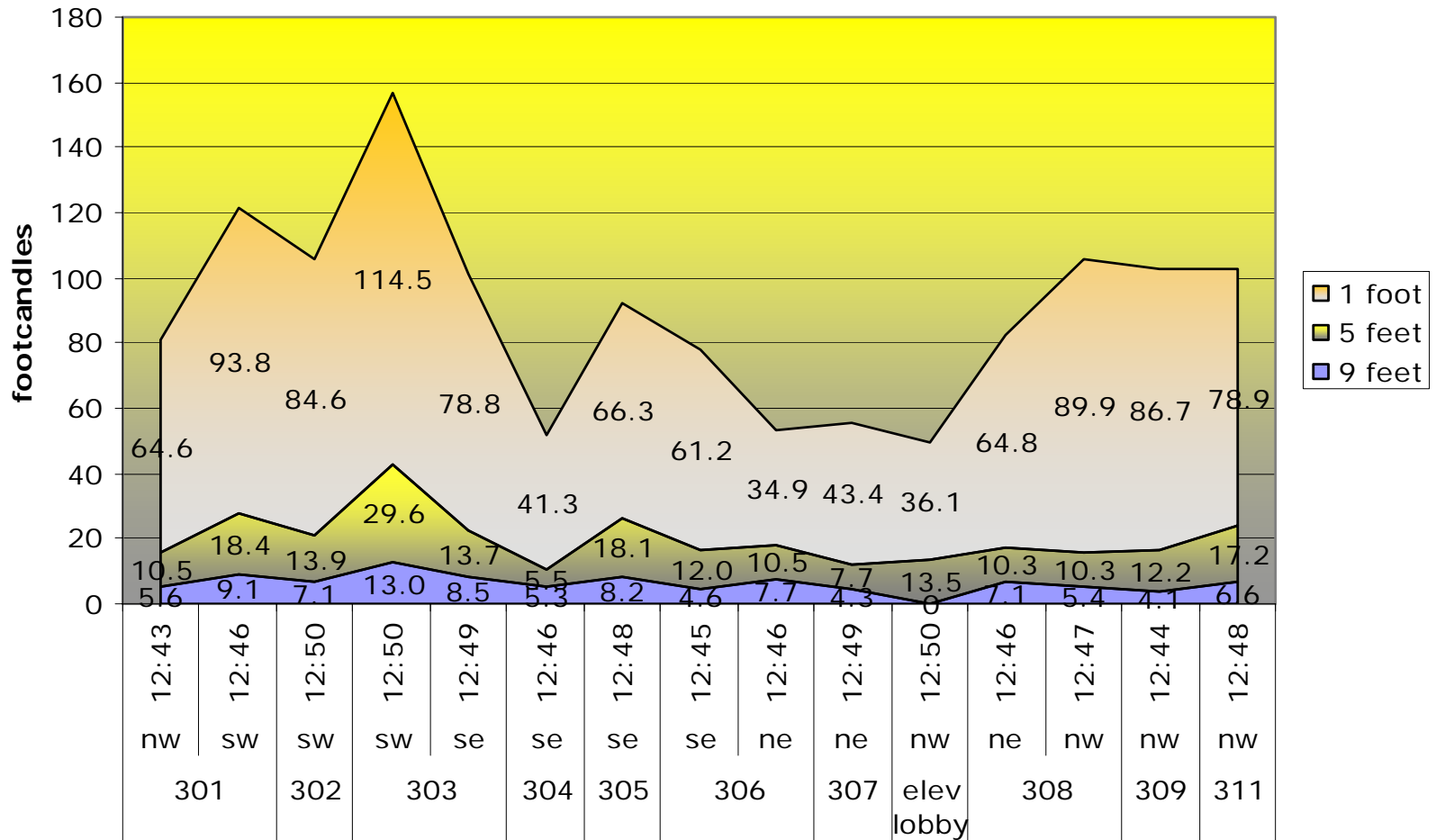
- Orange shade is DF > 5%

- Light gray shade is DF > 1%

- Dark gray shade is DF < 0.5 %

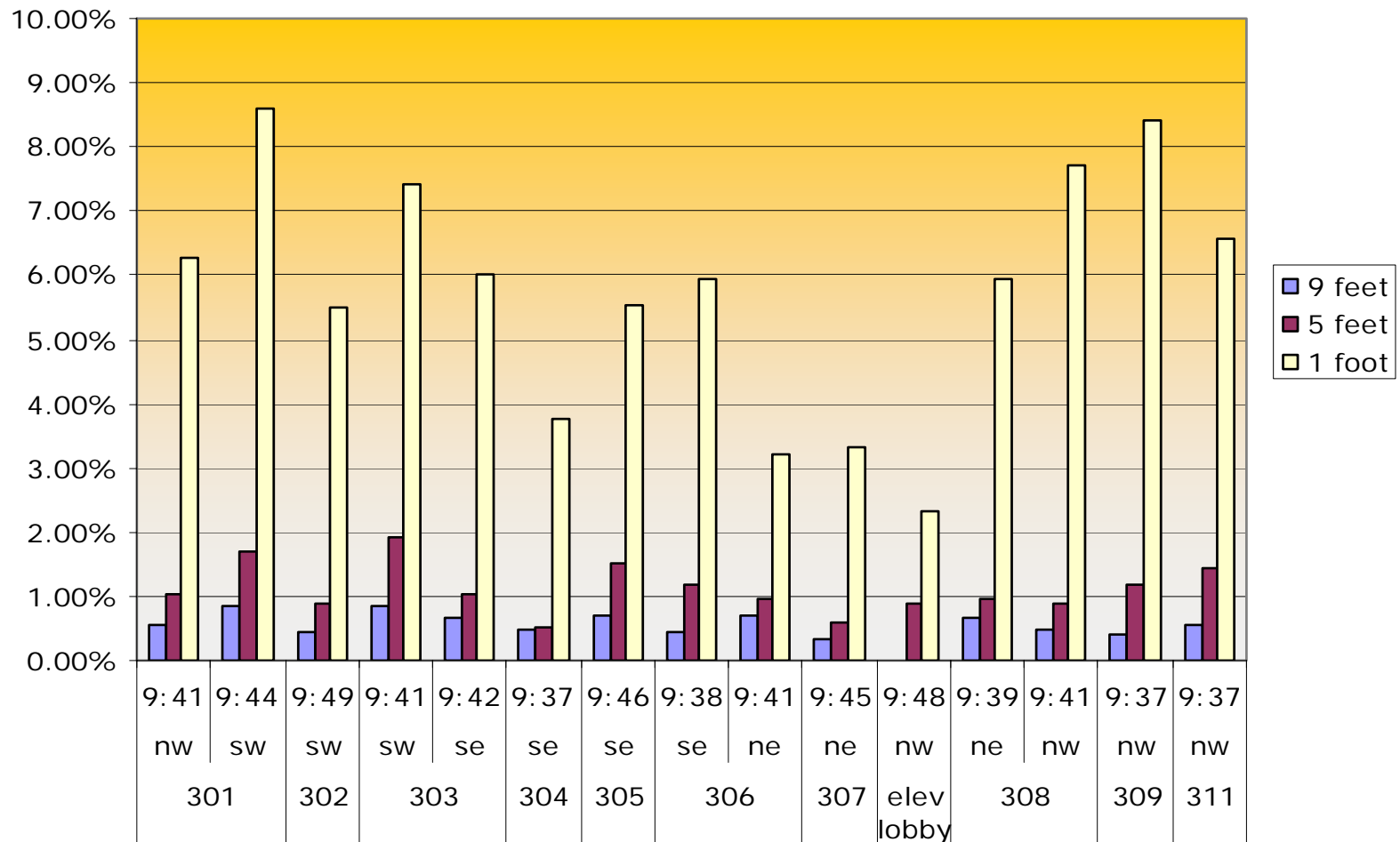
DATA & ANALYSIS

PM Daylight Readings



DATA & ANALYSIS

PM Daylight Factors in Offices

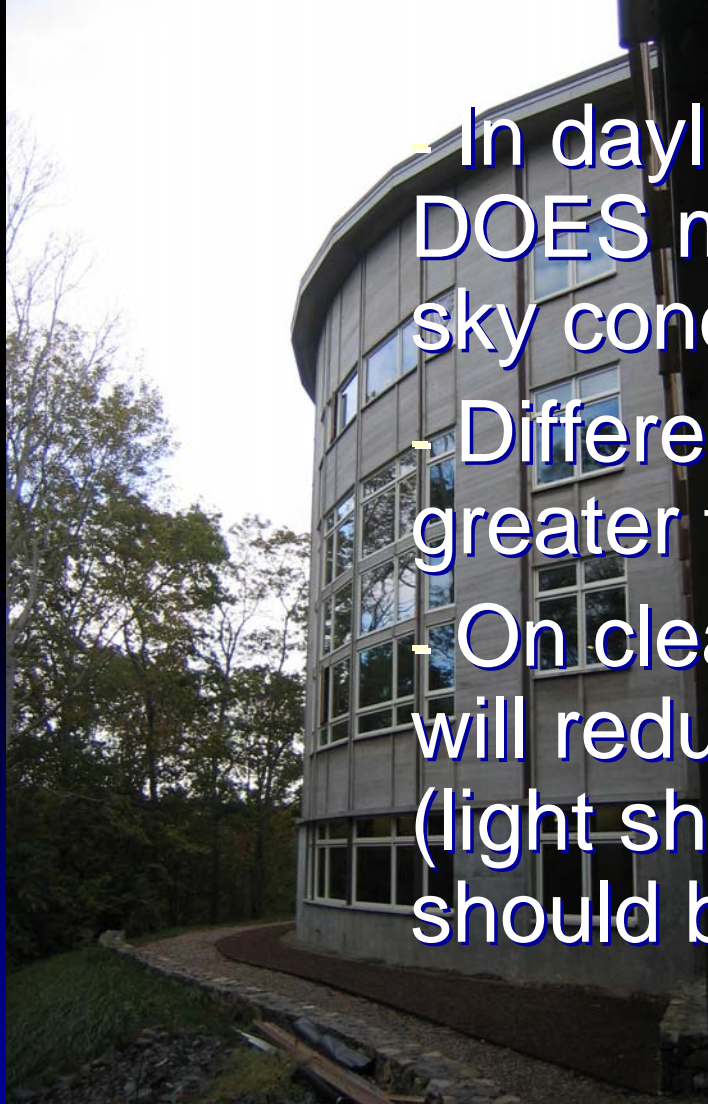


CONCLUSIONS

	Room 307	305	302	311	306	303	301
Room 307		60%	54%	59%	38%	44%	65%
305			40%	5%	36%	30%	11%
