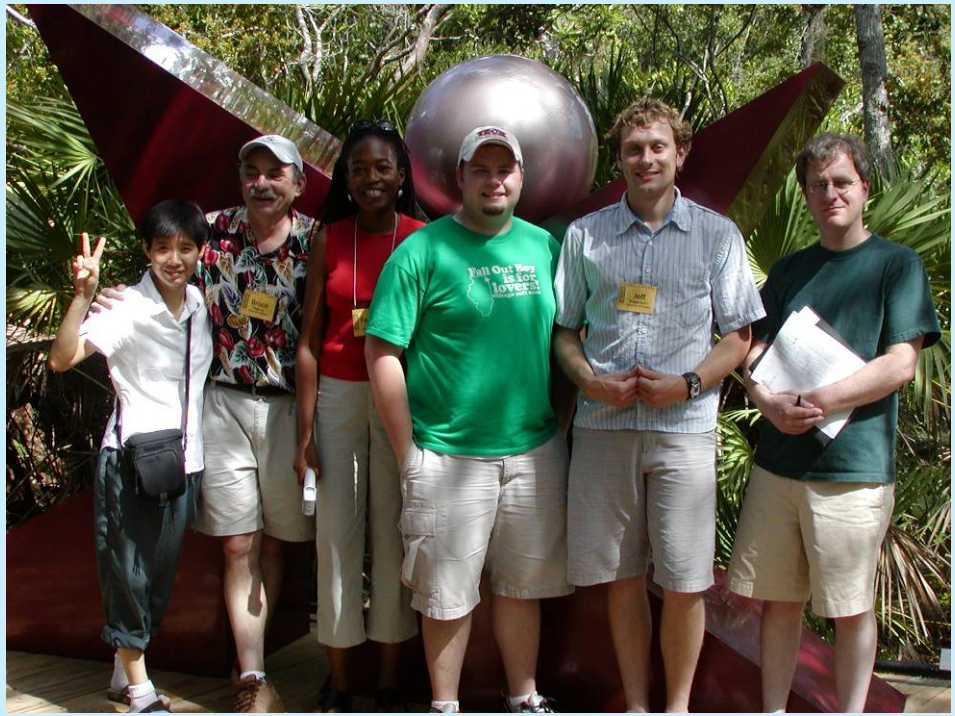

Bakin’ on the Boardwalk

Case Study Team Members

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Case study of the Doris Leeper Boardwalk at the Atlantic Center for the Arts was undertaken 4 August–5 August 2005. Our team focused on determining the microclimates present on the boardwalk that weaves between mangroves and buildings. We were inspired to do this study as we walked along the boardwalk and experienced thermal and visual variations on the path. Were these sensory perceptions something that could be defined as microclimates? Were these perceived microclimates figments of our imagination or reality?

Hypothesis: There are 7 microclimates along the Doris Leeper Boardwalk.

Microclimate:

Team debated what defined a microclimate, following are some of those discussions.

Microclimate is a subclimate caused by unique local anomalies and variables, including vegetation, buildings, sun and wind exposure.

Microclimate along the path is a threshold condition, indicating a change in humidity, temperature, air speed, light.

Methodology:

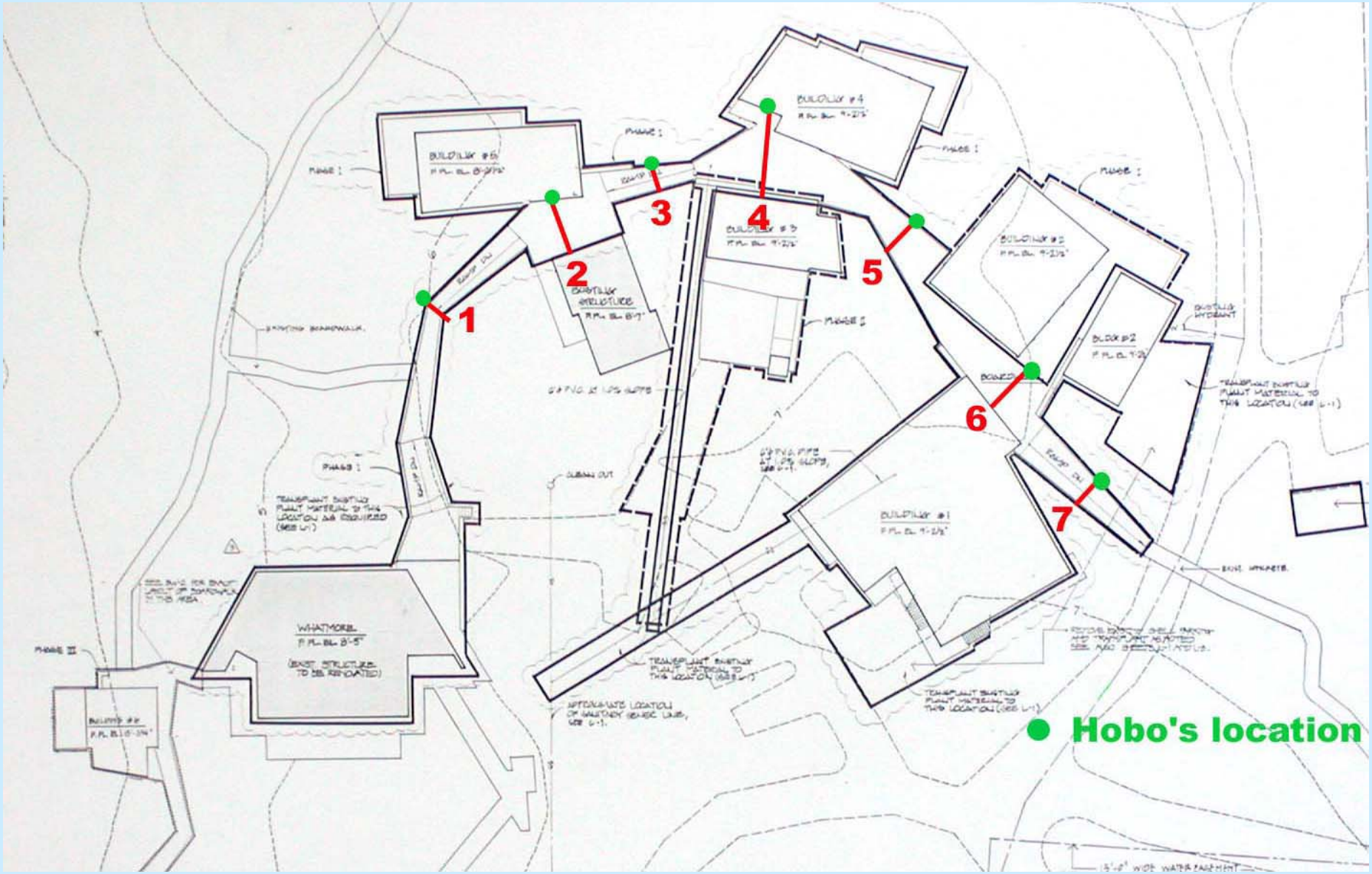
The team walked the path and marked 7 perceived changes of climate using blue tape to indicate section cuts or threshold points.

