EXECUTIVE SUMMARY
Lowcountry Heat Action Plan Toolkit

Introduction

Extreme heat affects our health and our wallets! Preparations for extreme heat include raising awareness, providing coping resources, mitigating heat impacts, and developing adaptation strategies. Working together since 2020, the Charleston Heat Health Research Program -- with partners including The Citadel, South Carolina Sea Grant Consortium, NOAA, NWS Charleston, MUSC, USC, UNC, NC State, Appalachian State, College of Charleston, local governments (Charleston and Mount Pleasant), Climate Adaptation Partners, and community organizations -- developed the Lowcountry Heat Action Plan Toolkit. This toolkit (Lowcountry Heat Action Plan Toolkit) provides essential information about heat-related events and links to resources including community notifications, recommended household preparations, cooling locations and ongoing operational adjustments before, during, and after an extreme heat event.

Heat is Getting Worse

Living on the coast is a double-edged sword. The summertime climate is somewhat moderated by cooling sea-breezes, but the ocean increases the humidity leading to high "feels like" temperatures (based on dew points and temperature). The Lowcountry high dew points mean there is a lot of moisture in the air. Urbanization of the Lowcountry also adds heat; asphalt, concrete, brick, and other human-made materials absorb, hold, and emit heat contributing to the "Urban Heat Island" effect. This effect is also exacerbated by the reduced number of green spaces which help cool the air. In the coming decades, maximum and minimum summertime temperatures are projected to increase globally. For Charleston, the number of days exceeding 90°F would rise and heat waves would be a more common occurrence. Less certain than temperature are the changes in relative humidity and sea breezes. However, extreme heat in conjunction with high humidity and atmospheric instability can lead to pop-up thunderstorms and extreme rainfall, "rain bombs," which can cause flash flooding of our Lowcountry streets.

Heat Alerts

When the heat index (the "feels like temp") exceeds a specified threshold, the National Weather Service issues Alerts (WWA) that are of three levels (1. Advisories: 2. Watches and 3. Warnings.) Advisories are given in anticipation of more certain heat grades; a watch means "be prepared;" a warning means "take action." For Charleston, Heat Advisories will now be issued when heat indices are forecast to reach 108-112°F for at least 2 hours or more; extreme Heat Watch and/or Warnings will be issued when heat indices are forecast to reach or exceed 113°F for at least 2 hours or more. When a Heat Advisory is issued, individuals should consider postponing or rescheduling outdoor activities, especially during the heat of the day. When a Heat Watch is issued, individuals should prepare to adjust their plans accordingly in advance of a warning. When a Heat Warning is issued, individuals should avoid outdoor activities, especially during the heat of the day. In all cases, individuals should drink plenty of water and electrolyte replacement drinks, take frequent breaks in the shade, stay indoors in an air-conditioned space as much as possible and wear loose-fitting, light-colored clothing. It's important to remember that these advisories are based on healthy individuals so those with chronic health conditions should be even more cautious.

Extreme Heat and Health

Heat waves are the deadliest form of extreme weather, and even moderate summer heat can cause serious illness or death by worsening chronic conditions like heart disease or asthma. Heat-related deaths consistently outnumber those from other weather events.

Heat stress occurs when the body's cooling mechanisms cannot keep up with the heat. Stress progresses in three stages: (1) Heat Cramps -- painful muscle cramps and spasms alongside heavy sweating that may lead to heat exhaustion or stroke -- may be the first sign of heat-related illness. (2) Heat Exhaustion is a worsening condition that includes heavy sweating, weakness or tiredness, cool, pale, clammy skin; fast, weak pulse, muscle cramps, dizziness, nausea or vomiting, headache, and/or fainting. (3) Heat Stroke is a potentially fatal condition that includes throbbing headache; confusion; nausea; dizziness; body temperature above 103°F; hot, red, dry or damp skin; rapid and strong pulse; fainting; and loss of consciousness.

Vulnerable groups -- people without air conditioning, those with physical or mental health conditions, individuals facing energy insecurity, young children, older adults, and workers exposed to unsafe indoor or outdoor heat – are especially prone to heat-related illnesses. Moreover, individuals who are outside during extreme heat events could be at risk for burns to the skin from very hot surfaces.

Heat Forecast: What To Do

Individuals can prepare for the heat season using a three-prong approach: 1) planning before it becomes hot (pre-event phase): 2) managing during peak heat days (heat event phase), and 3) analysis after a heat event (post-event phase). In the pre-event phase, try to reduce the amount of heat gain on your home by using shading, insulation and reflective surfaces; review household patterns (use of lights, dryer, oven); designate a "cool room", prepare for power outages; and identify alternatives; and understand the resources available in your community well ahead of events. During the heat event, actively reduce the heat gain in your home by keeping shades closed, adding temporary insulation like solar blankets, and optimizing the use of AC in occupied spaces. For post-event, review what worked and what could be more helpful.

At the community level, preparation is equally important. For example, operations personnel should prepare healthcare workers to respond to patients who have extreme heat exposure; advise outdoor workers to manage their own extreme heat exposure; and engage hospitality workers to help communicate extreme heat risks to visitors as extreme heat is more dangerous to visitors not acclimated to heat like local citizens.

Resources

The Lowcountry Heat Action Plan Toolkit represents the work of many hands who collectively began this effort in 2019 and continue to volunteer time and resources to advance Lowcountry preparedness for extreme heat.

For information on how to participate, please contact CHHRP collaborators at:

- The James B. Near Center at The Citadel: citadelclimate@citadel.edu
- Climate Adaptation Partners: janice@climateadaptationpartners.com

To learn more about available resources, please visit:

- City of Charleston extreme heat news release: City of Charleston Extreme Heat News Release
- MUSC Arboretum: https://web.musc.edu/resources/health-and-wellness/arboretum
- Street Tree Canopy Storymap: https://www.charleston-sc.gov/2677/Tree-Canopy