



# Charleston WBGT Results & Mapping 12/7/2021



# Background: WBGT



1

Dry-Bulb  
Temperature



2

*Natural*  
Wet-Bulb  
Temperature



3

Globe  
Temperature



WBGT

$$WBGT = 0.1 * DB + 0.7 * NWB + 0.2 * GT$$

# Background: WBGT

WBGT Activity Guidelines and Rest/Break Guidelines for Athletes

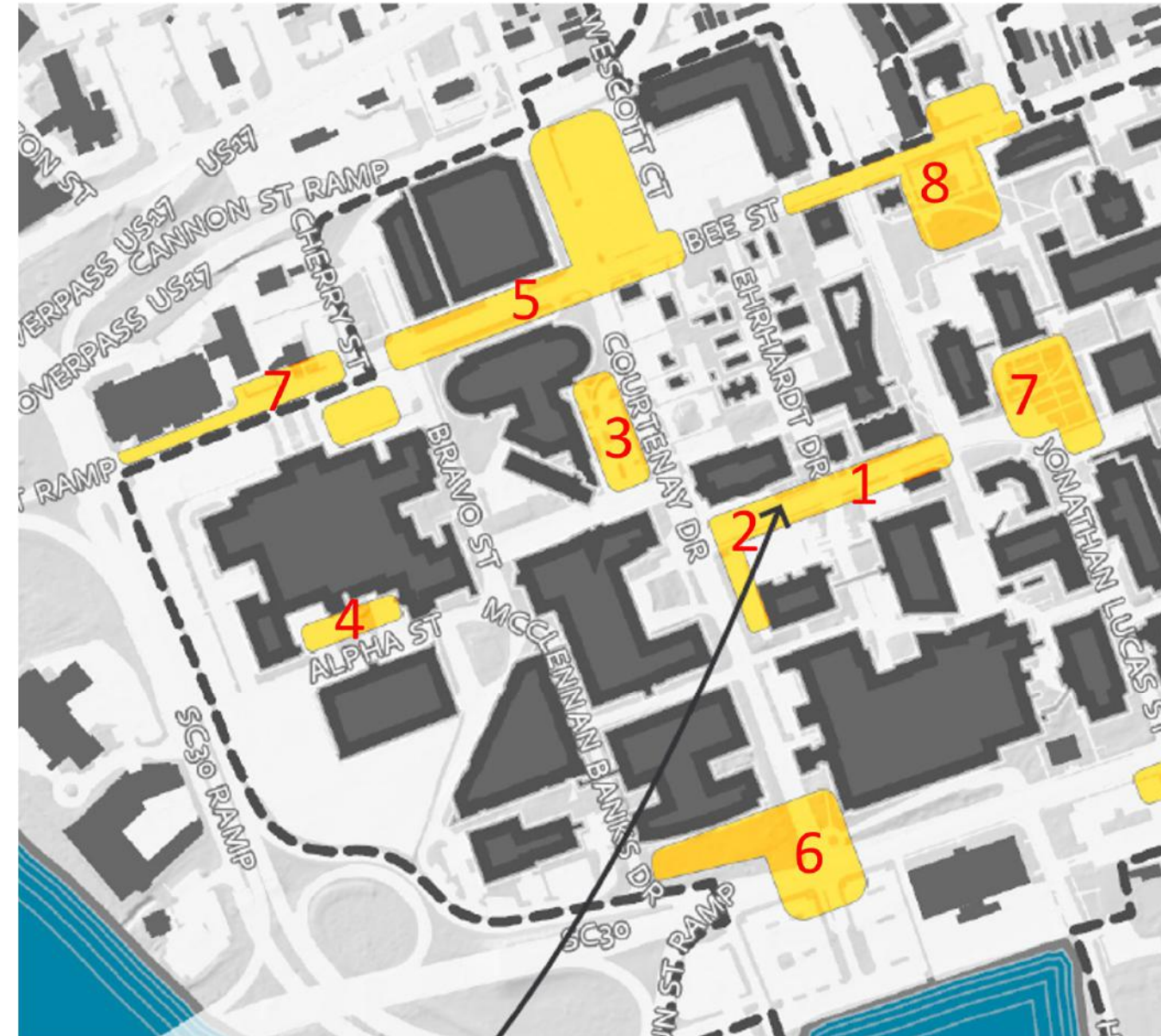
Heat Category	WBGT Index (F)	Activity Guidelines
No Flag	Under 80	Unlimited activity with primary cautions for new or unconditioned athletes or extreme exertion; schedule mandatory rest/water breaks. (5 min rest/water break every 30 min)
Low (Green Flag)	80-84.9	Normal practice for athletes; closely monitor new or unconditioned athletes and all athletes during extreme exertion. Schedule mandatory rest/water breaks (5 min water/rest break every 25 min)
Moderate (Yellow Flag)	85-87.9	New or unconditioned athletes should have reduced intensity practice and modifications in clothing. Well-conditioned athletes should have more frequent rest breaks and hydration as well as cautious monitoring for symptoms of heat illness. Schedule frequent mandatory rest/water breaks. (5 min rest/water break every 20 min) Have cold or ice immersion pool on site for practice.
High (Red Flag)	88-89.9	All athletes must be under constant observation and supervision. Remove pads and equipment. Schedule frequent mandatory rest/water breaks. (5 min rest/water break every 15 min) Have cold or ice immersion pool on site for practice.
Extreme (Black Flag)	Over 90	SUSPEND PRACTICE