Weatherproofed 7 Hobos—placed Hobo upside-down in ventilated plastic cups, taped them in, and labeled each Hobo—to be deployed at each station. The Hobos were set for 8:00pm deployment.

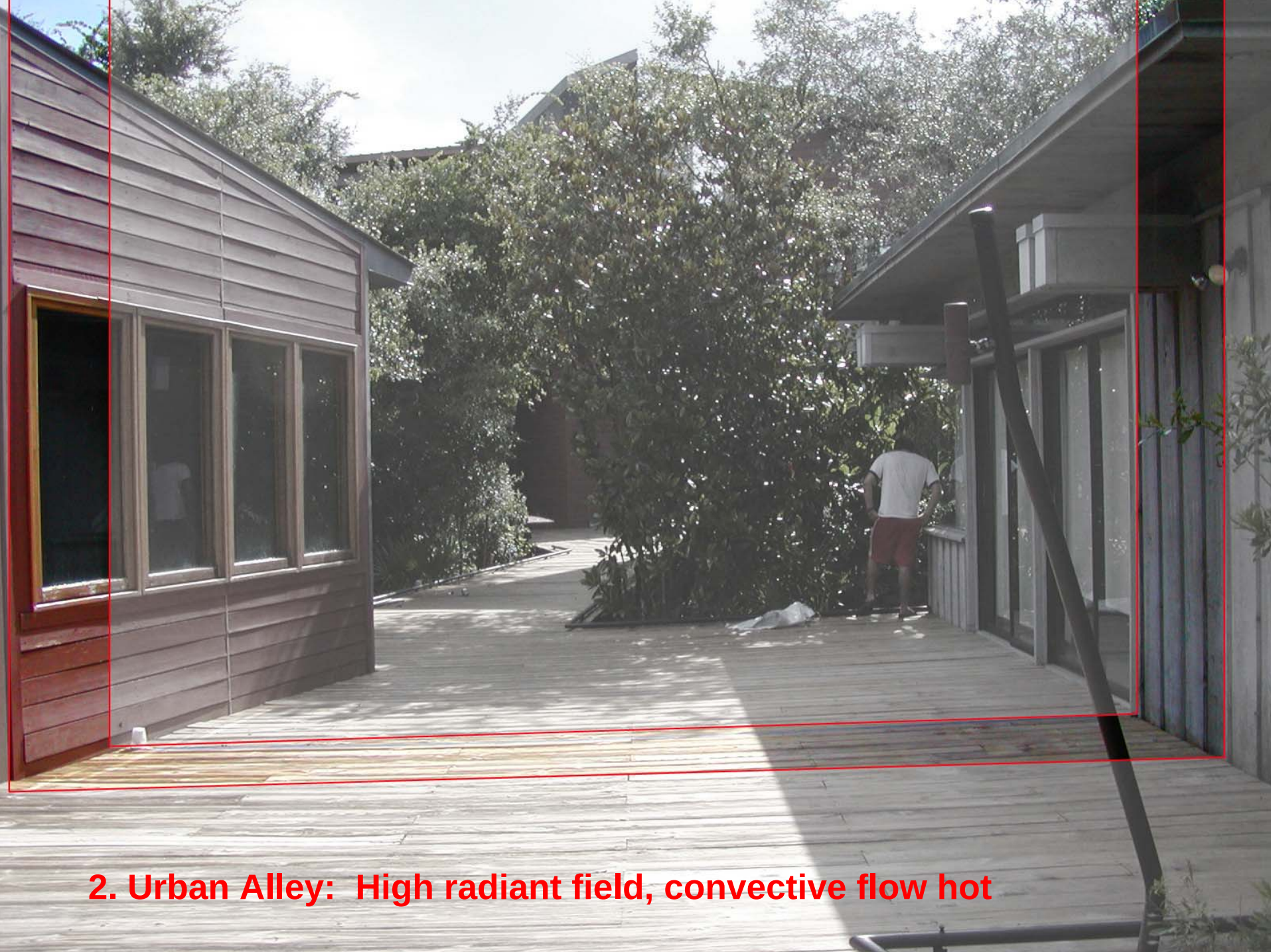
The weatherproofed Hobos were placed on the northside of each section mark and taped in place on the boardwalk.

