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'This Was Preventable': Football Heat Deaths and the Rising Temperature



Most states rank poorly on heat safety for their high school football players. Too many teens have paid the price, and temperatures are only getting worse.



BY JAMES BRUGGERS



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©ROwens Photography

As extreme heat becomes more common, high school football players can face health risks if teams aren't vigilant about warning signs and take precautions. Credit: R. Owens Photography/CC-BY-ND-2.0

Laurie Giordano had just arrived after her son collapsed on his high school football practice field in Fort Myers, Florida.

It was June 29, 2017, and she remembers it with painful clarity.

The Riverdale High School teammate who knocked on her car window at the end of a sweaty practice, telling her that her son couldn't get up on his feet. Her son, cradled in a coach's arms, making a slow, repetitive moaning sound, while players poured water in his mouth. The coach saying the player was just a little overheated.

The ambulance arrived, but 10 days later, Zach

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The Flash Drought
Brought Misery,
but Did It Change
Minds on Climate
Change?

BY MEERA

Martin-Polsenberg, a 16-year-old lineman, was dead, a victim of heat stroke. In the ambulance, Zach opened his eyes a few times and squeezed his mother's hands, but that was the last of their communication.

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Through her grief, a shocked Giordano tried to figure out how this could have happened and concluded Zach's high school had not taken the potential for heat stroke seriously.

So she spent the last year trying to convince Florida authorities to tighten their heat-safety rules. Giordano shared Zach's story with the leadership of the Florida High School Athletic Association, but she was only partly successful; the association bucked its own medical advisory committee by voting to "strongly recommend," but not mandate, a first-aid tool experts say could have saved Zach's life—a cooling tub, water and some ice.

SUBRAMANIAN



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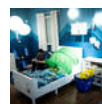
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Summers Are Getting Hotter Faster, Especially in North America's Farm Belt

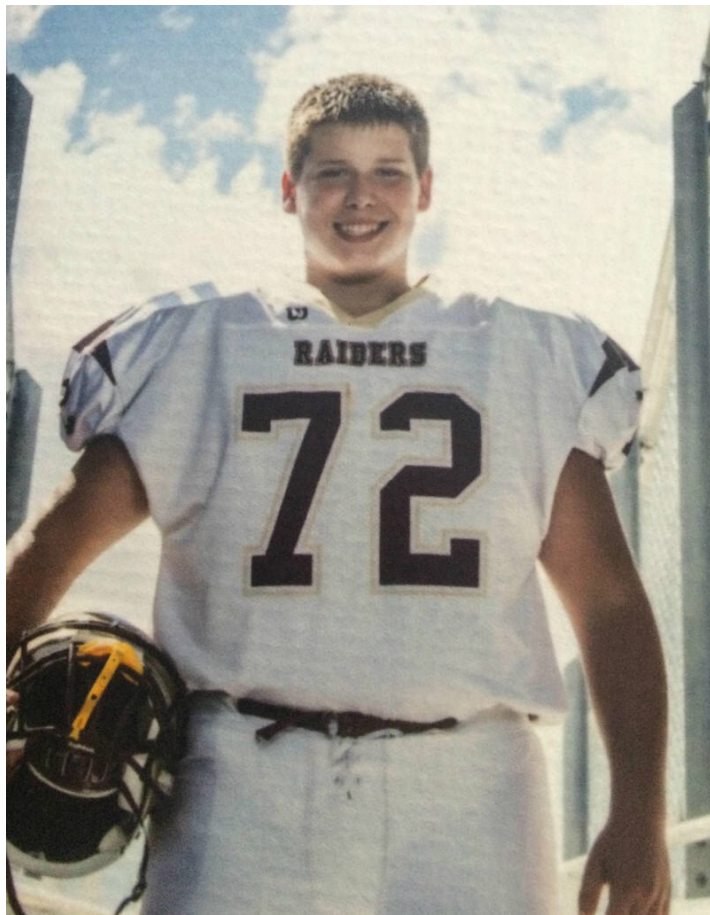
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Nobel-Winning Economist to Testify in Children's Climate Lawsuit

BY GEORGINA GUSTIN

"I felt like I couldn't just sit in my grief and have it happen again," Giordano said. "I don't think I could live with that, knowing that I hadn't done anything to try to make for change."



