**Introduction**

**Kirsten Barber:** Hi, and welcome to the NCDPS Safety Scoop, a podcast sponsored by the North Carolina Department of Public Safety. There are great people, programs and resources within the department. In each episode of the Safety Scoop, we'll share how NCDPS employees prevent, protect and prepare North Carolinians and help enhance safety in our state. We hope you'll listen along and learn something you may not have known about the largest state agency in North Carolina.

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**Julia Jarema:** Hi, I'm Julia!

**Kirsten:** And I'm Kirsten!

**Julia:** And you're listening to the NCDPS Safety Scoop, a podcast sponsored by the North Carolina Department of Public Safety.

**Kirsten:** NCDPS is the largest department in the North Carolina state government with some amazing programs and resources…

**Julia:** …as well as phenomenal personnel and volunteers.

**Kirsten:** Listen along as we take you behind the scenes and dive into how the people, programs and resources within this department enhance the safety of the people of North Carolina–give you the scoop, if you will, of all things NCDPS.

**Julia:** NCDPS's mission is to safeguard the people of North Carolina through prevention, protection and preparation. As you listen to this podcast, we hope

you'll learn something you may not have known about the ways the people of NCDPS are working to keep our state safe.

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**Season 1 Episode 15**

**Julia:** Welcome back to the Safety Scoop. Warmer temperatures are on the way, but with those temperature changes, we often see an increase in thunderstorms, tornadoes and other types of severe weather during the spring months. Today on the Safety Scoop, we'll talk with two meteorologists from North Carolina Emergency Management about various types of severe weather we experience in North Carolina and what you can do during and before those storms to stay safe.

Kevin Kalbaugh is a graduate of North Carolina University's meteorological program. He joined North Carolina Emergency Management in 2016 as a meteorologist and natural hazardous planner and now serves as the Natural Hazards Branch Manager. Prior to joining the department, Kevin worked at a private company issuing weather forecasts for energy, aviation and agricultural industries across the country and around the world. Laura Silver is a Pennsylvania native and Penn State graduate also with a Bachelor of Science in meteorology. She joined the department earlier this year after working with York County, Pennsylvania Office of Emergency Management. So, welcome! Thank you for joining us today.

**Kevin Kalbaugh:** Hello! Thank you for having us.

**Laura Silver:** Yes, thank you.

**Kirsten:** Let's kick off by talking about what is severe weather? What kind of weather is considered to be severe, and can you take us some of the main hazards that we see in our state and primarily in the spring?

**Laura:** So, when we talk about Severe Weather Preparedness Week, we are primarily talking about the weather hazards we see greatest in the spring and into the summer. So, this includes thunderstorms, tornadoes and heavy rain. Now, there is a difference between a typical thunderstorm and a severe thunderstorm, and what classifies thunderstorms as severe is when they produce hail at least an inch in diameter, it has wind gusts of 58 miles per hour or stronger or produces a tornado. And now, sometimes these severe thunderstorms can have multiple of these factors as well.

So, thinking about the tornado aspect of them, these are actually considered nature's most violent storms, and the reason for this is, is because they can have winds up to 300 miles per hour and damaging paths that can be in excess of one mile wide and 50 miles long. And what makes tornadoes so dangerous is that a lot of times they're very hard to give advanced warning for. So, if you think about a hurricane or a winter storm, those are things we can predict, you know, a few days in advance and give people a warning, and this is typically not the case with tornadoes. They often develop so quickly that it's really impossible to give advanced warning for them, so sometimes these warnings will come and then minutes later these tornadoes are hitting the ground, not giving people much time to prepare for them.

Another hazard we see with the severe thunderstorms is lightning. Now, a good rule of thumb is if you can hear thunder, lightning is close enough to strike you which not a lot of people realize. And all thunderstorms can be dangerous as they do all produce lightning. Lightning will often strike outside the area of heavy rain, and it can strike as far as ten miles from any rainfall. And just a number to keep in mind is that 400 people are struck by lightning each year in the United States, and on average 41 of these people are killed. And that's why

it's so important just to get these facts out there and educate people on these severe storms because a lot of times these situations could be avoided.

Another hazard we see a lot of times with these severe thunderstorms is heavy rainfall and flash flooding, and flash flooding with severe thunderstorms is very similar to tornadoes, as it can be very hard to predict. As we see with hurricanes or tropical systems, that flooding is a lot easier for forecasters to predict where that will fall, and that's not the case with these severe thunderstorms because the flash flooding is so isolated in nature. So, once again, that makes it very difficult for forecasters to give advanced warning to these people where this heavy rain is going to fall. Basically, what the flash flooding is, is the rainfall rates are so great that the ground can only soak up so much water, so once you exceed that amount it starts to run off, and that's when those creeks…and you'll see the roads flooding. So, a good thing for people to remember during this is, "turn around, don't drown." You see water on roadways, try to avoid it the best you can.

