

July 26, 2013

DIRECTIVE:	JOB CORPS PROGRAM INSTRUCTION NOTICE NO. 13-01
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TO: ALL JOB CORPS NATIONAL OFFICE STAFF  
ALL JOB CORPS REGIONAL DIRECTORS  
ALL JOB CORPS CENTER DIRECTORS  
ALL JOB CORPS CENTER OPERATORS  
ALL NATIONAL TRAINING AND SUPPORT CONTRACTORS  
ALL OUTREACH, ADMISSIONS AND CTS CONTRACTORS

FROM: GRACE A. KILBANE  
National Director  
Office of Job Corps

SUBJECT: Thunderstorms, Lightning, and Tornadoes

1. Purpose. To provide Job Corps centers with facts and safety precautions to protect students and staff against injuries and/or death from hazards associated with thunderstorms.
2. Background. According to the National Weather Service (NWS), an estimated 100,000 thunderstorms occur in the United States annually. In 2012, thunderstorms and related hazards – including hail, high winds, flash floods, and tornadoes – accounted for more than 167 fatalities, 1,364 injuries, \$4.7 million in property damage, and \$1 million in crop damage.

Thunderstorms occur singly, in bands or in lines, and always include lightning. A typical thunderstorm lasts about 30 minutes. Roughly 10 percent are categorized as severe. A thunderstorm is considered “severe” if it produces hail at least an inch in diameter, or has sustained winds of 58 miles per hour (mph) or stronger. (See <http://www.nws.noaa.gov/om/hazstats/sum12.pdf> for summary of statistics for 2012.)

There are four types of thunderstorms:

- Ordinary cell – a storm short in duration that can produce high winds and hail. Typically it is not severe. Under favorable conditions, an ordinary cell has the potential for microburst winds, usually less than 70 mph, and weak tornadoes.
- Multi-cell cluster – several ordinary cells acting like a single storm. As one cell dissipates, another forms to take its place. Multi-cell storms often result in flash flooding caused by large amounts of rainfall over a small area.
- Multi-cell line (squall line) – storm cells form a straight line that may stretch for hundreds of miles. Storms often last for hours producing strong, damaging winds and hail. Derechos are strong squall lines associated with land-based severe thunderstorms that last for several days and travel hundreds of miles. Derechos or “straight-line” storms produce damaging winds and hail.

- Supercell – highly organized thunderstorms characterized by winds in excess of 100 mph. They produce extremely large hail and strong, extremely violent tornadoes. Supercells are potentially the most dangerous of the four types of thunderstorms. They have the greatest potential for loss of life, injuries and property damage.

Natural hazards associated with thunderstorms include hail, high-wind gusts, flash flooding, lightning and tornadoes. This directive addresses lightning and tornadoes.

## **Lightning**

Lightning is the discharge of atmospheric electricity that is triggered by a buildup of opposing charges within a cloud. Thunder is the sound wave created by the rapid expansion and contraction of the air after a lightning strike. Lightning strikes occur most often during summer thunderstorms. Lightning can also occur during intense winter storms. According to the National Fire Protection Association (NFPA), between 2007 and 2011, local fire departments responded to an estimated 22,600 fires started by lightning. The majority were home fires that resulted in fatalities, injuries, and property damage. Between 2008 and 2012, an average of 9,000 wildland fires started by lightning was reported to the National Interagency Fire Center. Wildland fires started by lightning burned more acreage than fires cause by people.

The National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center issues a thunderstorm watch when conditions are favorable for storm development within a few hours. Local NWS forecasters issue warnings when the Doppler radar indicates that severe thunderstorm activity is occurring or is imminent. At the first sign of lightning or thunder, people should immediately seek shelter indoors. The majority of lightning-strike victims were caught outside during afternoon and evening thunderstorms in the summer months. Lightning-related injuries have occurred indoors when the victim was using a corded phone, near plumbing fixtures, or near/in water during a storm.

## **Tornadoes**

Tornadoes begin to form during initial stage of thunderstorm development. Tornadoes must have contact with the cloud base and the ground. However, the funnel does not have to be visible. Funnel visibility increases as it picks up dust and debris. The lifespan of a tornado can be several seconds to more than an hour. Typically, they last about 10 minutes. Tornadoes break-up when they become wrapped in the outflowing air from the same thunderstorm or a new storm. The “Enhanced Fujita Scale” rates tornadoes based on the amount of damage caused and the wind speeds – which can range from 65-85 mph (F0 scale) to more than 200 mph (F5).

According to NOAA’s National Climatic Data Center, Southeastern and South Central states experience tornadoes in early spring. They occur in Gulf States from February to April. Kansas, Nebraska and the Tennessee Valley region experience tornadoes in late spring. Mid-summer is when tornadoes occur in “Tornado Alley,” which includes parts of Texas, Oklahoma, Kansas, eastern Colorado, Nebraska, and western Iowa. Strongest tornadoes occur in the upper Midwest and Ohio Valley during late summer; the pattern shifts southward in late autumn. Tornadoes have occurred in the winter.

3. Action. To prevent injuries related to thunderstorms, including lightning and tornadoes, center emergency-response plans should include policies and procedures to:

- Suspend outdoor recreation at the first sound of thunder, or when a severe thunderstorm/tornado warning has been issued;
- Ensure that all students and staff report to a designated area until the storm/tornado passes;
- Educate staff and students on activities to avoid during a thunderstorm;
- Educate staff and students on what to do if caught outside during a storm;
- Care for victims of lightning strikes;
- Educate staff and students on what to do in case of a tornado;
- Educate staff and students on what to do in case of flash flood or hail.

The following resources have been provided to assist centers with developing or improving emergency action plans to address weather related events:

- U.S. Federal Emergency Management Administration (FEMA), Plan, Prepare & Mitigate- Before, During and After a Disaster, <http://www.fema.gov/plan-prepare-mitigate>
- NOAA, National Severe Storms Laboratory, “Severe Weather 101,” <http://www.nssl.noaa.gov/education/svrwx101/>
- NWS Storm Prediction Center, Norman OK, “Tornado Safety,” <http://www.spc.noaa.gov/faq/tornado/safety.html>
- U.S. Department of Commerce, “Thunderstorms, Tornadoes, Lightning ... Nature’s Most Violent Storms: A Preparedness Guide,” <http://www.nws.noaa.gov/om/severeweather/resources/ttl6-10.pdf>

Addressees are to ensure this Program Instruction notice is distributed to all appropriate staff.

4. Expiration Date. Until superseded.

5. Inquiries. Inquiries should be directed to Alejandro “Alex” Perez at (202) 693-2825, [perez.alejandro@dol.gov](mailto:perez.alejandro@dol.gov), or Curtis Massey at (202) 693-3096 or [massey.curtis@dol.gov](mailto:massey.curtis@dol.gov).