

## *Hazardous Weather Training*

### **Slide #1**

Welcome to weather smart training. This training course is designed to help you plan and prepare for and then deal safely with hazardous weather conditions you might encounter on a scout outing. Weather smart training is divided into 10 topics or subject areas.

### **Slide #2**

For each topic, you'll experience a short presentation, then answer a question or complete an exercise to show you understand that topic. When you've completed all 10 topics and the assessments, you've earned a personalized BSA Weather Smart certificate of completion. Now if you're ready, let's go get weather smart. Let's start with some question about weather

### **Slide #3 -10**

Questions refer to slides

### ***Slide #11 Weather Planning and Preparation***

### **Slide #12**

All outdoor scouting activities share one thing in common—the weather, be it good, bad or ugly. So, good planning and preparation for the weather can make the difference between a successful outing and a miserable, or even dangerous, experience.

### **Slide #13**

Step one, start your planning by listing the goals of your trip: hiking, overnight camping, swimming, rock climbing.

### **Slide #14**

Next, select your destination—the locations where you'll be, and the type of terrain you'll encounter. Will you be in high mountains, low areas near streams, forests, or grasslands?

### **Slide #15**

Next, check the normal weather patterns and temperature ranges for your locale and time of year. Good sources for this type of information include web sites for NOAA—The National Oceanic and Atmospheric Administration—and for cities or recreational areas near your destination, or weather applications on your smart phone.

**Slide #16**

Then make sure your gear and clothing will prepare you for the weather expected.

**Slide #17**

Finally, the night before you leave, get a projected weather forecast and adjust your plans as necessary. NOAA Weather Radio and the National Weather Service web site are excellent sources for forecasts and hazardous weather warnings.

**Slide #18**

It's also important to have an emergency weather plan worked out ahead of time so every scout knows what to do in case you experience hazardous weather conditions.

**Slide #19**

Include contingencies for canceling the activities as prudent judgment about weather conditions dictates.

**Slide #20**

Monitor changing conditions to ensure good decision-making regarding the weather.

**Slide #21**

The National Weather Service uses a rating system to alert the public about severe weather. Study this chart for a few minutes. FLOOD – Review Slide

**Slide #22**

Tornado – Review Slide

**Slide #23**

Thunderstorm – Review Slide

**Slide #24**

Tropical Storm – Review Slide

**Slide #25**

Hurricane – Review Slide

**Slide #26**

Activity – Review Slide

**Slide #27**    *Lightning*

**Slide #28**

A bolt of lightning as it bursts from a cloud to the ground is one of nature’s most awesome events.

**Slide #29**

Unfortunately, lightning is also deadly. Every year, dozens of people in the U.S. die from strikes.

**Slide #30**

With over 25 million cloud-to-ground lightning strikes a year in the U.S., lightning safety is very important, particularly for scouts during outdoor activities.

**Slide #31**

In scientific terms, lightning is a channel of negative charge, about 1 to 2 inches in diameter, that strikes in less than the blink of an eye. It connects with the highest positively charged object in the area—like a tree, or even a person. Then in a burst of light, a powerful electrical current streaks upward at more than 60 thousand miles per second.

**Slide #32**

So, the smart thing to do is to make sure you are not the highest object in the area, or even standing under or near the highest object outdoors when lightning is possible.

### **Slide #33**

So, here are some basic rules for lightning safety:

First, lightning can strike as far as 10 miles away from a thunderstorm, so anytime you hear thunder, you are within striking distance of lightning. Seek shelter immediately. There's an old saying—"If you can see it, flee it; if you can hear it, clear it." Stay inside until 30 minutes after have passed since the last occurrence of thunder or lightning.

### **Slide #34**

If you are in or on the water, you're likely the highest positive object in the area, and you're also floating in an excellent electrical conductor—so get out of the water and get indoors.

### **Slide #35**

If you are outdoors in a remote area without access to indoor shelter, move off high ground such as ridges and off open ground when you first detect a thunderstorm. Do not stop under an isolated tree, a clump of trees, picnic shelter, bleachers or any object exposed in an open area. Avoid all high or metal objects such as light poles and metal fences.

### **Slide #36**

If the threat of lightning is great, don't huddle in a group; spread out at least 100 feet apart. The electrical discharge from lightning can travel up to thirty yards upon impact, so staying at least 100 feet apart allows you to help others who might be injured after a strike.

### **Slide #37**

If you can get indoors for shelter, be sure to stay away from open windows, metal pipes, and electrical equipment like computers or corded telephones.

### **Slide #38**

You can also take shelter inside a car or truck. Just don't touch metal objects inside.