In some states, this is 92° (e.g., GA, SC)

Source: North Carolina High School Athletic Association

# Field Work Design

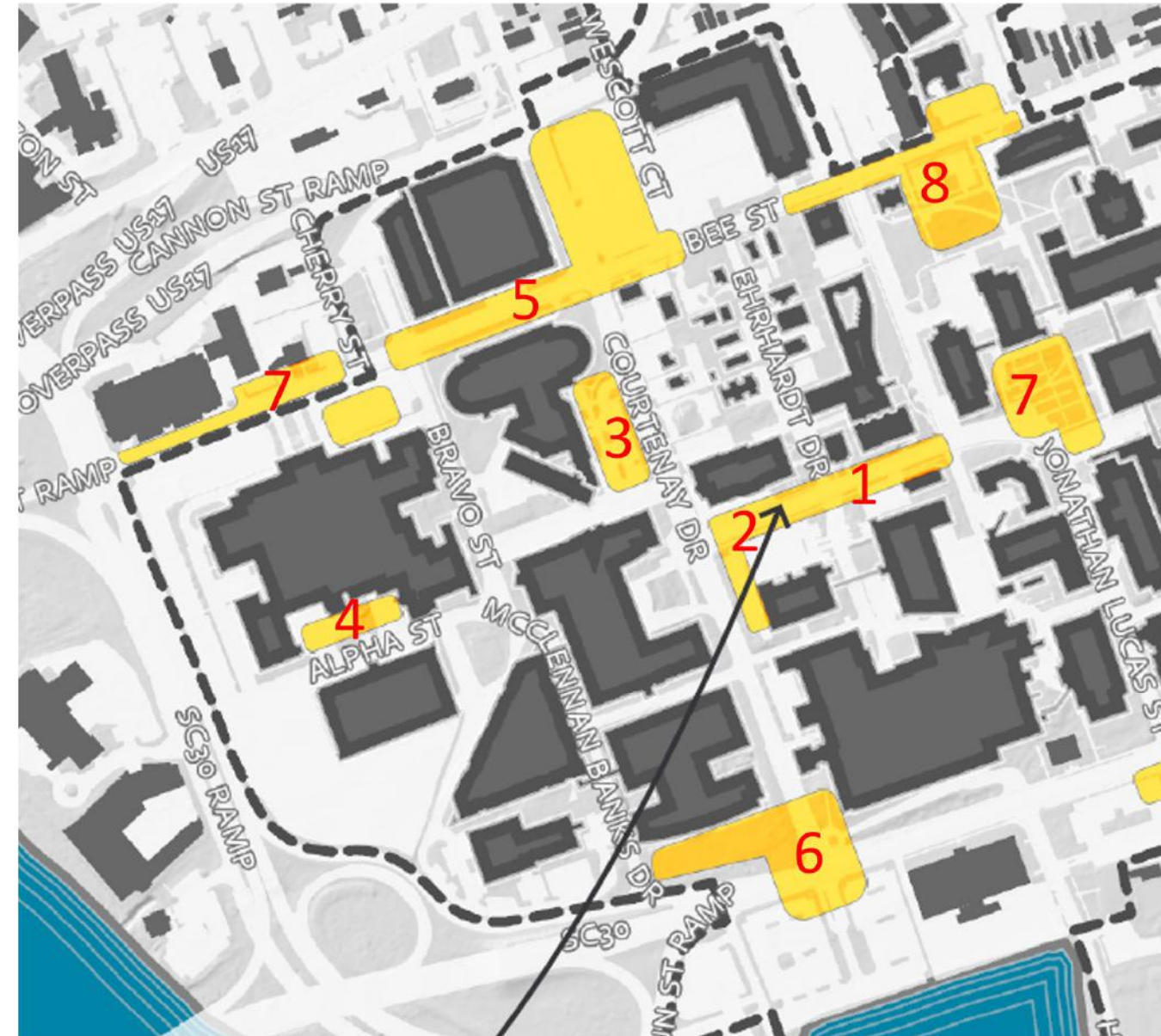
1. Sampling different microclimates within district
  - Respite areas, outdoor workers, transit
2. Recruited volunteers from surrounding universities to measure WBGT with Kestrel 5400s
3. Volunteers also recorded skin temperature and pictures of cloud cover