Zach Martin-Polsenberg. Photo courtesy of Laurie Giordano

Heat stroke can occur in all states. But researchers studying student athletes, especially football players during summer workouts, see more of it in the East, and particularly the Southeast, where sweltering temperatures, high humidity and intense sunshine make for a trifecta of deadly risk, and where high school football is very popular. These weather conditions are only getting



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worse as the climate changes, bringing more heat and humidity.

Just as coastal cities brace for rising seas and communities and farms look for ways to manage heavier rain, there's an increasing awareness that adapting to climate change includes protecting people from heat, including young athletes. Yet a new ranking of states by their heat safety measures for youth sports shows that many states are failing to require simple precautions that could save lives.

"Heat is already a major safety hazard for athletes and the broader public," said Andrew Grundstein, a University of Georgia professor of geography and climate science. "Yet we should still be able to do the activities like sports that we enjoy. Considering that our climate is warming, it is even more important that we have heat safety guidelines and policies. This will help us adapt and be more prepared for the more frequent hot conditions."

Summer Days Are Getting Hotter

Since 1995, three football players a year on average have died of heat stroke, most of them high schoolers, according to the National Center for Catastrophic Sport Injury Research, which **tracks** football injuries and deaths. In the last five years, the average was about two—still too many when these deaths are avoidable.

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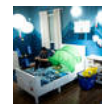
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Heat Waves Creeping Toward a Deadly Heat-Humidity Threshold

BY BOB BERWYN

Max Gilpin, a 15-year-old, was overcome by heat during an August football practice in 2008 at his Louisville, Kentucky, high school. There was no cooling tub there, either, recalled his mother, Michele Crockett.

"This was preventable," said Crockett, who advocates for football safety through the Max Gilpin Beat the Heat Fund.

"What our family went through was horrific," she said. "He struggled for three days in the hospital. We watched all that. We watched as his organs shut down. I never saw him regain consciousness again."

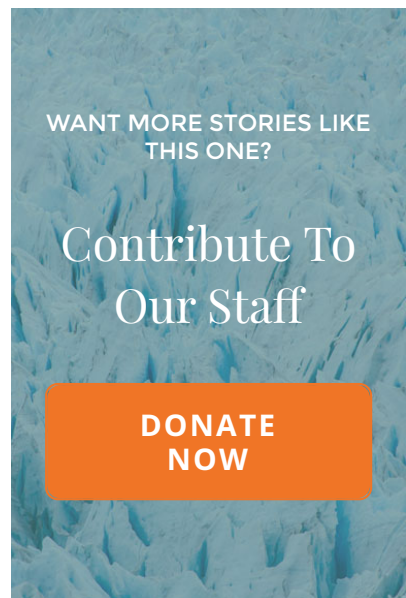
Grundstein has been studying the impact of extreme heat on high school football for several years. He and his fellow researchers **have identified** the players most at risk of heat stroke—the largest ones—and studied the most dangerous practice weather based on a more sophisticated way of measuring heat.

Developed for the military, certain kinds of **heat stress monitors** now recommended for high school football practices take into account temperature, humidity, wind speed, sun angle and solar intensity instead of merely temperature. Heat stress monitors also go beyond the commonly used "heat index," which factors in temperature and humidity to provide the "feels like" temperature numbers commonly used by forecasters and weather apps.



2016's Record Heat Not Possible Without Global Warming, Study Says

BY NICHOLAS KUSNETZ



Heat Exhaustion or Heat Stroke— A Guide

Heat-related illnesses can be life-threatening. The U.S. Centers for Disease Control and Prevention describes the following differences between heat exhaustion and heat stroke and how to respond to each.

The infographic features a central illustration of a football player in a helmet and uniform, with dotted lines pointing to various symptoms. The left side lists symptoms for Heat Exhaustion, and the right side lists symptoms for Heat Stroke. A thermometer icon indicates a body temperature above 103°F. A red box with a warning sign contains the instruction to call 9-1-1. A blue box contains treatment steps for heat exhaustion. The 'inside climate news' logo is at the bottom right.

HEAT EXHAUSTION	HEAT STROKE
Faint or dizzy	Throbbing headache
Excessive sweating	Dizziness, confusion
Cool, pale or clammy skin	No sweating
Nausea or vomiting	Red, hot, dry skin
Rapid, weak pulse	Body temperature above 103°F
Muscle cramps	Nausea or vomiting
	Rapid, strong pulse
	May lose consciousness

CALL 9-1-1

- Take immediate action to cool the person until help arrives

HEAT EXHAUSTION TREATMENT:

- Get to a cooler, air-conditioned place
- Loosen clothes
- Sip water if fully conscious
- Take a cool shower or use cold compresses

SOURCES: National Weather Service; Centers for Disease Control and Prevention

PAUL HORN / InsideClimate News

Southeastern states, Grundstein said, already experience 40 to 60 days when heat stress factors can become extreme enough for schools to stop outdoor practices—roughly a heat index of 103 degrees. In the next 20 to 50 years, Grundstein **expects** an additional 30 days of these conditions in the Southeast, with other parts of the country also affected, but to a lesser yet still significant degree.