Photographic station points were marked along the path, and photographs were taken looking east and westward of each station, at every hour along with wind speed, air temperature, relative humidity, and heat index.

At one-hour intervals, starting at 8am on 5 August, the team measured surface temperature of the sides and deck of each section cut with a Raytek and used a Kestral to measure air speed, temperature, relative humidity, and heat index. Bubbles were used to observe wind direction.


1
2
3
4
5
6
7
Hobo's location

1. East Mangrove: Cooled by breeze and vegetation

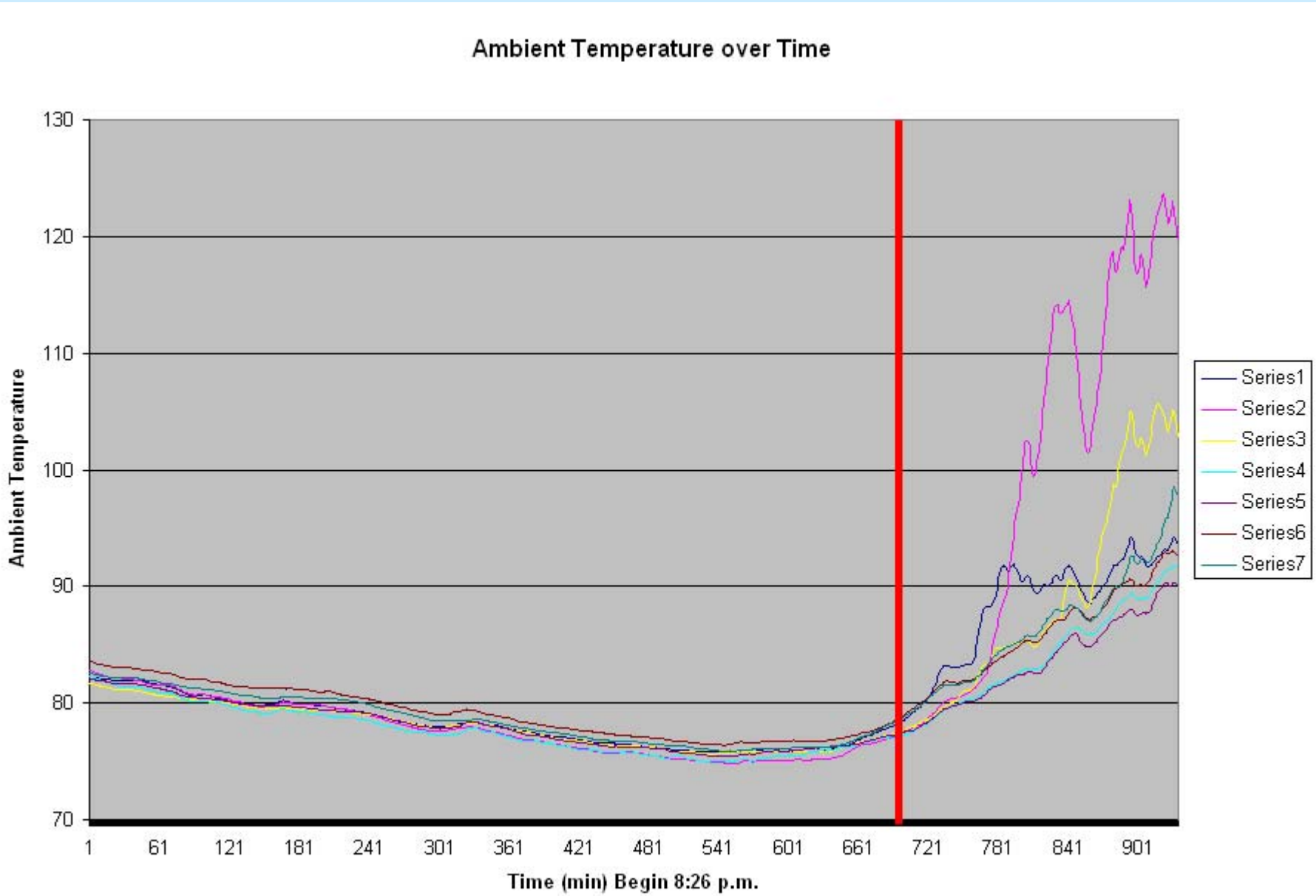


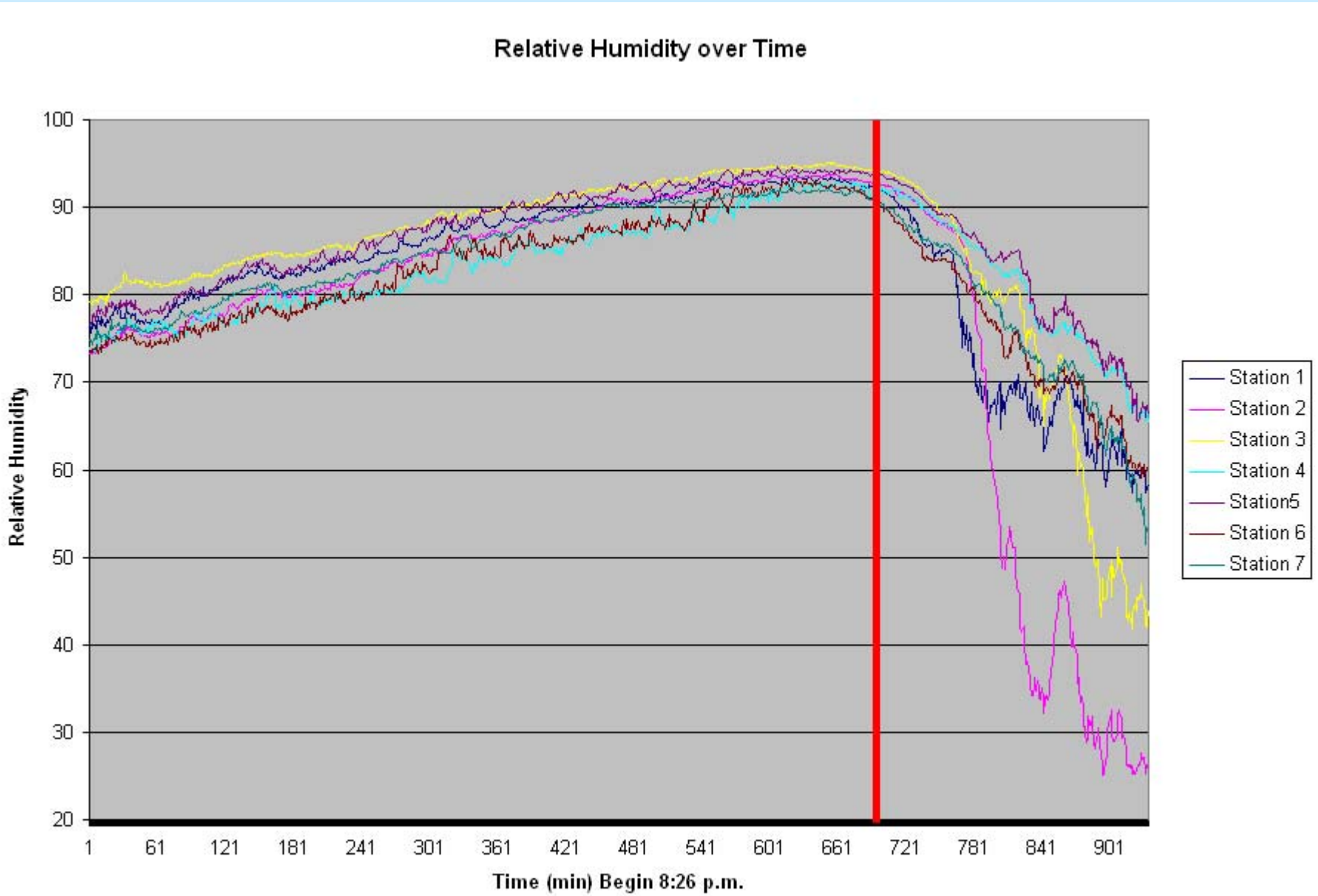
2. Urban Alley: High radiant field, convective flow hot

3. Mangrove Interlude: Still air, but shaded

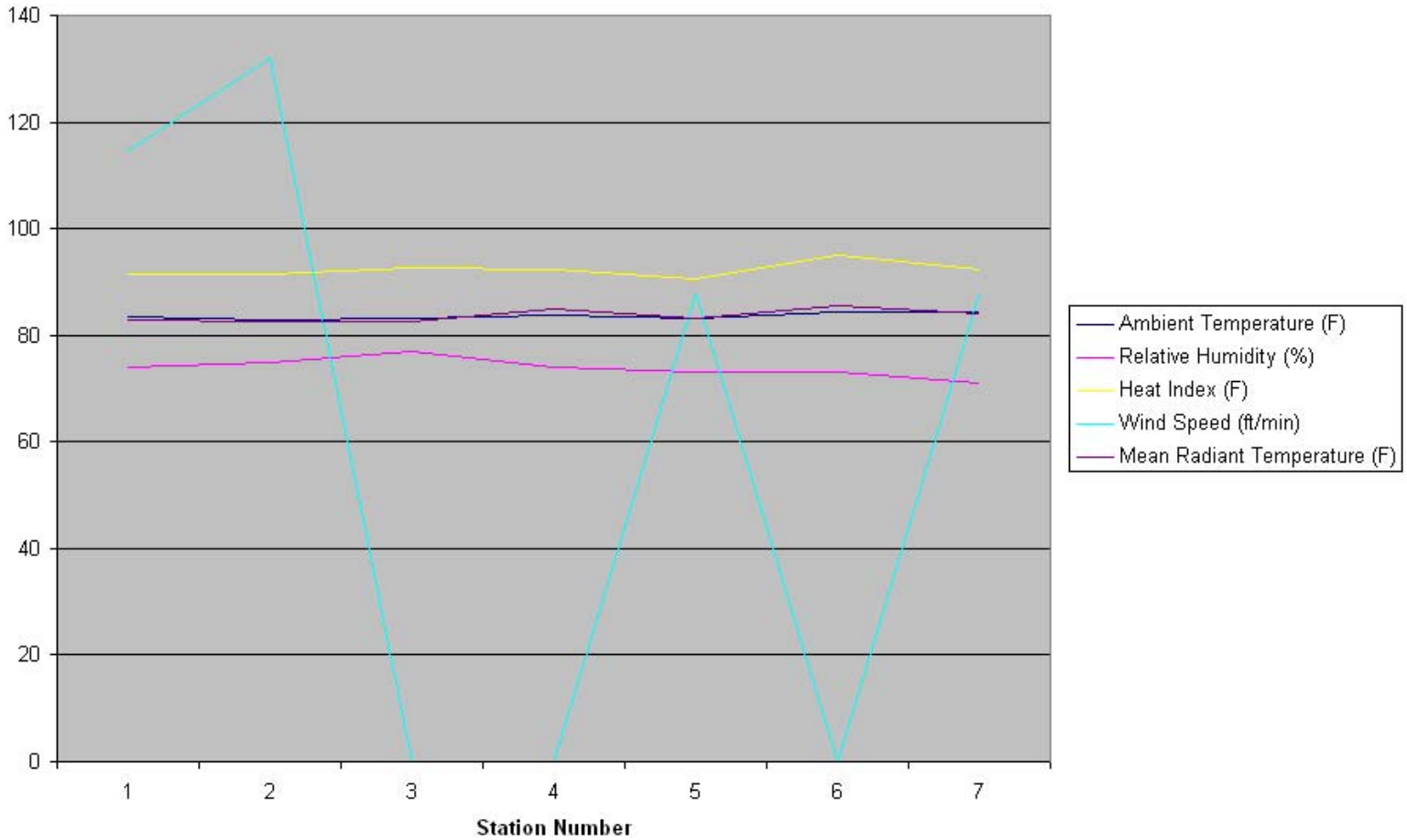
6. Urban Alley II: Ventilated by convection and warm radiant surfaces

