



WEATHER CONDITIONS AND COMPETITION

PART 1 – BOARD POLICY: LIGHTNING/THREATENING WEATHER

Prior to the start of a contest, the host school is responsible for determining whether or not the conditions present a threat to the safety of participants and spectators and will determine whether or not the contest will begin. Once the contest begins, the officials have the authority to postpone or suspend a contest due to unsafe weather conditions -- that decision may not be overruled. School officials also still have this authority. **On-site medical professionals should also be consulted and included in the decision-making process.** The Superintendent or his/her designee may overrule an official and suspend or postpone a contest once it has begun. In other words, once a contest has begun either the officials or school authorities may postpone or suspend a contest and cannot be overruled by the other party. When in doubt, err on the side of safety.

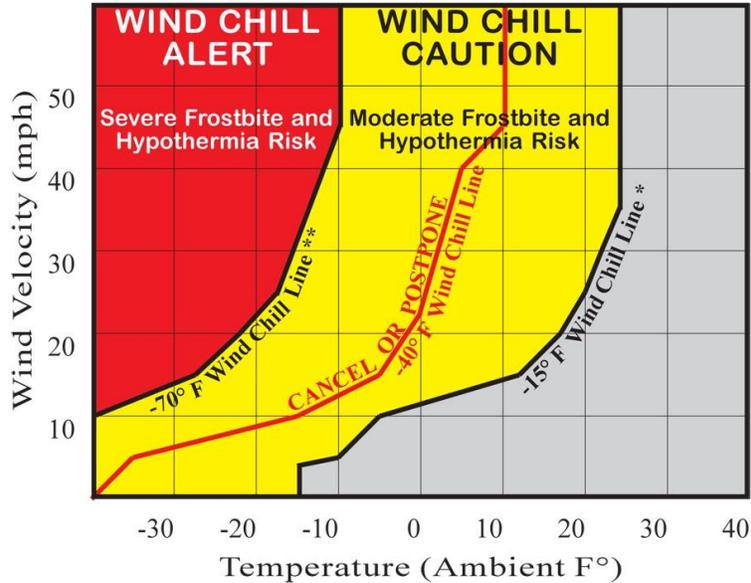
While lightning on the horizon should warn of potential danger, lightning associated with thunder or thunder alone means that there is immediate danger to athletes, officials, and spectators. The adage — "If you can hear it, clear it" — should be used to make decisions to postpone or cancel the activity. Lightning can strike 10 miles ahead of or behind the storm front and thunderhead clouds.

When considering resumption of an athletic activity, the MSHSL recommends that everyone should wait at least 30 minutes after the last flash of lighting or sound of thunder before returning to the field or activity.

Additional lightning-safety guidelines have been developed with the assistance of the National Severe Storms Laboratory (NSSL) and are listed below:

1. As a minimum, NSSL staff strongly recommend that by the time the monitor obtains a flash-to-bang count of 30 seconds (equivalent to six miles), all individuals should have left the athletics site and reached a safe structure or location. Athletic events may need to be terminated.
2. The existence of blue sky and the absence of rain are not protection from lightning. Lightning can, and does, strike as far as 10 miles away from the rain shaft. It does not have to be raining for lightning to strike.
3. If no safe structure or location is within a reasonable distance, find a thick grove of small trees surrounded by taller trees or a dry ditch. Assume a crouched position on the ground with only the balls of the feet touching the ground, wrap your arms around your knees and lower your head. Minimize contact with the ground because lightning current often enters a victim through the ground rather than by a direct overhead strike. **MINIMIZE YOUR BODY'S SURFACE AREA AND MINIMIZE CONTACT WITH THE GROUND! DO NOT LIE FLAT!** If unable to reach safe shelter, stay away from the tallest trees or objects (such as light poles or flag poles), metal objects (such as fences or bleachers), individual trees, standing pools of water, and open fields. Avoid being the highest object in a field. Do not take shelter under a single, tall tree.
4. A person who feels his or her hair stand on end or skin tingle should immediately crouch, as described in item 3.
5. Avoid using the telephone except in emergency situations. People have been struck by lightning while using a land-line telephone. A cellular phone or a portable remote phone is a safe alternative to land-line phones if the person and the antenna are located within a safe structure or location and if all other precautions are followed.
6. People who have been struck by lightning do not carry an electrical charge. Therefore, cardiopulmonary resuscitation (CPR) is safe for the responder. If possible, an injured person should be moved to a safer location before starting CPR. Lightning-strike victims who show signs of cardiac or respiratory arrest need emergency help quickly. Prompt, aggressive CPR has been highly effective for the survival of victims of lightning strikes.