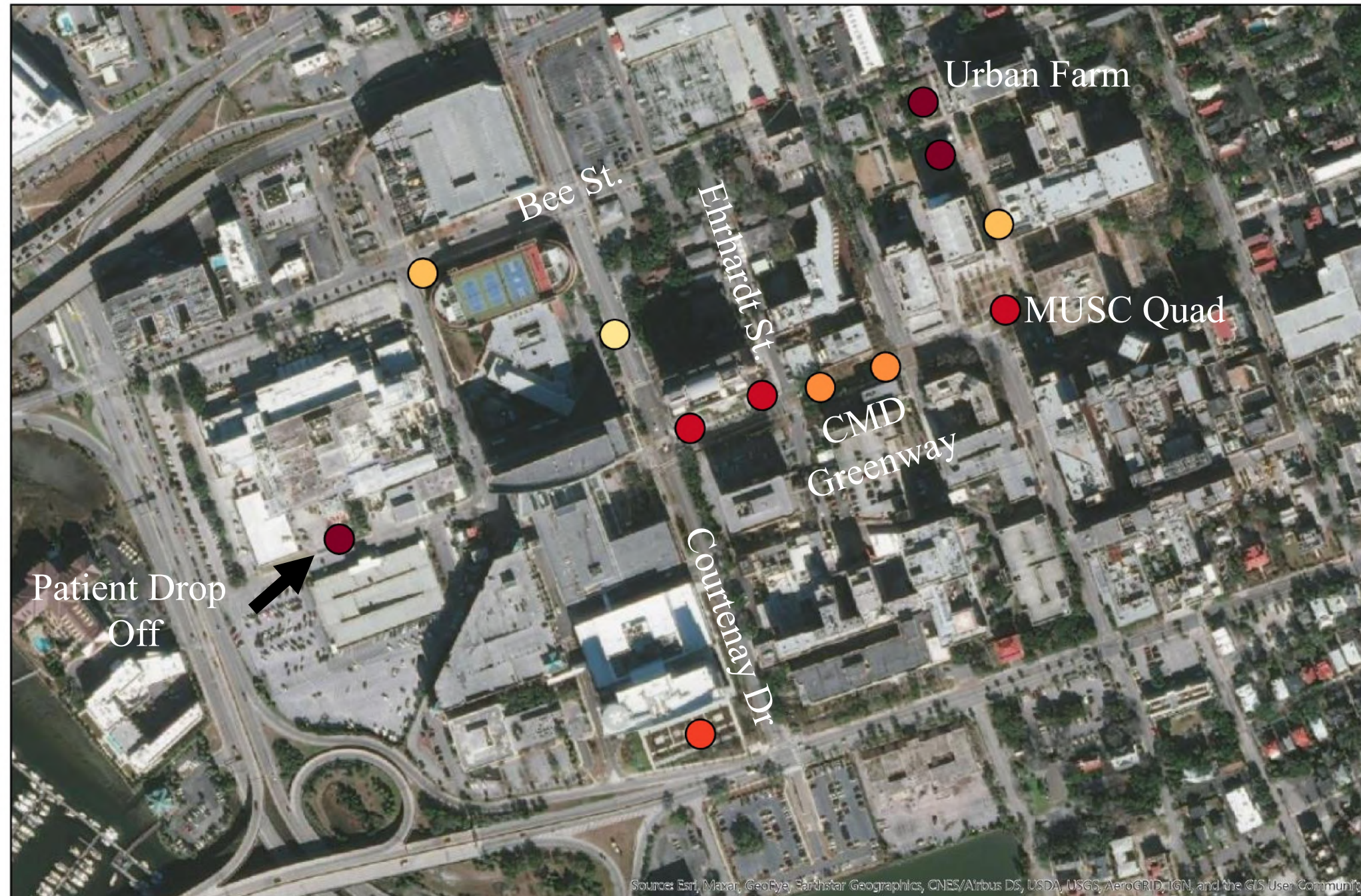
# Field Work Locations

## Respite areas, outdoor workers, transit

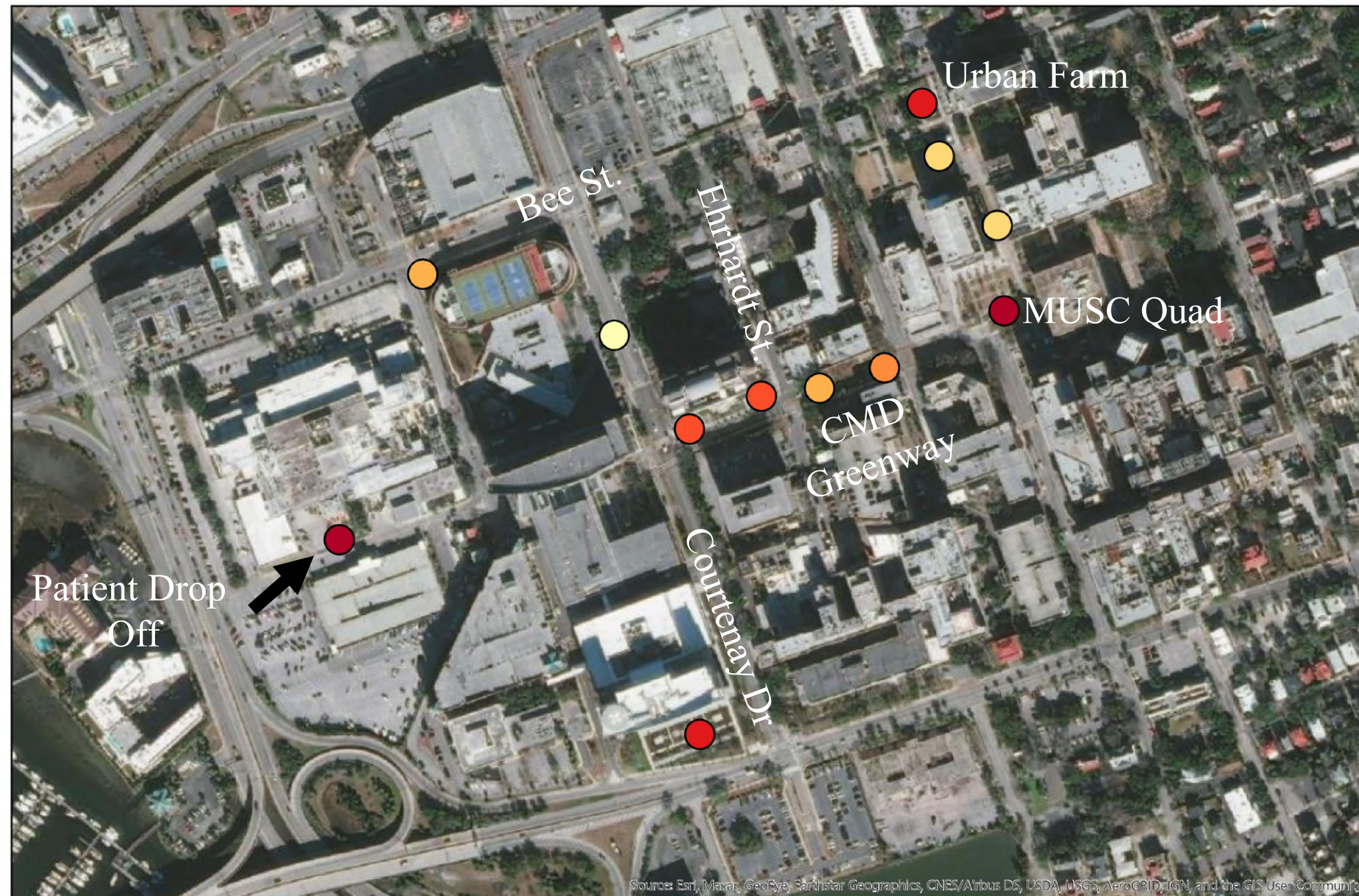
1. CMD Greenway
2. Sitting Area
3. Future bus stop
4. Hospital patient drop off/waiting area
5. Bravo/Bee St. Intersection
6. Children's hospital garden
7. MUSC Quad
8. Urban Farm



# Max WBGT at each location



# Average WBGT Forecast Error (Absolute)



# Max Skin (Surface) Temperature