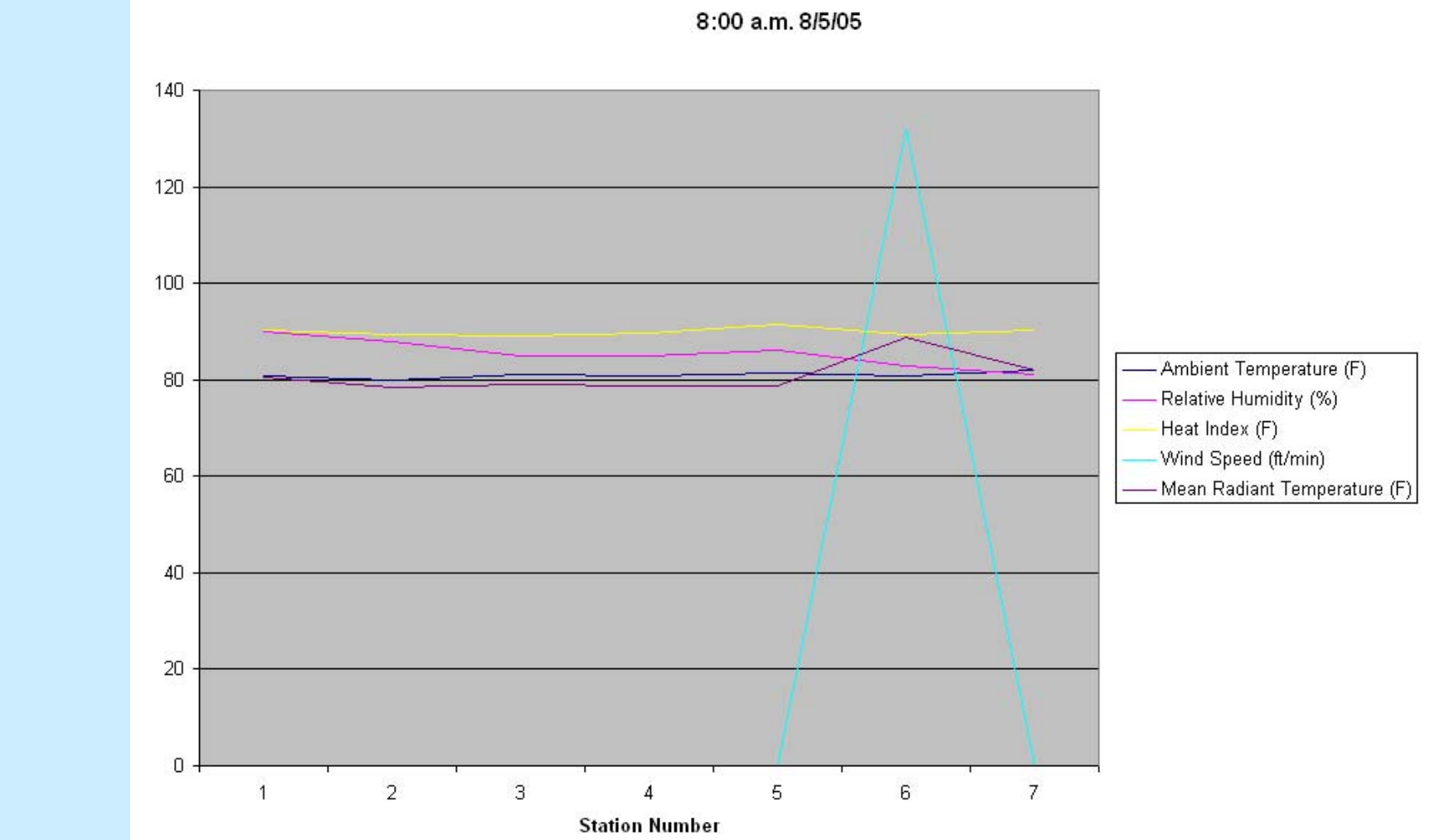
7. West Mangrove: Vegetation surrounds act as lungs


Ambient Temperature over Time
Ambient Temperature
130
120
110
100
90
80
70
1
61
121
181
241
301
361
421
481
541
601
661
721
781
841
901
Time (min) Begin 8:26 p.m.
Series1
Series2
Series3
Series4
Series5
Series6
Series7


Relative Humidity over Time
Relative Humidity
100
90
80
70
60
50
40
30
20
1
61
121
181
241
301
361
421
481
541
601
661
721
781
841
901
Time (min) Begin 8:26 p.m.
Station 1
Station 2
Station 3
Station 4
Station5
Station 6
Station 7