### **Slide #39**

Getting inside a safe building or vehicle offers the best risk-reduction from lightning. Move quickly when you first hear thunder, see lightning or observe dark, threatening clouds overhead. Stay in a safe area until 30 minutes after you last hear thunder before resuming outdoor activities. A safe building is fully enclosed with a roof, walls, and floor, and has plumbing or wiring. A safe vehicle is a fully enclosed, metal-topped vehicle such as a hard-topped car, minivan, bus, or truck.

**Slide #40**

In the event someone is injured by lightning, they do not hold an electrical charge. So it's safe to give them first aid or CPR.

**Slide #41 - 44**

Interaction – Read Slide

**Slide #45 Cold Weather**

**Slide #46**

Cold weather outings can be fun . . . exciting . . . And, unfortunately, very hazardous if you're not properly equipped and prepared for extreme temperatures.

**Slide #47**

Dramatic cold-weather events such as blizzards and avalanches are very dangerous. But, injuries and deaths also result from the effects of low temperatures and wind chill.

**Slide #48**

Wind chill isn't the actual temperature; it's how wind and cold feel on exposed skin. Wind carries heat away from the skin, so the stronger the wind, the colder it feels.

**Slide #49**

Wind Speed Gauge      Wind chill impacts the feel of the temperature and impact on skin    at 40 Degrees/ 0 Wind it feels 40.

What does it feel like with just 5mph winds?    37 deg

What does it feel like with 10 mph winds?    28 deg

What does it feel like with 20 mph winds?    18 deg

What does it feel like with just 40 mph winds?    10 deg

**Slide #50**

The most common cold-weather dangers are frostbite and hypothermia.

**Slide #51**

Warning signs for hypothermia, or low body temperature, include shivering, incoherence, drowsiness, and slurred speech. If a person's body temperature falls below 95 degrees, seek medical care, if available, otherwise begin first aid treatment.

**Slide #52**

Be sure to review first aid procedures for frostbite and hypothermia before any cold weather trek.

**Slide #53**

There are several steps to ensuring a safe cold-weather outing, including: First, despite forecasts, weather can change unexpectedly, so always be prepared to deal with unusual cold. Your ability to stay warm, or even survive, can depend on having adequate shelter, layered clothing, a reliable heat source, and warm, nutritious food and beverages.

**Slide #54**

So, for any winter outing, it's important to pack the clothing, gear, and supplies needed to survive extreme cold conditions, even if they're not in the forecast.

**Slide #55**

And you may need to review scout literature on techniques for creating snow shelters.

**Slide #56-67**

Questions Review Slides

**Slide #68**    *Hot Weather***Slide #69**

Summertime camping makes you think of carefree days in the sun. But more people die from hot-weather exposure than from cold, lightning, tornadoes, or other weather-related causes.

**Slide #70**

In hot weather, your comfort or even survival can depend on how you deal with the three "h's": heat, humidity, and hydration.

### **Slide #71**

As the air heats up, evaporation is the way your body cools off. Your skin releases moisture in the form of perspiration, and as it dries in the air, it carries away heat. So sweating is your natural air conditioner in dry, hot weather.

### **Slide #72**

But not so well when the air is humid and already saturated with moisture. In these situations, you need to create air movement or find a breezy location, like a lake shore, to encourage evaporation.

### **Slide #73**

Perspiration draws water out of your body, and it must be replaced frequently. Always carry an adequate supply of water and drink whenever thirsty.

### **Slide #74 – 79**

Use Slides to Show Urine Color and need for water

### **Slide #80**

Discuss Items to drop into backpack for hot day

### **Slide #81**

Here are some good tips for dealing with hot weather safely: In other words bring plenty of water with you, bring filters or tablets to treat natural ground water, or hike to a location with a fresh water source. Caffeinated drinks like sodas are mild diuretics, but they will replace more water than they remove. Body salts lost in perspiration need to be maintained, but avoid salt tablets. Wear lightweight, light-colored, breathable fabrics that allow evaporation. Wear a hat for shade and to ward off heatstroke. Use sunscreen with at least a 15 rating. Waterproof products resist sweat, but still need to be reapplied regularly. Lip balm also helps. Polarizing sunglasses are a good idea. Bugs love heat, so bring mosquito netting and 30 percent deet content insect repellent. Sleeping bags should be lightweight—like nylon or just a blanket and sheets. Pitch your tent in the shade. And be sure to review the symptoms and first aid treatment for heat exhaustion and heatstroke before you start the trip.

### **Slide #82 Hail**

**Slide #83**

In addition to lightning, thunderstorms can also bring another serious hazard—hail.

**Slide #84**

Hailstones are formed when updrafts carry ice crystals and super-cooled water toward the top of a thunderstorm.

**Slide #85**

As they grow too heavy to stay aloft, the icy hailstones fall to the ground at high speeds, and often with dangerous results.