"Almost the whole country is going to see a lot more of these days in the summer, and they will extend into the spring and fall," Grundstein said. "In the long term, we are going to see more hot, humid days that are going to pose a

hazard to athletes."

The Southeast was **the slowest** region of the country to heat up over the last century, but that's changing, led in large part by **warmer nighttime temperatures**, said Kenneth Kunkel, a climate scientist and research professor at North Carolina State University and a lead author of the most recent **National Climate Assessment**.

Since the 1980s, nationally, "it's been steamrolling upward, and the story is not different than that in the Southeast. If you look at the Southeast now, since the 2010s, it's actually the warmest period on record."

As global warming continues, Kunkel said, the Southeast's temperatures will rise.

Hydration Is for Survivors

Football's tradition for tough summer workouts despite heat and humidity was described in a 1975 commentary, "Dog Days and Siriasis—How to Kill a Football Player", in the *Journal of the American Medical Association*, by Dr. James P. Knochel of Dallas. An archaic term for heat stroke—siriasis—came from the expression "the dog days of summer," or the time of the year when the dog star, Sirius, rose in the morning with the sun, Knochel wrote.

It was not uncommon, according to the JAMA commentary, to deny players water or to give overweight lineman diuretic pills to help them lose weight by ridding their bodies of **needed**

water and salt.

Wearing full protective gear and helmets in the heat would also toughen up the players, the coaches' believed.

"People thought hydration was for weaklings," said Michael F. Bergeron, an expert on exercise-heat stress who has advised the International Olympic Committee and the Federation of State High School Associations. He recalled **a scene** in the 2000 movie "Remember the Titans" in which the coach played by Denzel Washington tells a player that "water is for cowards."

Hydration helps maintain blood flow to muscles, vital organs and the brain, and assists in sweating, which cools the body, Bergeron said. But in hot, humid weather, sweat does not evaporate very well. So people cannot release as much heat through sweating and are at greater risk for dangerously overheating. Well hydrated athletes can still overheat "if the activity is too hard, for too long, especially while wearing too much uniform and protective gear," said Bergeron, the senior vice president of SIVOTEC Analytics, a sports technology and analytics company.

Heat stroke, with a rectal temperature greater than **104 degrees** and other symptoms, can cause the brain or other organs to swell, possibly resulting in permanent damage or death, **according to the Mayo Clinic.**

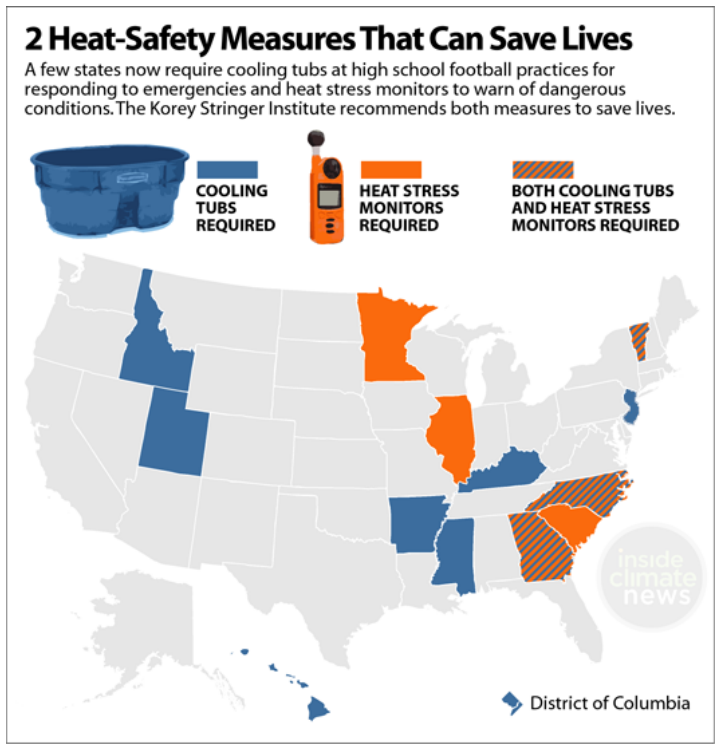
These High School Policies Can Save Lives

If cooling tubs can now be considered climate adaptation, so can other heat-safety recommendations from the Korey Stringer Institute at the University of Connecticut, named for the Minnesota Vikings football player who died from heat stroke in 2001

The institute conducts research and education on how to keep athletes, soldiers and laborers safe from sudden death, including heat stroke.

