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Personal Occupational Temperature Exposure in Thermal Extremes: A Case Study of Grounds Workers in Boone, NC and Raleigh, NC.

Rapid advancements in low-cost wearable sensors are on-going and these technologies provide an unprecedented opportunity to collect continuous and high resolution geo-referenced environmental exposure (e.g., ambient temperature and humidity) and health data (e.g., heart rate) for analyzing individual microclimates in the workplace. The objectives of this research are to: 1.) Employ personal monitoring devices to characterize spatial and temporal variations in cold exposure among outdoor workers; 2.) Examine the occupational, environmental, and behavioral factors that contribute to variations in individual exposure to low ambient temperatures; and 3.) Compare individual-level temperature measurements with ambient temperature monitoring stations. To date, PIs have collected data from January 22 to February 9, 2018 (n=55) and July 18 to August 8, 2016 (n=61) for grounds workers in Raleigh, NC and Boone, NC. Continuous data were collected using wearable sensors to measure ambient temperature, UV exposure, heart rate, and GPS location. Data collection also involved a baseline and daily temperature-related health questionnaire, exit survey, and daily activity measures. Results to date demonstrate workers are modifying their temperature exposure to extreme events, particularly when National Weather Service advisories are issued.