7:43 p.m. 8/4/05


140
120
100
80
60
40
20
0
1
2
3
4
5
6
7
Station Number
Ambient Temperature (F)
Relative Humidity (%)
Heat Index (F)
Wind Speed (ft/min)
Mean Radiant Temperature (F)


8:00 a.m. 8/5/05
140
120
100
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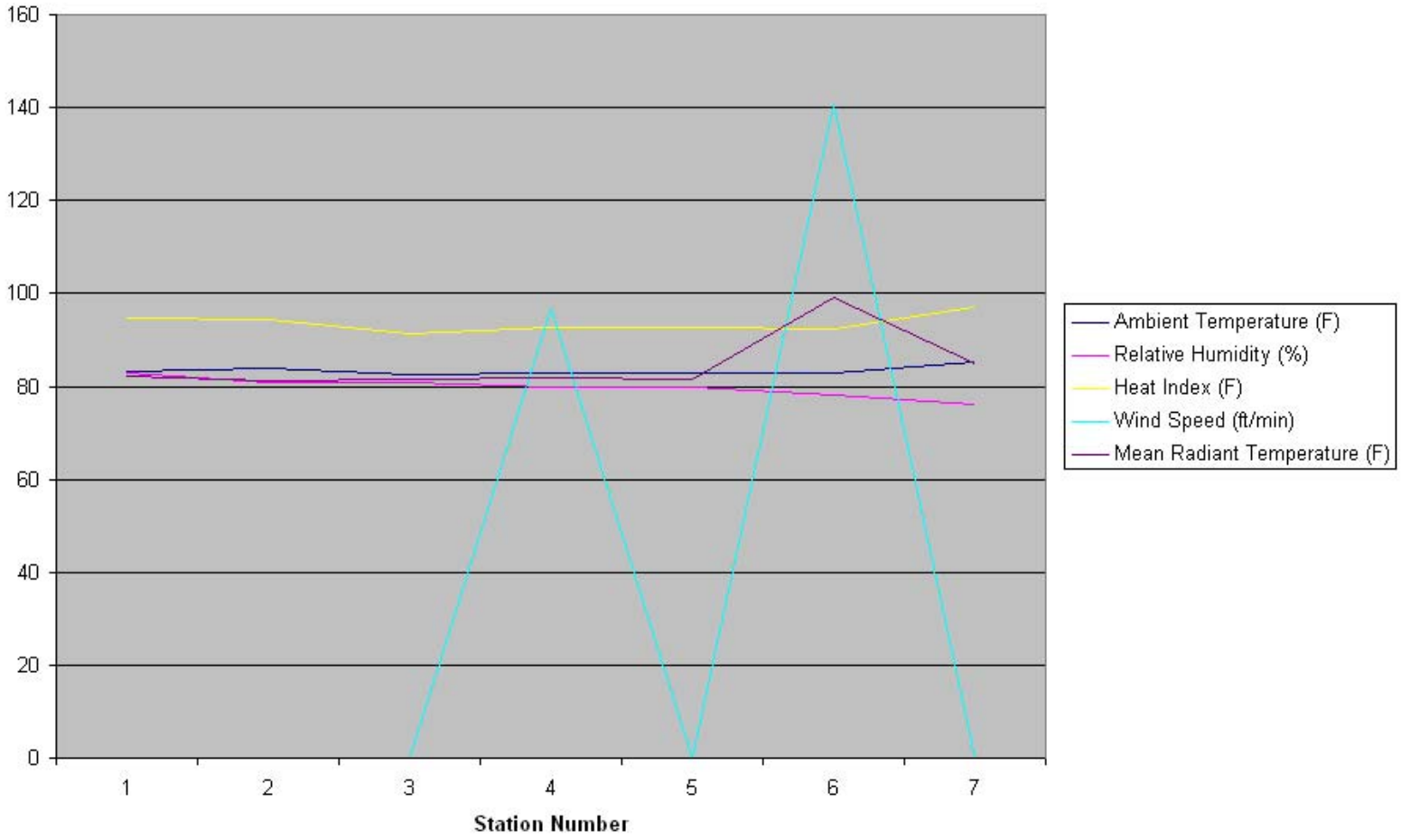
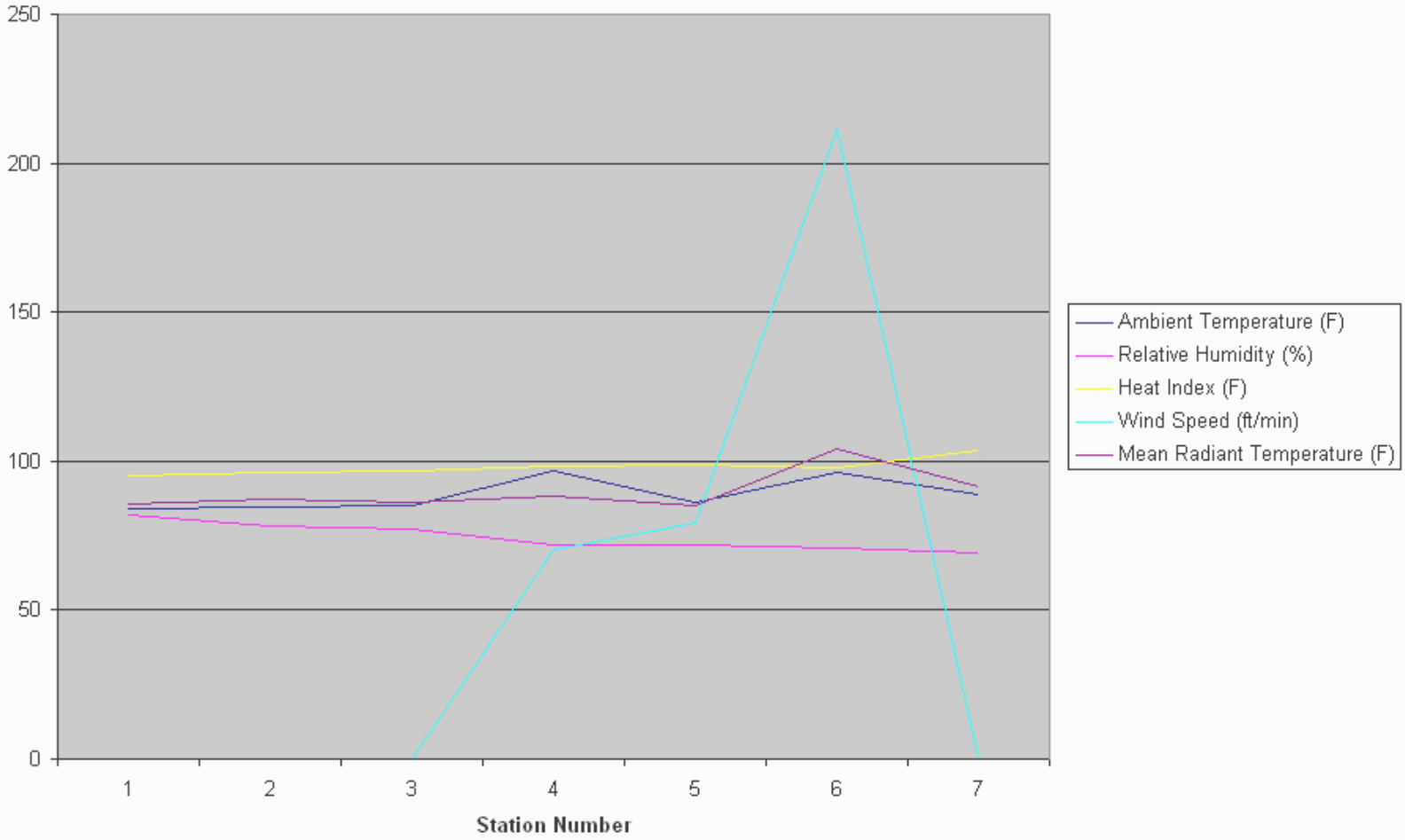
7
Station Number
Ambient Temperature (F)
Relative Humidity (%)
Heat Index (F)
Wind Speed (ft/min)
Mean Radiant Temperature (F)

