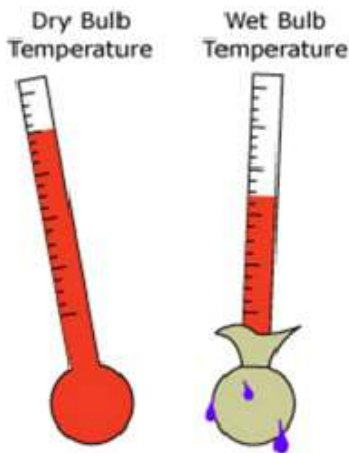




WBGT: The Wet Bulb is the Key

National Weather Service, Little Rock, AR



Have you ever seen a thermometer with a sock on the end? The sock is dipped in water, and the mercury drops depending on how much evaporation/cooling occurs. If it's a dry day, there will be lots of evaporation, and not so much when it's humid. The temperature that's measured is the "wet bulb" reading.

Like the socked thermometer, your body will have difficulty cooling on a stuffy/muggy afternoon or evening when the wet bulb is elevated. Normally, sweating will bring relief, but not this time. Water on your body will have nowhere to go (minimal evaporation), and you will feel uncomfortable. This could pose a problem as long as you keep working and conditions don't change.

Interestingly, it doesn't have to be hot outside for you to be in trouble. Consider a morning when the ambient temperature is 85 degrees. Doing the sock trick, let's say the wet bulb is 80 degrees (little cooling/very humid). Given full sun and no wind, the Wet Bulb Globe Temperature (WBGT) is in the upper 80s. The situation is already becoming dangerous.

While it gets worse as more heat is added, it's not nearly as bad as pumping additional moisture into the air. For every ten degrees the ambient temperature goes up, the WBGT changes a few degrees. That change is at least doubled when the wet bulb rises ten degrees. That's because the WBGT calculation is heavily weighted toward the wet bulb. Heat plays a role, but not as much as the humidity.

	Ambient Temperature	Wet Bulb	WBGT
RAISE TEMPERATURE	85°	70°	82°
10 DEGREES →	95°	70°	85°
	85°	RAISE WET BULB	70°
	85°	10 DEGREES →	80°
			88°

The Korey Stringer Institute (KSI) looked closely at American football heat related deaths in the eastern U.S. According to KSI (associated with the University of Connecticut), many of the reported deaths (roughly 65 percent) happened in August. More than half of these were during morning practice when humidity levels were high.

As pointed out by KSI, it is important to develop guidelines when the wet bulb is elevated and WBGT is going up. The guidelines should include work/rest ratios, length of activity, hydration breaks, equipment to be worn, and a level of WBGT that will cancel the activity.