**Slide #86**

Hailstones can be somewhat spherical, but often they're irregularly shaped balls of ice and dust. They can range from less than the size of a pea . . . to chunks of ice as large as a softball.

**Slide #87**

The largest hailstone recorded in the U.S. Was more than 18 inches around, and probably weighed more than two pounds.

**Slide #88**

You can see how hail might be a serious hazard when you're outdoors. So it's important to recognize the warning signs of an approaching storm. The best warnings come from current forecasts and weather reports. So monitor them before your outing, and carry along a portable weather radio on your trek, if that's possible.

**Slide #89**

Thunder always indicates danger due to lightning, so if you hear thunder, you should seek shelter. Though scientists aren't sure why, sometimes the sky appears greenish in color as a thunderstorm with hail approaches. But it's not always a dependable sign.

**Slide #90**

Your best shelter from hail is inside a solid structure, and away from glass doors and windows.

## **Slide #91**

If you are trapped outdoors, get under cover, but be cautious about seeking shelter in locations prone to lightning, such as isolated trees or metal bleachers.

## **Slide #92 – 97**

Questions Review Slides

## ***Slide #98 Flash Floods***

### **Slide #99**

A flood is the overflowing of water onto land that is normally dry. It can happen when ocean waves come ashore . . .

### **Slide #100**

when snow melts too fast . . .

### **Slide #101**

when dams or levees break . . .

### **Slide #102**

or, most often, when heavy rains cause a rise in water. A very sudden rise in water is called a “flash flood,” and these can be dangerous because they happen so quickly—usually within a few hours of a rainstorm.

### **Slide #103**

Pouring rain sweeps across a stretch of high desert mountains. Two hours later, a flash flood catches hikers by surprise in a deep canyon many miles below the storm. Not all flash floods involve a wall of water. A sudden cloudburst during a slow, day-long rain in a city suburb can cause water to rise within an hour.

### **Slide #104**

A car and driver attempting a low-water crossing can be swept into danger by shallow rushing water. Intense, heavy rains can often quickly overwhelm drainage systems, particularly in low-lying areas such as an underpass.

**Slide #105**

Never drive into standing water that covers curbs. The water is often deeper than it looks, the car will stall, and rising water can trap occupants.

**Slide #106**

Flash floods can be incredibly powerful, changing a dry stream bed into a boulder-rolling wall of water in an instant.

**Slide #107**

So, if rain is possible, beware of setting up camp in low areas next to rivers or stream beds. When you hike in canyons or other flash flood-prone areas, be aware of weather forecasts far upstream from your location. And, never, never, drive a vehicle into water even if it appears shallow. At a creek crossing, it only takes a few inches of moving water to sweep a car off a road. Cars can also be trapped in low-lying areas.

**Slide #108 – 110**

Interactive Use Slides

**Slide #111 *Tornadoes*****Slide #112**

A tornado is one of the most violent acts of nature, and one of the most frightening.

**Slide #113**

They strike quickly, can destroy homes, and cause major injuries and death.

**Slide #114**

A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. The water droplets in the column make visible the infamous “funnel cloud.”

**Slide #115**

Tornadoes can range in size and strength from huge supercell storms with awesome destructive power, down to small, whirling “dust devils.”

**Slide #116**

The strength of a tornado is rated on the Fujita scale from F-zero, the weakest, to F5, the most destructive.

**Slide #117**

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**Slide #118**

Large tornadoes can spin at speeds in excess of 300 miles per hour, and travel over land at more than 60 miles an hour. Your likelihood of encountering a tornado while camping is seasonal. In the south, it's March through May.

**Slide #119**

Always monitor weather reports for the possibility of violent thunderstorms before leaving on your outing. And carry a portable weather radio with you if possible. Tornado alerts are issued for thunderstorms capable of producing tornadoes. Tornado warnings are given when a tornado has been spotted.

**Slide #120**

If you are outdoors, some warning signs to watch for are the formation of a very dark "wall of clouds;" a rotating movement in the clouds; a sudden stillness and drop in air pressure; a loud, roaring train-like sound; and of course a funnel-shaped protrusion dropping down from a cloud.

**Slide #121**

If there is a tornado warning for your location, or if you see a tornado, these steps could save your life: Get indoors, into a basement or storm shelter. Plan ahead to seek protection at a public shelter if your location, such as a mobile home, lacks adequate structural integrity. A f5 storm can clear a normal home to the slab. If you are caught in a building without a storm shelter, get on the floor against an interior wall, away from doors and windows. Cover yourself with a mattress to protect against flying debris. Do not open windows.