9:00 a.m. 8/5/05


160
140
120
100
80
60
40
20
0
1
2
3
4
5
6
7
Station Number
Ambient Temperature (F)
Relative Humidity (%)
Heat Index (F)
Wind Speed (ft/min)
Mean Radiant Temperature (F)

10:00 a.m. 8/5/05


250
200
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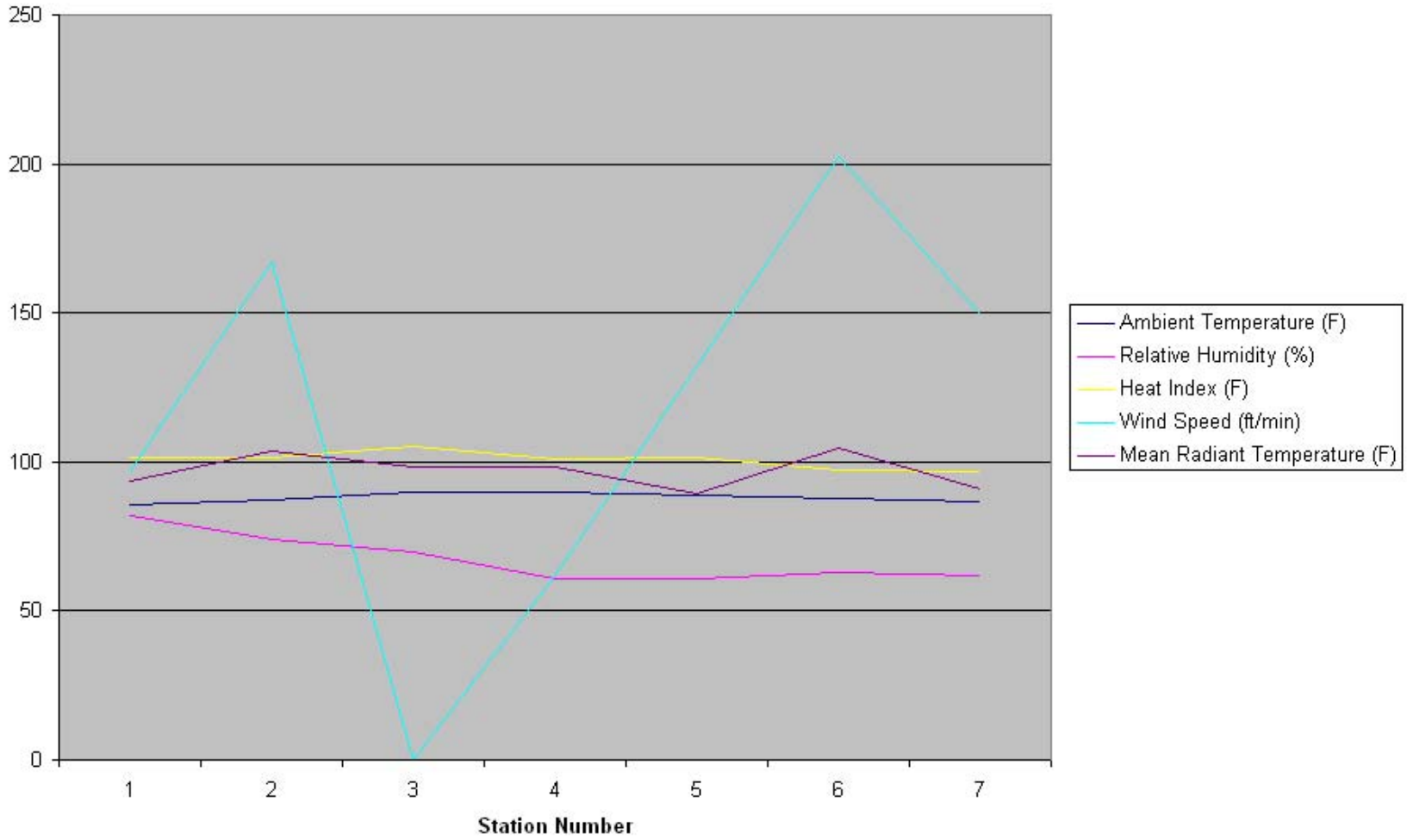
6
7
Station Number
Ambient Temperature (F)
Relative Humidity (%)
Heat Index (F)
Wind Speed (ft/min)
Mean Radiant Temperature (F)