**Kirsten:** Those rhymes come in handy when it comes to safety of any type. And something that we've also heard when it comes to lightning safety is, "when thunder roars, go indoors." And that's just a great reminder that, like you said, lightning can strike ten miles away from the rain area in a thunderstorm, so even places that may not have cloud cover yet when a thunderstorm is approaching. Very important to keep in mind.

**Laura:** Yeah, absolutely, and that's why I think it's so great when we see, you know, forecasters or whoever it is getting out these–these little, you know, rhymes out there because it's much easier for people to remember in their heads in the long run.

**Kirsten:** Now that we know the different types of severe weather we can see in North Carolina, is there a severe weather season? Kind of like we have hurricane

season in summer that stretches into fall, is there a severe weather or tornado season for North Carolina?

**Kevin:** So, we can experience and have seen tornadoes and severe storms during any month of the year; however, typically the threat of tornadoes and severe storms is greatest in the spring. We typically have our peak occur in April and May when about one third of our tornadoes occur. The threat of severe storms, it does remain elevated throughout the warm summer months. However, those severe storms are a little more isolated in nature, and we typically don't see those widespread severe weather outbreaks in the summer like we do in the spring.

Later in the year, we also see another uptick in the number of tornadoes during the fall, and that's partially related to tornadoes in tropical systems, either those making landfall in the east coast of the United States or even tornadoes with tropical systems moving northward out of the Gulf of Mexico. Now, time frame during the day, we typically see our most active severe weather for the day during the late afternoon and evening hours. However, we see most of our deadliest tornadoes occur overnight when people are sleeping and less likely to know a tornado warning has been issued.

**Kirsten:** That's a great point, and I think that's a reminder of why it's so important to have those emergency alerts set up on your phone or through another device which we will speak on later. But let's talk about some severe weather records in North Carolina. Do you guys know if there was a day that North Carolina saw the most tornadoes or set a record for the most tornadoes in a day?

**Kevin:** So, I was in Raleigh at the time. I think most North Carolina citizens will–will remember April 16th, 2011. There were 30 tornadoes in the state that day and several were long-track and strong tornadoes. That day, unfortunately, we saw 24 fatalities and over 300 injuries reported. And then in more recent memory, I know this past year has been a blur, but last April 13th we experienced 16

tornadoes, and that's also one of the larger tornado outbreaks the state has experienced in the past 50 years. However, last April, most of those tornadoes occurred in the morning, which is a little odd, but also a reminder it could've been much worse if that system would've moved through later in the day during the afternoon or evening hour, if more daytime heating would've allowed more instability. However, most of those tornadoes occurred in the morning and were generally EF1 or EF0s. So, a little on the weaker end. So, a little further back further back in history, the state's deadliest tornado outbreak occurred in March of 1984. That was a–a large tornado outbreak across the southeastern United States. North Carolina experienced 40 fatalities with 14 tornadoes on that day.

The state has never recorded an EF5 tornado which is the strongest tornado on the Enhanced Fujita Scale, but there have been several EF4 tornadoes, most of those occurring during the spring, and we have experienced two strong EF3 tornadoes recently with one in Bertie County during Hurricane Isaias and then in Brunswick County this past January. And unfortunately, both of those tornadoes resulted in fatalities.

**Kirsten:** So, what about thunderstorms?

**Kevin:** When it comes to memorable severe thunderstorms, we have experienced derechos in recent memory, and a derecho is just a long-lasting, widespread windstorm associated with a line of thunderstorms. So, in April 2011, just prior to that large tornado outbreak, there was a derecho with widespread, strong wind gusts and downed trees and power lines across the entire state. When we see those strong wind gusts, many times damage can look like a tornado went through, but it was just straight-line wind damage. But that's just a reminder that strong wind gusts can be just as damaging as some tornadoes.

**Kirsten:** Have there been any other noteworthy severe weather phenomenon or records set in North Carolina?

**Kevin:** So, large hail isn't as common in North Carolina as it is in the plains or Rocky Mountains, but we have had several large hail events in recent years. Hail can be very costly, as they can cause extensive damage to cars and also the roofs of homes and buildings.