302				37%	7%	14%	46%
311					33%	27%	14%
306						9%	43%
303							38%
301							

CONCLUSIONS

- In daylight performance, orientation DOES matter, even under overcast sky conditions
- Differences among rooms is WAY greater than 10%
- On clear days, pull-down shades will reduce daylight performance (light shelves or horizontal shades should be considered)



LESSONS LEARNED

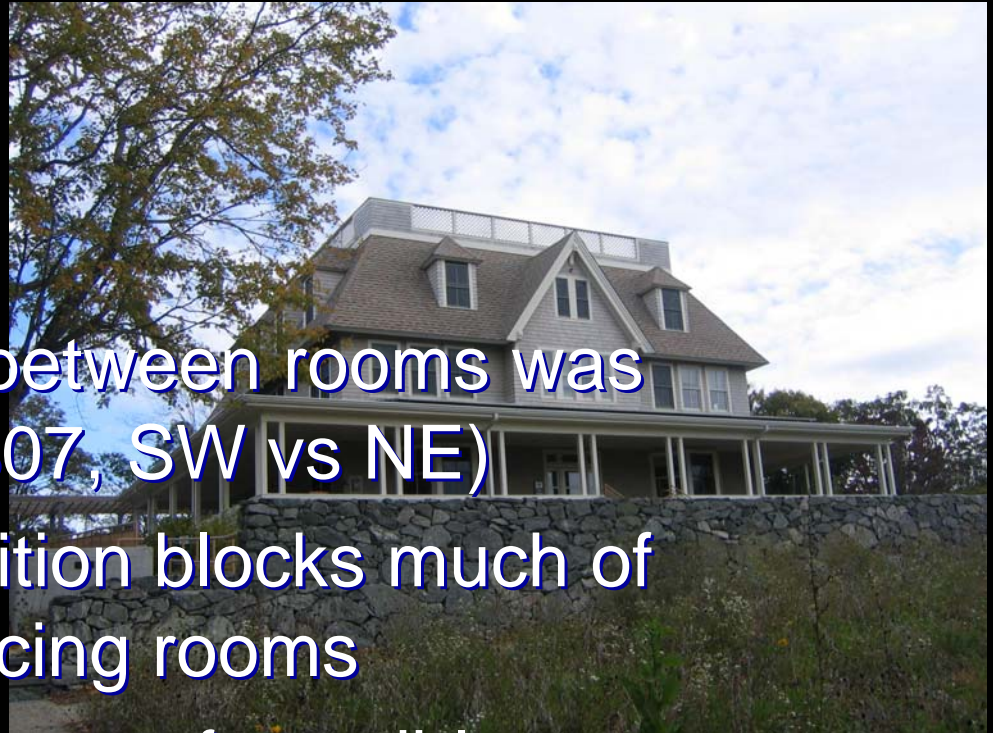
- Maximum difference between rooms was 65% (rooms 301 and 307, SW vs NE)

- The new building addition blocks much of the light to the north-facing rooms

- Dormers reduced amount of possible daylight penetrations into offices

- Instrument calibration is critical

- Teamwork is very important



LIFE APPLICATION LESSONS

- Bubbles are sticky...



- Plants in front of windows are bad...