PART 2 – COMPETITION INDEX FOR COLD



CANCEL OR POSTPONE:

- Competitor >1 minute duration at -4°F
- All Activity at -20°F for or at -40° Wind Chill

NOTES:

- * -15°F or greater Wind Chill – Exposed flesh can freeze in 1 minute
- ** -70°F or greater Wind Chill – Exposed flesh can freeze in less than 30 seconds

CURRENT STANDARD FOR ALPINE SKIING

| | |
|---|---|
| ≥ -3 degrees F – (Ambient Temperature) | Check for frostbite on exposed skin. |
| -4 degrees F - (Ambient Temperature) to-10 degrees F – (Ambient Temperature) | Severe frostbite and hypothermia risk. No metal jewelry. Eye protection for frostbite. Windscreen for genitalia. Modify pre race protocol to limit athletes' cold exposure to <30 minutes in duration total time. |
| < -10 degrees F - (Ambient Temperature) or -40 degrees F wind chill | Recommended lower limit for practice and training. Extreme frostbite and hypothermia risk. No exposed skin. Attempt to reschedule event. If competition cannot be rescheduled, a no strip rule will be enforced with all competitors wearing extra layers that include a wind shell for entire body. Modify pre race protocol to limit athletes' cold exposure to <20 minutes in duration total time. |
| < -40 degrees F wind chill | Postpone/cancel competition |

CURRENT STANDARD FOR NORDIC SKIING

| | | |
|-------|--|--|
| Blue | <-4 degrees F - (Ambient Temperature) | FIS** — No competition limit. Severe frostbite and hypothermia risk. No metal jewelry. Eye protection for frostbite. Windscreen for genitalia. Cancel events which are > 1 minute in duration or produce speeds > 10 MPH or if wind is > 10 MPH. |
| Black | < -20 degrees F - (Ambient Temperature) or < -40 degrees F wind chill | Recommended lower limit for practice and training. Extreme frostbite and hypothermia risk. No exposed skin. Extra layers. Wind shell for entire body. |



NWS Windchill Chart

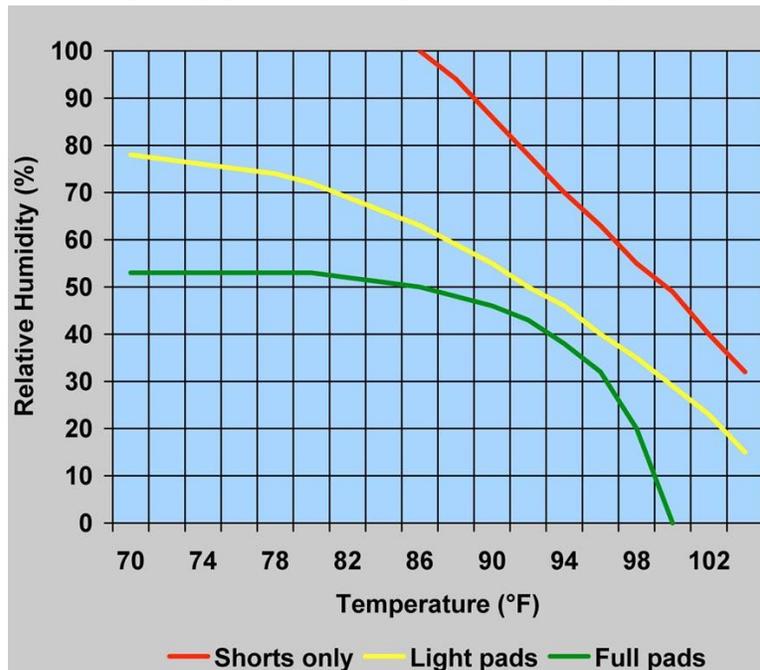


| | | Temperature (°F) | | | | | | | | | | | | | | | | | |
|------------|------|------------------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 | -45 |
| Wind (mph) | Calm | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 | -45 |
| | 5 | 36 | 31 | 25 | 19 | 13 | 7 | 1 | -5 | -11 | -16 | -22 | -28 | -34 | -40 | -46 | -52 | -57 | -63 |
| | 10 | 34 | 27 | 21 | 15 | 9 | 3 | -4 | -10 | -16 | -22 | -28 | -35 | -41 | -47 | -53 | -59 | -66 | -72 |
| | 15 | 32 | 25 | 19 | 13 | 6 | 0 | -7 | -13 | -19 | -26 | -32 | -39 | -45 | -51 | -58 | -64 | -71 | -77 |
| | 20 | 30 | 24 | 17 | 11 | 4 | -2 | -9 | -15 | -22 | -29 | -35 | -42 | -48 | -55 | -61 | -68 | -74 | -81 |
| | 25 | 29 | 23 | 16 | 9 | 3 | -4 | -11 | -17 | -24 | -31 | -37 | -44 | -51 | -58 | -64 | -71 | -78 | -84 |
| | 30 | 28 | 22 | 15 | 8 | 1 | -5 | -12 | -19 | -26 | -33 | -39 | -46 | -53 | -60 | -67 | -73 | -80 | -87 |
| | 35 | 28 | 21 | 14 | 7 | 0 | -7 | -14 | -21 | -27 | -34 | -41 | -48 | -55 | -62 | -69 | -76 | -82 | -89 |
| | 40 | 27 | 20 | 13 | 6 | -1 | -8 | -15 | -22 | -29 | -36 | -43 | -50 | -57 | -64 | -71 | -78 | -84 | -91 |
| | 45 | 26 | 19 | 12 | 5 | -2 | -9 | -16 | -23 | -30 | -37 | -44 | -51 | -58 | -65 | -72 | -79 | -86 | -93 |
| | 50 | 26 | 19 | 12 | 4 | -3 | -10 | -17 | -24 | -31 | -38 | -45 | -52 | -60 | -67 | -74 | -81 | -88 | -95 |
| 55 | 25 | 18 | 11 | 4 | -3 | -11 | -18 | -25 | -32 | -39 | -46 | -54 | -61 | -68 | -75 | -82 | -89 | -97 | |
| 60 | 25 | 17 | 10 | 3 | -4 | -11 | -19 | -26 | -33 | -40 | -48 | -55 | -62 | -69 | -76 | -84 | -91 | -98 | |

