Civil and Environmental Engineering Department

CEE21

H1-4

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Problem Statement

Due to rising global temperature averages, the University of Maryland Office of Emergency Management and Business Continuity tasked our team with creating a decision matrix with protective action to keep University of Maryland personnel safe during a heat emergency.

Project Goal

- Improve safety of the University of Maryland's campus in regards to heat emergencies through preventative measures and emergency response

Project Objectives

- Ensure that campus has information on critical temperature thresholds based on the NWS Heat Index and OSHA brochure for heat safety.
- Reduce the risk of heat related illnesses for UMD personnel through suggested action plans to be implemented by campus leadership.
- Ensure that all campus demographics are included within the response framework provided.
- Offer the University of Maryland office of emergency management three heat emergency solution packages within the price ranges of $0-$1.00 per student, $1.00 to $5.00 per student, and $5.00 to $10.00 per student.

Outdoor Heat Emergency Matrix

Level of Health Concern	Safe	Caution	Extreme Caution	Danger	Extreme Danger
Heat Index Temperature*	<80	80-90	91-103	104-110	110+
Who is Affected?	None Expected	• At risk groups** • Youth	• Individuals who are active outdoors • At risk groups** • Youth	• Everyone	• Everyone
Outdoor Staff	No Action Anticipated	• Consider providing drinking water for outdoor employees • Encourage the use of sunscreen by workers • Ensure adequate medical services are available if required	• Alert workers of high risk conditions • Consider acclimatizing workers • Advise frequent hydration breaks among workers (~4 cups/hour) • Schedule frequent breaks in cool shaded areas • Encourage a buddy system/having supervisors monitor for signs of heat illness • Follow recommendations for "Caution" level of health concern	• Try to limit physical exertion of workers • Consider adjusting work schedule to limit exertion when exposed to the sun or in high heat index • As feasible, watch workers at all times • Follow recommendations for "Extreme Caution" level of health concern	• Alert workers of extreme heat hazards • Mandate a drinking schedule (~4 cups/hour) • Enforce rest schedules for workers • Conduct physiological monitoring • Follow recommendations for "Danger" level of health concern • If stoppage of outdoor work is not possible, ensure access to cooling centers and follow practices above

Indoor Heat Emergency Matrix

Level of Health Concern	Safe	Caution	Extreme Caution	Danger	Extreme Danger
Indoor Temperature (F)	<78	79-83	84-88	89-94	95+
Who is Affected?	None Expected	Everyone, At-Risk Individuals** may be susceptible to earlier onset of health impacts	Everyone, At-Risk Individuals** may be susceptible to earlier onset of health impacts	Everyone, At-Risk Individuals** may be susceptible to earlier onset of health impacts	Everyone
Student	No Action Anticipated	• Consider opening any doors or windows that may decrease the amount of heat within the building • Consider using fans to circulate cool air	• Potentially take measures to not use any devices that may increase indoor temperature • Maintain hydration throughout the duration students are in high temp environment	• Encourage students to remain in temperature controlled environments as much as possible	• Building should be evacuated and closed until temperatures are below 95 degrees
Faculty	No Action Anticipated	• Consider opening any doors or windows that may decrease the amount of heat within the building • Consider hosting hybrid classes for at risk groups	• Consider online lecture platforms • Encourage students to distance themselves to lessen effects of heat • Encourage hydration throughout the duration that faculty are in high temp environment	• Encourage faculty to move classes online	• Building should be evacuated and closed until temperatures are below 95 degrees

Relief Packages

$0-$1.00 per student

Microfiber Cooling Towel ($0.70/u)

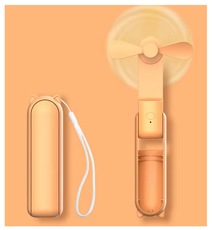
Or

Cold Gel Pack Compress ($0.89/u)

$1.00-$5.00 per student

Insulated Water Bottle ($3.50/u)

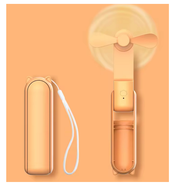
Or



Handheld Mini Fan ($3.67/u)

$5.00-10.00 per student

Complete Package ($8.76/u)



Research was compiled from the following Organizations:

OSHA Occupational Safety and Health Administration

DC.gov

NOAA National Weather Service

NIH

HEAT.gov National Integrated Heat Health Information