**Kirsten:** And Laura, how can North Carolinians stay updated or informed about weather events throughout the state?

**Laura:** So, there are an abundance of ways to get weather information. I like to say there's a way for everyone out there depending on how you like to receive your information. Probably the most common way that people know is through the internet, social media and the news. The National Weather Service, they have social media accounts, and they have websites, so that's a great way to get your information. And other social media accounts, I know local broadcasters, they all have social media accounts that they post weather updates on. And us here at North Carolina Emergency Management, our weather updates daily go onto our Facebook page. That's just another way you can get weather information. And then by watching your local news, you know, evening, morning, whatever you like, you can get the weather information there. And there are an abundance of weather apps. Just by searching your phone's app store, you can see how many there are. Some are more popular than others. You know, we'll see big names like The Weather Channel or AccuWeather on there, but there are also some smaller, private ones you can get as well.

Another way to get weather information is also through the NOAA weather radio. So, what this is, is a nationwide network of radio stations, and they broadcast continuous weather information from the nearest National Weather Service office. They do broadcast 24 hours a day, seven days a week, and they will send you an alert when an official watch or warning is issued for your area. They are very affordable. You can get one for under $40, and you can find them

at pretty much any store nowadays: Walmart, Target, Lowe's. I've seen them everywhere, so very easy to find as well.

And then a third way is you can have emergency alerts enabled on your cell phone or mobile device, and this allows you to receive alerts about weather without needing to download any type of app or subscribe to a service. So, a lot of people have probably already witnessed this with Amber Alerts. It's the same type of messaging that comes through. And you should always follow the instructions in these messages. A lot of times, you know, if it was a tornado warning or something like that, it will tell you, you know, to seek shelter immediately, and those are very good messages to follow.

**Kirsten:** What's the difference between a thunderstorm warning and watch, and how should people respond to these?

**Laura:** I like to think of it as baking cookies or baking cupcakes, something like that. So, if you think of a watch, it's like before you bake the cookies. So, you have all these ingredients out, and you have everything there to prepare these cookies. We can compare that to the atmosphere when a watch is issued. All the ingredients, the atmospheric ingredients, are there for whatever particular type of weather phenomenon that could form, you know, whether that be all the ingredients are there for a tornado or a severe thunderstorm. So, this time you should be aware, and you should be taking precautions to be ready if that watch becomes a warning. And then a warning is like when you have the cookies, they're in the oven, they're already together, and you pull them out and they're done. In this case, comparing it to the atmosphere, that weather phenomenon is either occurring, imminent or likely, and this is the time when you should be seeking shelter or following whatever safety recommendations are being put out there.

**Julia:** That is great information. And now we've talked about a lot of the dangers and what you should be aware of, how can people stay during severe weather, and

are there different things that they need to do, you know, to stay safe in lightning versus tornadoes or severe storms? Laura, can you tell us a little bit about what we can do to protect ourselves?

**Laura:** Absolutely. So, I'm going to kind of break it up with lightning and severe storms and then tornadoes. The best place to be during a tornado or thunderstorm is inside, ideally, in a basement or a storm cellar. However, if you don't have a basement or a storm cellar, the best place to be is just the lowest level of the building, and if there is no basement, you want to go to the center of an interior room if possible, or at least away from any doors, corners and windows. Especially if you are under a tornado warning or watch, you want to get under a sturdy table with your arms covering your head and neck.

Now, obviously, that's not always possible, and depending on if it's a tornado or a thunderstorm, there are some different tactics you should take if you are, say, outside or in a car, so I'm going to break it up that way. So, as I mentioned, you know, tornado, best place basement to be in. Cover yourself with some type of sturdy desk and cover your head with your arms. Now, if you do find yourself in the position that you are in a car or outside during a tornado, which this is never a safe situation to begin, but there are some decisions you can make to better your situation. So, one is if you're in a car, you can try to drive to the closest sturdy shelter if possible. But they do suggest if your car is hit with flying debris as you drive, your safest bet is to just pull over, park, and cover your head with any type of cushion you have.

Another way you can help better your situation if you're stuck outside in a tornado is to try and find some type of low-lying area such as a ditch to lie in, and once again, you want to cover yourself with whatever type of cushion you have available. I do want to mention, because I know it's been kind of a topic of controversy in the past, that you do not want to get under a covered bridge or overpass. That's probably one of the worst places you can be during a tornado. And it's always important to remember that you don't want to try to outrun a

tornado in an urban or congested area in a car. Your best bet is always your car for a shelter.