Frostbite Times: 30 minutes (light blue), 10 minutes (medium blue), 5 minutes (dark blue)

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})
 Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

PART 3 – COMPETITION INDEX FOR HEAT



HEAT STRESS RISK TEMPERATURE AND HUMIDITY GRAPH

Reprinted with permission from Kulka T.I. Kenney W.I. Heat balance limits in football uniforms, how different uniform ensembles alter the equation. Phys Sportsmed 2002;30(7):29-39.

- **GREEN LINE:** Regular practices with full practice gear can be conducted for conditions that plot to the left of the green line.
- **RED LINE:** Cancel all practices when the temperature and relative humidity plot to the right of the red line, practices may be moved into air-conditioned spaces.
- **BETWEEN RED AND YELLOW LINES:** Increase rest to work ratio with breaks every 20 minutes and all protective equipment should be removed to practice in shorts only when the temperature and relative humidity plot between the red and yellow lines.
- **BETWEEN YELLOW AND GREEN LINES:** Increase rest to work ratio with breaks every 30 minutes and wear shorts with helmets and shoulder pads only when the temperature and relative humidity plot between the yellow and green lines.
- Heat risk rises with increasing heat and relative humidity. Fluid breaks should be scheduled for all practices and increased as the heat stress rises.

- Add 5 degrees to temperature between 10:00 a.m. & 4:00 p.m. from mid May to mid September on bright, sunny days.
- Practices should be modified to reflect the conditions for the safety of the athletes.

Using the heat guidelines

The heat stress graph is designed to give a competition safety estimate in hot, humid conditions. It is most relevant for long distance running and prolonged high intensity events like soccer, football, and tennis. It should be applied to practices and games.

Using a weather radio or local radio station, collect the air temperature and relative humidity data every hour during the event and plot it on the relative humidity vs air temperature graph. In the late spring and summer months on bright sunny days a correction factor of up to 5 degrees Fahrenheit should be added to the air temperature from 10 a.m. to 5 p.m. This should be plotted as a bar rather than a single point to give an estimate of maximum and minimum heat stress.

The decision to cancel or postpone an event should be made when the heat stress moves into the danger range.

Although competition can be continued in the other ranges for increased heat stress risk, coaches and athletes should be aware that hypothermia and exertional heat stroke could occur in the lower risk ranges. Track and cross country runners should stay out of the heat between events and stay well hydrated. A rest break should be provided in activities that require continuous activity like soccer and tennis.

[High-resolution printable color version of Heat/Cold Indexes](#)
[High-resolution printable grayscale version of Heat/Cold Indexes](#)

PART 4 – THERMAL INJURY RISK RECOMMENDATIONS AND FLAG SYSTEM

| Flag | Temperature | Recommendation |
|--------|---|--|
| Black | > 82 degrees F - WBGT* | Extreme High Risk for hyperthermia. No competition recommended. Cancellation should be considered. |
| Red | 73 to 82 degrees F WBGT | High Risk for hyperthermia. Heat sensitive participants should withdraw. Consider slowing pace or intensity of play. |
| Yellow | 65 to 73 degrees F WBGT | Moderate Risk for hyperthermia. Heat sensitive participants should slow pace. |
| Green | < 65 degrees F WBGT | Low Risk for heat injury. Hyperthermia can occur. Hypothermia can occur post-event. |
| White | < 50 degrees F WBGT | Very Low Risk for hyperthermia. Hypothermia risk rises as WBGT decreases. Wind and/or wet conditions increase risk of hypothermia. |
| | < 32 degrees F | Risk of frostbite to exposed skin or areas with poor circulation. |
| Blue | <-4 degrees F - (Ambient Temperature) | FIS** — No competition limit. Severe frostbite and hypothermia risk. No metal jewelry. Eye protection for frostbite. Windscreen for genitalia. Cancel events which are > 1 minute in duration or produce speeds > 10 MPH or if wind is > 10 MPH. |
| Black | < -20 degrees F - (Ambient Temperature) or < -40 degrees F wind chill | Recommended lower limit for practice and training. Extreme frostbite and hypothermia risk. No exposed skin. Extra layers. Wind shell for entire body. Rapid evacuation for injury. |

* WBGT = Wet Bulb Globe Temperature = 0.7 (Wet Bulb Temperature) + 0.2 (Black Globe Temperature) + 0.1 (Ambient Temperature)

** FIS = Federation Internationale de Ski (Adapted from reference 2 and the FIS rules)