**Slide #122**

If you can't get indoors, avoid seeking shelter in underpasses, bridges and park shelters. They can act as wind tunnels to be ripped apart with you in the debris. And never seek shelter inside a vehicle or try to outrun a tornado in your car.

**Slide #123**

Out in the open, you are much better off finding a ditch or depression, getting as low as you can and covering your face until the danger passes. However, if there is rain with the storm, beware of spots prone to flash flooding.

**Slide #122-127**

Questions Review Slides

**Slide #128-130**

Interactive Review Slides

**Slide #130 *Windstorms*****Slide #131**

When you're outdoors, wind can be a welcome friend, like a cool breeze off the lake on a hot summer day.

**Slide #132**

Or, it can be a nuisance, like the stiff gusts that make pitching a tent a gymnastic exercise, and blow sand into your camp food.

**Slide #133**

But in extreme cases, wind can be a hazard that threatens injury, or your very survival. In extreme cold weather, wind chill accelerates the danger of frostbite and hypothermia.

**Slide #134**

If you're on the water, the waves from high winds can swamp a canoe or boat far from shore.

**Slide #135**

When you're rock or mountain climbing, sudden bursts of wind can literally blow you off the mountain.

**Slide #136**

And in forests or wooded areas, strong winds can knock heavy branches down onto your camp, and even uproot whole trees. Wind safety is really a matter of common sense, using your head, and being prepared for situations where wind might present a danger.

**Slide #137**

Wind Interaction Exercise

**Slide #138** *Traditional Weather Signs*

**Slide #139**

People have been watching the skies and wondering about the weather as long as our species has been on this planet.

**Slide #140**

And over those thousands of years, we've learned a thing or two about signs that predict various types of weather.

**Slide #141**

The scientists and meteorologists among us have developed very sophisticated tools and technologies to determine weather patterns and warn us about approaching danger. Some common weather signs and warnings are worth remembering.

**Slide #142**

A greenish sky can mean hail is on the way.

**Slide #143**

A sudden stillness often precedes a tornado.

**Slide #144**

Large, hammer-shaped clouds indicate building thunderstorms.

**Slide #145**

If you hear a roar of a train, a tornado can be approaching.

**Slide #146**

There's also a long tradition of folk wisdom about the weather, some of which has a scientific basis, and some of which does not.

**Slide #147 – 150**

Questions. Refer to Slides

**Slide #151**

If you are interested in reading more about weather folklore, check the web for additional information. However, be aware that different explanations may be offered for the same phenomena, and not all are substantiated.

**Slide #152 *Hurricanes***

**Slide #153**

Hurricanes strike the U.S. Coastline an average of five times per year, and usually two of those are designated as major hurricanes.

**Slide #154**

Unlike thunderstorms, which can form quickly, hurricanes build up over days, far out in the Atlantic ocean, and are therefore trackable to a large extent.

**Slide #155-159**

Interactions that review Types of Hurricanes

**Slide #160**

Since this module focuses on weather hazards as they relate to scout outings, the most important thing you can do regarding hurricanes is to make an informed decision about whether to conduct the outing based on a watch or warning.

**Slide #161**

A hurricane watch means hurricane conditions are possible in the area within 36 hours. A hurricane warning means hurricane conditions are expected within 24 hours.

**Slide #162**

Common sense dictates that no outing be conducted if a hurricane watch or warning is in effect.

### **Slide #163**

In fact, if the five-day weather outlook indicates a possibility of hurricane activity during the planned outing time, it's a good idea to reschedule.

### **Slide #164**

Should you be on an extended outing and get caught in a hurricane, be aware of the following:

### **Slide #165**

Tornadoes are often spawned by hurricanes. See the tornadoes section of this module for instructions on what to do in the event of a tornado. When the eye of the hurricane passes over, it will seem like the storm has ended, but once the eye passes, the winds will change direction and quickly return to hurricane force. So, do not assume the hurricane is over at the first sign of the storm slackening. Wait a few hours before proceeding. Storm surge flooding from hurricanes actually cause more deaths than the high winds. Stay away from low-lying areas, creeks, streams, and other inland waterways.

### **Slide #166**

After the hurricane passes, avoid weakened bridges and washed-out roads. Stay on firm ground. Moving water only six inches deep can sweep you off your feet. Standing water may be electrically charged from power lines. Watch for closed roads once back in your vehicle. If you come upon a barricade or flooded road, turn around, don't drown!

### **Slide #167**

You can get more information about hurricanes from the National Weather Service web site at [www.nws.noaa.gov](http://www.nws.noaa.gov), or from the National Hurricane Center at [www.nhc.noaa.gov](http://www.nhc.noaa.gov).

### **Slide #168 – 172**

Questions. Refer to Slides

### **Slide #173**

Weather Links

### **Slide #174**

Congratulations