Last year, the institute published its first health and safety **state rankings** for high school athletes. The institute's experts believe all high school teams should follow certain policies in categories such as sudden cardiac arrest, brain injury and heat, and its rankings are based on whether those recommendations are followed.

When it comes to heat, the institute wants coaches to ease players into summer workouts, limit the use of full gear and the duration of outdoor practices on hot days, and provide three hours of air conditioned breaks when two practices are held in the same day. It stresses the importance of life-saving cooling tubs by allotting three points out of 20 total possible points for states that mandate their use, and it gives more points for heat stress monitors.



SOURCE: Korey Stringer Institute

PAUL HORN / InsideClimate News

Heat stress monitors, which cost around \$100 to \$200, are "the gold standard" and reflect conditions on the practice field, said Samantha Scarneo, vice president of sport safety for the institute. The tubs are the most effective way for teams to bring down body temperature, limit damage and save lives, she added.

"Without a doubt, cold water immersion has a very good cooling rate compared to other previously studied cooling methods, and it is the most feasible," she said.

The Rankings: States and Heat Safety Measures

Using the institute's latest state-by-state safety data, updated on July 19, InsideClimate News

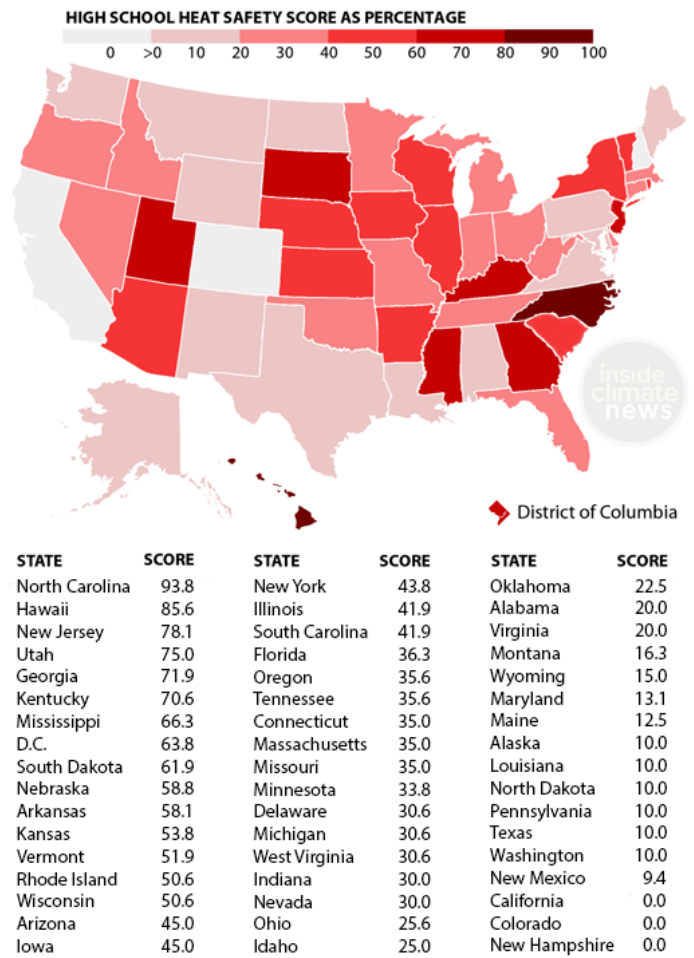
separated out the heat scores and ranked states accordingly.

North Carolina, Hawaii, New Jersey, Utah, Georgia and Kentucky came out on top. Texas, Washington, New Mexico, California, Colorado and New Hampshire were at the bottom.

Thirty-six states received less than half the maximum heat-safety points. Only 12 states require cooling tubs, and only six require heat stress monitors.

Which States Take Heat Risk Seriously for High School Sports?