11:00 a.m. 8/5/05


250
200
150
100
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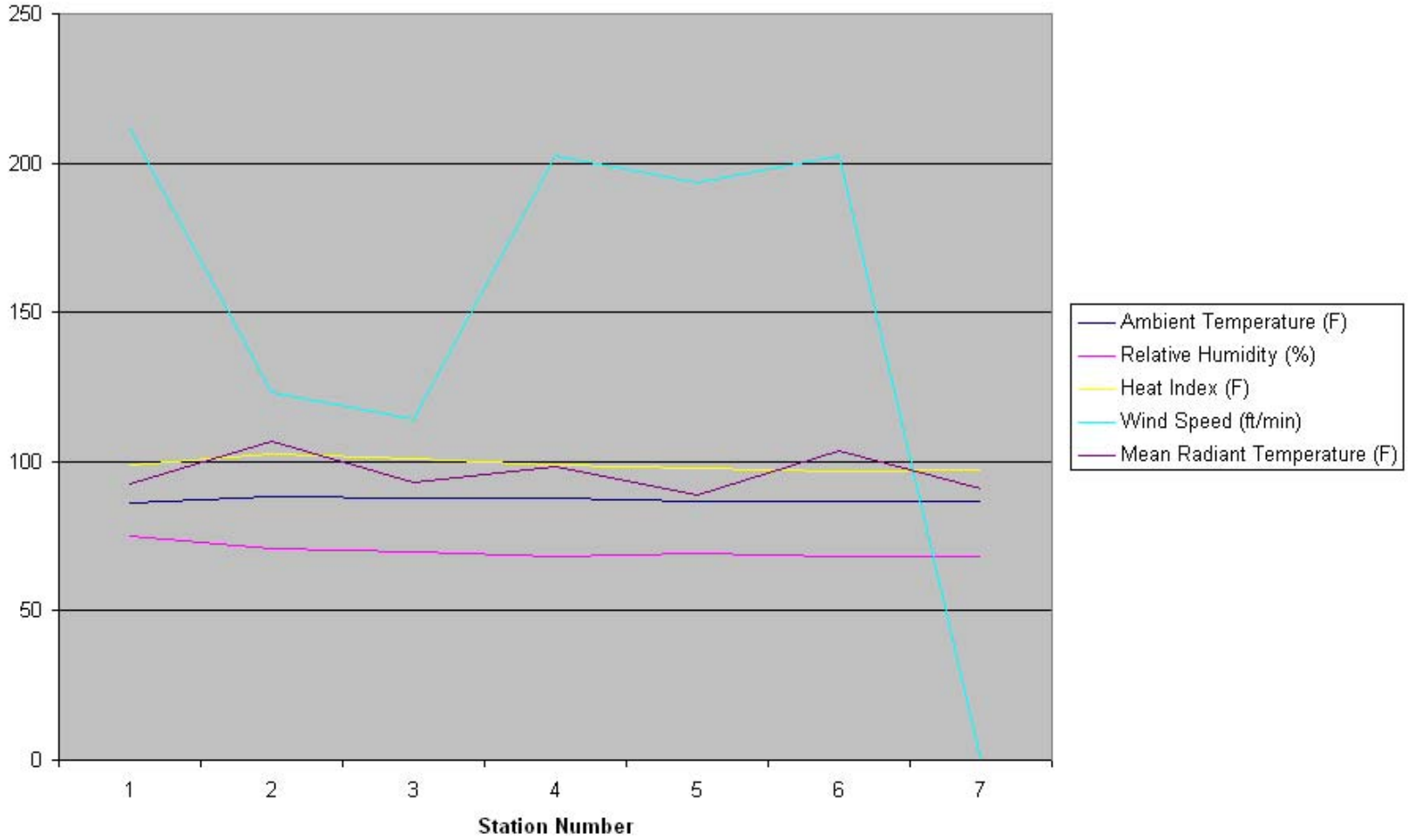
7
Station Number
Ambient Temperature (F)
Relative Humidity (%)
Heat Index (F)
Wind Speed (ft/min)
Mean Radiant Temperature (F)

12:00 p.m. 8/5/05


250
200
150
100
50
0
1
2
3
4
5
6
7
Station Number
Ambient Temperature (F)
Relative Humidity (%)
Heat Index (F)
Wind Speed (ft/min)
Mean Radiant Temperature (F)

Conclusions:

Microclimates prove to be dynamic.

Microclimates are most distinct during the middle of the day.

Microclimates level out when the sun sets.