Now, thunderstorms are a little bit different if you're caught outside in them. One of the biggest things you want to remember is, first and foremost, if you are inside during a thunderstorm with lightning, you want to stay off any type of electricity. You want to stay off, you know, corded phones, computers. And if you are outside in a thunderstorm, this is where if you have the option, you know, to be outside or be in a car, it's actually better to be in your car in a thunderstorm. You just want to make sure the windows are up, and you do not want to touch any type of metal in the car. This is where electricity could travel through, so, for example, if you find yourself caught in your car in the middle of a thunderstorm, you don't want to try and turn your key on in the ignition or anything like that. And then worst case, if you really don't have anywhere to go and you are stuck outside in a thunderstorm, you want to stay away from any type of water, anything that conducts electricity, and you want to get away from the higher elevated areas, so you don't want to be anywhere near hills or mountain ridges or peaks or anything like that.

**Julia:** So, I think that's really useful, and I know for a lot of people without basements that inside location may be a bathroom or a pantry or something like that.

**Laura:** That's very true, and another good point to mention, when you said, "bathroom" is they even suggest if, you know, you don't have a basement or anything, a good place is to, you know, duck in your bathtub, and hide there during the tornado or whatever the watch may be.

**Julia:** Great, that's very good information. Well, I know normally around this time of year we're practicing tornado drills at school, at work, at home. Are there any changes this year due to COVID? Obviously, life is very different right now because of the pandemic, so what would we tell people to do about tornado drills?

**Kevin:** That's a great question, and we do encourage everyone in the state to participate in a tornado drill. However, we know it's probably going to look different this year given COVID. If practicing the drill with others, we recommend you keep your mask on and maintain social distance. If you're in a large building, such as a school or an office building, not everyone has to do the drill at the same time. You could do that drill in waves to help create more spacing, so everyone can have social distance. If there's just no way of maintaining social distance, you don't actually have to practice the drill itself. You could rather utilize that time to review your emergency plan or discuss where to go during a tornado. And just a reminder, you can always practice at home. Talk to your kids and family about where to go during a tornado. If you have those conversations early and discuss where to go, it would be less scary during an actual event.

**Julia:** Well, we've talked a lot today about what to do to be safe, how to be aware of what types of storms there are. Are there any steps that we can take beforehand to protect ourselves or to protect our homes from severe weather?

**Laura:** There absolutely are, and one of the best things you can do to prepare for this type of weather is to make some type of family emergency and communications plan. So, you just want to have some type of sit-down with your family and talk about how will you contact each other if you were to get separated during one of these events? 'Cause you know severe thunderstorms, tornadoes, they can happen anytime. And you never know where you'll be during that time and if you'll be separated from your family. You may want to talk about a type of meeting place you want to have if you were separated. And then just what kind of precautions you're going to take in each disaster that we experience. What are you going to do for a tornado? What are you going to do for a severe thunderstorm?

Readync.org has made it simple for you to make a family emergency plan. They have a downloadable family emergency plan, and all you have to do is fill out the sections before printing it or emailing it to your family or friends. So, this is a great basis if you're not really sure where to start with your emergency plan. It can kind of serve as a template for you to create one. And then following up with that is you want to practice your plan with your family. The more you practice and know what you're going to do in the case of that emergency, the more prepared you're likely to be.

Other than that, you just want to stay informed. When severe weather is going to hit, you know, keep up with your weather alerts and the ways we talked about you can get weather communications. You want to keep up with that on a daily basis, especially during those severe weather seasons like we talked about in the spring and summer. You should always be prepared. Obviously, severe weather can hit any time of the year. You should also be researching what you should have in your emergency kit and create one accordingly. So, with severe thunderstorms or tornadoes, these type of things can knock out power for days, and it's always good to have things like non-perishable foods, water and flashlights on hand. And you want to have those in a spot where both you and your family know where to get those. It's also important to have a to-go bag near your front door, and this could include things such as important documents, a change of clothes, et cetera, just in case you did have to make a quick evacuation.

**Conclusion**

**Kirsten:** Thank you for joining us on the Safety Scoop. As we've seen already this year, severe weather like tornadoes, thunderstorms and lightning can strike at any time, so it's vital to know what to do before and after a storm hits. Severe Weather Preparedness Week typically falls around the start of Daylight-Saving Time. Now is a great time, if you haven't already, to review your family

emergency plan, update your emergency kit by trading out clothes and expired food supplies, check your smoke alarm and carbon monoxide detector and make sure that there are updated batteries in them. Learn more about North Carolina's severe weather hazards at readync.org. Thank you for listening, and stay safe.

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**Julia:** Thanks for listening to this episode of the Safety Scoop. To learn more about NCDPS, go to ncdps.gov. Tune in next time on your favorite podcast app to hear more behind-the-scenes stories from the North Carolina Department of Public Safety.

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