The Korey Stringer Institute ranks states on high school football safety, including heat risks. The following scores are based on 19 heat safety measures, including requiring cooling tubs, heat stress monitors, air-conditioned practice breaks and policies for easing players into summer workouts and for responding if they show signs of heat stress. No state received the top score of 100 percent.



SOURCE: Korey Stringer Institute

PAUL HORN / InsideClimate News

Georgia, a state that had been considered a leader with its response following a series of heat deaths several years ago, made for a perplexing case. Cooling tubs were first required by the Georgia High School Athletic Association in 2012, and a checklist that goes to coaches includes that. But it is unclear if the measure was ever enforced. Steve Figueroa, a spokesman for the association, said the requirement was left out of its main rulebook and only reinstated recently after InsideClimate

News raised questions about it.

The rankings rankled some state associations and their National Federation of State High School Associations, which **criticized** last year's study as incomplete and flawed by what they saw as a one-size-fits-all approach. "There has never been a time that coaches, athletic directors and school administrators were more focused on risk minimization," the federation said.

Still, the federation acknowledged "room for improvement" and said schools need more funding.

States that don't like the rankings tend to be the ones that haven't scored as well, said Julian Tackett, commissioner of the Kentucky High School Athletic Association. "Anything that brings awareness is good," he said.



Extreme heat can be tougher on football players who aren't accustomed to playing or practicing in high temperatures and humidity. Credit: Phil Roeder/CC-BY-2.0

Grundstein said heat safety policies are important but **should reflect** regional differences.

In the Deep South, players get used to really hot conditions, and that can help them during practices, he said. In northern states, student athletes can be less able to tolerate intense heat because they're not as accustomed to it, he added.

A Dangerous Loophole: Summer Practice

Max's death in Kentucky prompted officials there to make heat awareness training mandatory for all coaches and players—something Florida only required this year after Zach died.

Scarneo, of the Korey Stringer Institute, says Florida has had four high school football deaths from heat since 2010, the most for any state. The Institute wanted the Florida High School Athletic Association to mandate heat stress monitors and cooling tubs, too, she said.

So did the state association's own medical advisory committee.

"We were a little surprised that the board wasn't accepting of our recommendations," said Robert Sefcik, executive director of the Jacksonville Sports Medicine Program, a nonprofit that advocates for youth sports injury prevention, and a member of the

advisory committee. That the association "strongly recommended" heat stress monitors and cooling tubs was a step in the right direction, he added.

Kyle Niblett, spokesman for the Florida High School Athletic Association, would not answer questions about why the association's board of directors had rejected its medical advisory committee recommendations.

Sefcik said association officials were worried that they didn't have legal authority to mandate the purchase of cooling tubs or heat stress monitors and had questions about enforcement and liability. Niblett would only say in an email that the association will inform member schools of all heat safety precautions before fall practices are set to begin on July 30.

That date brings up another Florida controversy.

The association leaves heat safety up to county school districts for summer practices, held before July 30. Zach was in a summer practice when he developed heat stroke.

"It's a huge loophole," Sefcik said.

He said surveys suggest more than 95 percent of Florida high schools have cooling tubs already. But that doesn't mean they always use them.

Zach's high school is an example of that, he said. "The school did have an immersion tub,

however it was in the locker room and not accessible either because it was out of sight or out of mind," Sefcik said. "Nobody thought to utilize it."

Zach's family has submitted a notice of intent to sue the School District of Lee County. Giordano said the family is weighing legal options.

Because of potential litigation, district spokesman Rob Spiker said he was limited in what he could say. But he said Lee County schools will be using cooling tubs and buying heat stress monitors.

That's a start, Giordano said. She is now working with Florida lawmakers to tighten up statewide heat safety rules that were punted by the association.

"I am frustrated they didn't do more," she said. "Even if Zach had lived, we would still be doing this. There is no way he would have let this go by without saying we need to do something. He was a protector."

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James Bruggers covers the U.S. Southeast, part of ICN's National Environment Reporting Network. He came to InsideClimate News in May 2018 from Louisville's Courier Journal, where he covered energy and the environment for more than 18 years. He has also worked as a correspondent for USA Today and was a member of the USA Today Network environment team. Before moving to Kentucky, Bruggers worked as a journalist in Montana, Alaska, Washington and California, covering a variety of issues including the environment. Bruggers' work has won numerous recognitions, including the National Press Foundation's Thomas Stokes Award for energy reporting. He served on the board of directors of the Society of Environmental Journalists for 13 years, including two years as president. He lives in Louisville with his wife, Christine Bruggers, and their cat, Lucy.

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